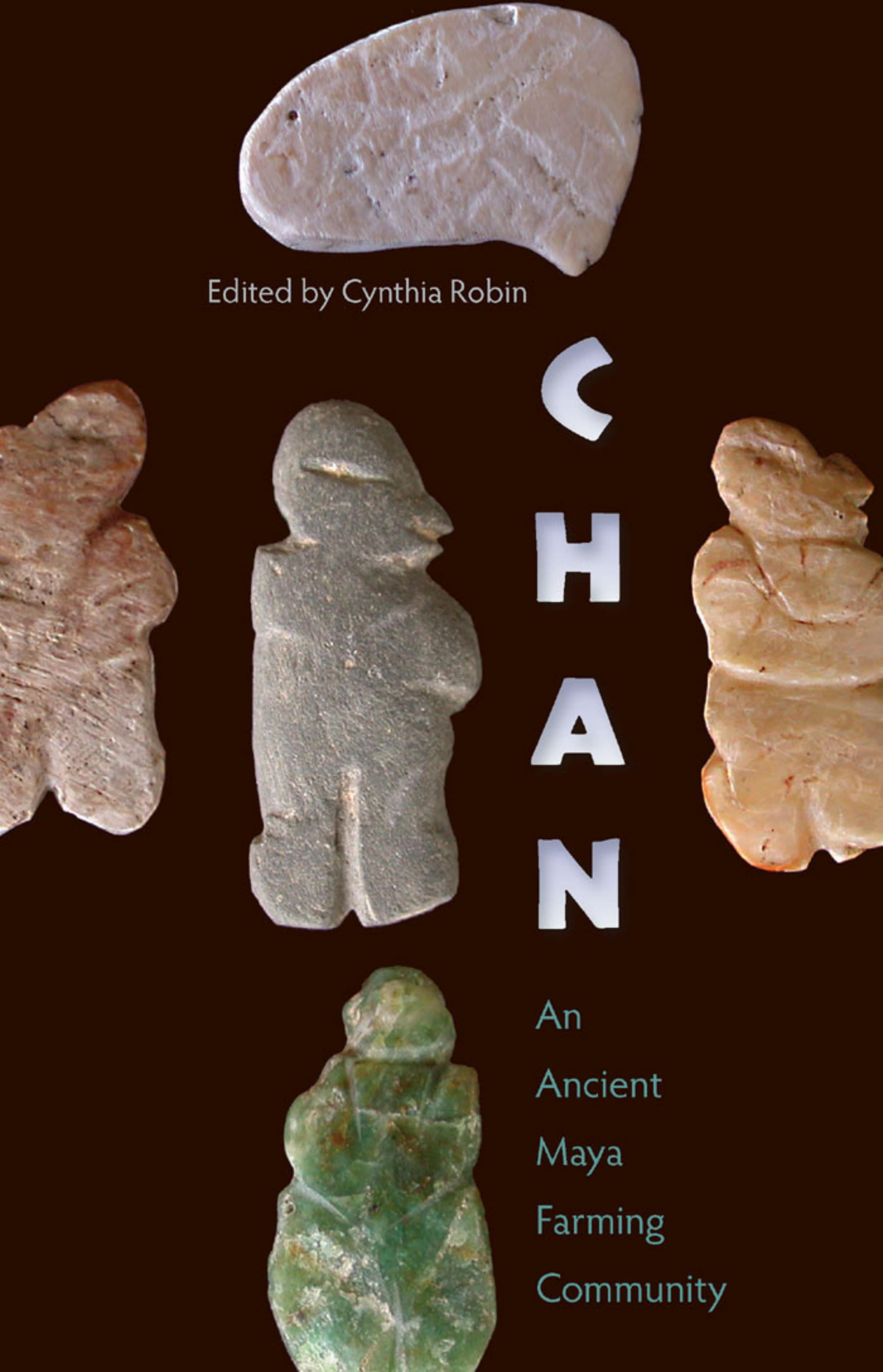

Edited by Cynthia Robin

CHAN

An Ancient Maya Farming Community

Chan

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An Ancient Maya Farming Community

Edited by Cynthia Robin

Foreword by Diane Z. Chase and Arlen F. Chase

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We dedicate this book to all of our Belizean colleagues on the Chan project. Without your help and friendship this book would not have been possible. Thank you!

Merle Alfaro, Nestor Alfaro, Sylvia Batty, Theresa Batty, Bernabe Camal Jr., Bernabe Camal Sr., Edwin Camal, Jonny Camal, Derric Chan, Eduardo Chan, Heriberto Chan, Ifrain Chan, Ismael Chan Sr., Ismael F. Chan Jr., Ismael R. Chan, Eduardo Chi, Elvis Chi, Everaldo Chi, Jaime Chi, Omar Chi, Venura Cocom, Placido Cunil Jr., Roberto Cunil, Ismael Ernandez, Reina Ernandez, Abel Goodoy, Virgilio Goodoy, Ciro Hernandez, Elvis Itza, Roberto Jimenez, Sergio Jimenez, Manuel Kent, Jose Lopez, Mariano Lopez Jr., Gumercindo Mai, Susan Mai, Rosita Marin, Lazaro Martinez, Rosa Martinez, Oscar Mejia, Eder Panti, Jose Luis Panti, Alma Patt, Salvador Penados, Cruz Puc, Elvin Puc, Marta Puc, Nasario Puc, Ricky Puc, Ronnie Puc, Sandra Puc, Sandra Aurora Puc, Ediberto Reyes, Carlos Salgueros, Julia Sanchez, Alex Smith, David Smith, Glenis Smith, Horace Smith, Ken Smith, Joyce Tun, Feliz Uck, Elmer Valdez, Gerald Valdez

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Foreword

While farming is generally recognized as forming the basis for the rise of complex societies, few archaeological researchers have actually focused on the excavation of basic farming households and their relationships to broader social and political structures. Yet that is precisely what the long-term, multidisciplinary research at Chan, Belize, was designed to accomplish. The investigations reported by Cynthia Robin and her colleagues within this volume use the lens of a small farming community to frame the rise and fall of Classic Maya civilization. The site of Chan was occupied from 800 BC to AD 1200 and provides a relatively long vantage point from which to view the role of farmers in a changing Maya society. The smaller community of Chan is only 4 km away from the more architecturally impressive center of Xunantunich. However, rather than assuming that Chan reflected the policies and lifeways of the larger neighboring site, the archaeological project at Chan found a long-term adaptation that was different from the one immediately adjacent in Xunantunich. The detailed study within this volume resulted from almost a decade of fieldwork at Chan that emphasized extensive horizontal excavation; it succeeds in demonstrating the heterogeneity that existed within this community and the ways in which it both supports and contradicts paradigms that are currently accepted in archaeology.

The investigations at Chan focused on the role of farmers and its farming community through the course of Maya prehistory. Archaeological work emphasized households and their relationships to the built and natural environment. Households at Chan participated in both agricultural and nonagricultural production. Material remains and ritual contexts show both intracommunity and pan-Maya connections. Chan was at times community-centered and at other times more outwardly focused. Chan residents were integrated into greater Xunantunich, but the self-sufficiency of farmers and their "leaders" within this community also afforded them a degree of independence. Thus, this volume provides the opportunity to view farmers not only as respondents to events occurring within a broader world but also as self-directed individuals and, potentially, as agents of change for that broader universe.

The detailed studies in this volume will be of great interest to practitioners of Maya studies. This volume functions as a synthetic statement on the archaeological research undertaken at Chan. It provides important information on landscape modifications and the long-term role of farmers within broader Maya society. It also shows how empirical data can influence the theoretical positions that are proffered. The contextualization of mundane items like ceramics and worked stone in conjunction with the ritual deposits of burials and caches demonstrates both the heterogeneity and variability that existed within this community as well as an unexpected level of wealth and power of Chan's farmers. Incorporating these various studies into a single volume permits the reader to see the necessity and value of undertaking and combining interdisciplinary material analyses. Through reporting on and analyzing the results of long-term fieldwork and through providing the details for the underlying archaeological assessments, monographs like this one form the backbone for future interpretations and breakthroughs—both within Maya studies and in general archaeological method and theory. These same carefully reasoned field reports are also key to understanding the dynamics of state formation and the dissolution in complex societies.

Diane Z. Chase and Arlen F. Chase
Series editors

Acknowledgments

The Chan project was a collaborative archaeological endeavor. Over the course of eight years, between 2002 and 2009, the members of the Chan project became a team working together to explore the nature and importance of a Maya farming community. Most project members got a chance to know each other and work together during various field seasons in Belize, where we discussed our questions, goals, and interpretations. Other members worked in various specialized research laboratories largely located in the United States and were drawn into our broader conversations about the meaning of life at Chan at conferences, over the phone, or through e-mail. We came from all over the globe, mostly from Belize and the United States but also from England, Canada, and China. Most of our team were archaeologists—professionals, graduate students, undergraduate students, and volunteers. But we also incorporated multidisciplinary interests from fields such as botany, geology, geography, chemistry, computer science, and art.

We, the twenty authors and coauthors in this volume, represent the lead researchers of the various field and laboratory projects associated with the Chan project, but this project would not have been possible without the hard work and dedication of our 123 project members—the team that makes archaeology such a rewarding collaborative enterprise. We have chosen to dedicate this volume to our Belizean counterparts on the Chan project, our colleagues and friends acknowledged on our dedication page. These individuals are the local field archaeologists, laboratory staff, and project staff, largely from the community of San Jose Succotz, which has been the home of generations of Belizean archaeologists since the days of Eric Thompson. Our Belizean counterparts welcomed us, made us feel at home, taught us how to live and work in Belize, listened to and critiqued our ideas about Chan, and supplied us with some of our most useful insights, as acknowledged across the pages of this volume. Everaldo Chi was the foreman of our fieldwork. Marta Puc supervised our field laboratory, as she did for the Xunantunich Archaeological Project prior to us. Glenis Smith managed our project, a position that is often undertaken by a U.S. professional. Excavation supervisors included Bernabe Camal Sr., Edwin Camal, Ifrain Chan, Ismael R. Chan, Eduardo Chi, Venura Cocom, Placido

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We were fortunate to have wonderful support from the landowners who today own part of what used to be the ancient community of Chan. Ismael Chan Sr. and Derric Chan, the owners of the central portion of the site and for whom the site is named, became our friends and partners in this endeavor as their lifelong interest in protecting and understanding Chan inspired the work that we did. We were also lucky that 47 additional landowners allowed us to survey and excavate on their property, including Rosita Aguallo, Jose Alfaro, Armando Bautista, Thomas Chable, Benigno Chan, Calixto Chan, Francisco Chan, Guadalupe Chan, Ventura Chi, Adele DesRochers, Rogelio Gamez, Virgilio Goodoy, Jose Hiron, Edward Jenkins, Virginia Jenkins, Irene Jimenez, Michael Jones, Valentin Ku, Abelio Leon, Estela Leon, Ireno Magaña, Jose Mai, Amalio Matus, Fidel Matus, Domingo Mesh, Antonio Morales, Francisco Morales, Humberto Morales, Pastora Morales, Leandro Pacheco, Feliciano Panti, Glis Penados, Santiago Gonzalez Pinedos, Antonio Puc, Felipe Puc, Lorenzo Puc, Nasario Puc, Julian Requena, Manuel Reyes, Jovita Guermina Sanches, Ishil Shish, Polo Shish, Felix Uck, Monico Uck, Silvario Uck, Julio Valencia, and Santiago Yacab. Pedro Gonzalez and Maria Jilma Sosa were the landlords of our lab house and residence in San Ignacio, but they were also so much more than landlords to us.

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As discussed in the pages that follow, particularly at the end of chapter 1, the Chan project developed out of the Xunantunich Settlement Survey directed by Wendy Ashmore and the Xunantunich Archaeological Project directed by Richard Leventhal. Our work is very much indebted to their pioneering research in this region of the Belize Valley and to their friendship, advice, and support.

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We come from a wide range of universities and institutions: Northwestern University, Arizona State University, Field Museum of Natural History, University of Arizona, University of Cincinnati, University of California–Riverside, University College London, University of Illinois at Chicago, and University of Wisconsin–Madison. All of these universities have supported us and our work at Chan in innumerable ways beyond grant funding. Andrew Wyatt (2008) was awarded the University of Illinois at Chicago Graduate College Outstanding Thesis award for his dissertation at Chan. Santiago Juarez (2003) and Chris Hetrick (2007) were awarded the Northwestern University Anthropology Department Best Senior Thesis Prize for their research at Chan.

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This volume is based on a 2008 Society for American Archaeology Session on Chan in Vancouver, Canada. That session took place in our penultimate season, and it is only due to the incredible dedication of the Chan team that we were able to submit this volume about our collaborative research to the University Press of Florida in the fall of 2010, just one year after our final field season. University Press of Florida acquisitions editor Kara Schwartz, project editor Catherine-Nevil Parker, copy editor Sally Bennett, and Maya Studies series editors Diane and Arlen Chase were wonderful in all of their assistance in our final preparation of this volume.

In editing this volume, Cynthia Robin would like to add a special thanks to her family. Her parents, Edward and Gloria Robin, have always been an inspiration in her work, and their support in the first year of the project allowed it to become what it became. This volume was largely prepared between the birth of Cynthia's daughter Lyra and her turning nine months old. Lyra is a new incentive and inspiration in Cynthia's work. Her husband René helped her complete the final season of research on Chan while she was pregnant with Lyra and has bailed her out of every tight spot along the way in editing this volume, such as preparing the figures that she lacked the computer savvy to generate and getting her through the long sleepless nights. She couldn't have completed this volume without her family.

All of the figures in this volume except figure 6.2 are original artwork of the Chan project and copyrighted by the Chan project. Andrew Wyatt holds the copyright for the figures in chapter 4. David Lentz holds the copyright for the figures in chapter 5. Chelsea Blackmore holds the copyright for the figures in chapter 9. Figure 6.2 is an illustration by Norman Johnson, reproduced courtesy of the Penn Museum, image #66-5-49. The annual reports of the Chan project and the papers from our 2008 Society for American Archaeology session are available online at our project website: http://www.anthropology.northwestern.edu/chan/.

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1

Introducing the Chan Site

Farmers in Complex Societies

CYNTHIA ROBIN

Understanding the roles of farmers and farming communities in complex societies is a central issue in social science research. This volume is about the Chan site, an ancient Maya farming community in Belize that has a long, 2,000-year occupation history (ca. 800 BC–AD 1200), a farming community that flourished while the fortunes of nearby Maya civic-centers waxed and waned. Given that 2,000 years is a long period of time, what did Chan's residents do to facilitate the longevity of their community?

The scale of the Chan community provides a window into the lives of people who lived in what was a prehistoric Maya agrarian community. Chan's deep chronology provides a means to examine diachronically how farmers' lives were embedded within and significant for the construction of a complex society. The collective research in this volume demonstrates the critical role of farmers and farming communities in the development and organization of Maya civilization.

Four themes unite the inquiries in this volume: (1) understanding the roles of farmers in complex societies, (2) understanding how human societies change, (3) understanding the meaning of community, and (4) understanding practice and everyday life. These themes are outlined here, followed by an overview of the research at Chan and an introduction to the chapters that follow.

Farmers in Complex Societies

Embedded in the history of Western society and culture is a contrast between the city and the country where the city is viewed as the pinnacle of culture and country farming communities are seen as the backwater of ignorance. After growing up in a Welsh border village, when Marxist literary critic Raymond Williams began his academic career at Cambridge he was struck by the images of rural life that filled the pages of academic literature. In *The Country and the City* (1975: 1) he asks us to question romantic Western constructions, which he sums up as follows: "On the country has gathered the idea of a natural way of life: of peace, innocence, and a simple virtue. On the city has gathered the idea of an achieved centre: of learning, communication, light. Powerful hostile associations have also developed: on the city as a place of noise, worldliness and ambition; on the country as a place of backwardness, ignorance, limitation. A contrast between country and city, as fundamental ways of life, reaches back into classical times."

From a traditional viewpoint, country farms and their peasants are defined as backwards and unchanging in contrast to the progress and invention of cities, which drive state-level societies. As erroneous as this dichotomy is for Western society, there are additional issues in its application to non-Western societies such as the ancient Maya, where cities were garden cities, ordinary homes were places of work and learning, and 90 percent of the society lived on a farm.

Karl Marx's (1963 [1869]: 123–24) now overcited commentary on 19th-century French peasants, which does not fully capture Marx's perspective on peasants, epitomizes the traditional peasant model:

> The small holding peasants form a vast mass, the members of which live in similar conditions but without entering into manifold relations with one another. Their mode of production isolates them from one another instead of bringing them into mutual intercourse. . . . Their field of production, the small holding, admits of no division of labor in its cultivation, no application of science and, therefore, no diversity of development, no variety of talent, no wealth of social relationships. Each individual peasant family is almost self-sufficient; it itself directly produces the major part of its consumption and thus acquires its means of life more through exchange with nature than in intercourse with society. . . . In this way, the great mass of the French nation is formed by simple addition of homologous magnitudes, much as potatoes in a sack form a sack of potatoes.

Because peasants produce their subsistence through their own labor as they work off of the land, they are characterized as simple folk, who live within nature and outside of the culture and changes ongoing in society. In the traditional model, peasants are (1) homogeneous, (2) conservative and lacking abilities for specialized production and knowledge, and (3) passive, existing outside of society.

To challenge the traditional peasant model, anthropologist Robert Netting in *Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture* (1993) reexamined contemporary agrarian communities practicing intensive agriculture across Africa, Asia, Europe, and the Americas. These intensive agriculturalists are active and dynamic, existing and changing through their flexible and adaptive innovation of intensification strategies in relation to the different and changing political-economic systems within which they live (1993: 15, 330). Netting refers to these active and heterogeneous intensive agriculturalists as smallholding farmers, to differentiate them from the traditionally defined passive and homogeneous peasants. Smallholding farmers are able to be active participants in their society because (1) they develop socioeconomically heterogeneous relations within and beyond their community, (2) they utilize intensification to produce higher yields on small and/or marginal land plots, and (3) they also produce nonagricultural items for household, community, and/or extracommunity economies (Netting 1993: 12). As Anne Pyburn (1997, 1998) argues, Netting's work is particularly applicable for the ancient Maya who practiced intensive agriculture, as the archaeological data indicate for Chan. Pyburn and others, though, are critical of the seemingly endless flexibility and adaptability of smallholding farmers, which appears to paint them into the opposite extreme of traditionally defined peasants (also see Erickson 2006: 353). We need to assess, not assume, how, when, and to what extent farmers had active and changing roles in their society.

While understanding the roles of rural producers is important in any society (for example, Adams 1966; Kroeber 1948; Redfield 1941; Redman 1978; Trigger 1972; Wolf 1955), it is particularly acute in agrarian-based complex societies, like the ancient Maya, where agricultural producers make up the bulk of society (Fedick 1996a). A historical focus on the excavation of cities, combined with top-down research designs, has led archaeologists in both the New and Old World to seek a renewed focus on the archaeology of rural producers (for example, D'Altroy and Hastorf 2001; Erickson 1993, 2006; A. Joyce et al. 2001; R. Joyce 1991; Lohse and Valdez 2004a; Marcus 1995; Marcus and Stanish 2006; McAnany 2004a; Pyburn 1998; Scarborough et al. 2003; Scarborough and Valdez 2009; Schwartz and Falconer 1994; Sheets 2002; Stein 1999; Wattenmaker 1998). Glenn Schwartz and Steven Falconer (1994: 1) call for making villages and small communities the "focal point" rather than the periphery of archaeological analyses. What have been missing from research are detailed analyses of farming communities and the relations between farming communities and cities, which the authors in this volume are attempting to construct for Chan. Only with this analysis in hand can we adequately model the dynamics of organization in complex societies. From the archaeological studies of ancient farming communities around the world that have developed through this line of questioning it is now clear that ancient farming communities are socioeconomically heterogeneous, with innovative abilities for specialized production in agricultural and nonagricultural products, and active and integrated within their societies (for example, D'Altroy and Hastorf 2001; Erickson 1993, 2006; Falconer 1995; Lohse and Valdez 2004a; Gonlin and Lohse 2007; Marcus and Stanish 2006; Pyburn 1998; McAnany 2004a; Scarborough et al. 2003; Scarborough and Valdez 2009; Sheets 2002; Schwartz and Falconer 1994; Smith 1994).

Given this history, it is unsurprising that many models of complexity see the development of ancient complexity as emanating from cities. But are cities exclusively or always pinnacles of cultural advancement? Erickson (2006) illustrates how persistent assumptions about the abilities of farmers are in recent archaeological research and calls upon archaeologists to conduct research that views farmers as more than faceless masses. As Brumfiel (1992: 553) states, when archaeologists fail to investigate the activities of marginalized groups, such as peasants, and instead make assumptions about their roles, the result is "the widespread acceptance of untested, and possibly erroneous, interpretations." Brumfiel calls on archaeologists to erase such distorted prehistories "with models that expose our implicit assumptions concerning human roles and capabilities to critical reflection and hypothesis testing" (Brumfiel 1992: 553).

How Societies Change: Lessons from Rural Community Studies

There is perhaps no issue that is better addressed by the discipline of archaeology with its unique access to the deep history of humanity than the question of how societies change. The question of change is also at the heart of anthropological studies of "peasant" communities that seek to explore how peasant lifestyles change in capitalist economies.

Eric Wolf (1955) defines two types of peasant communities: an "open" community, which in the face of external mechanisms, particularly the exploitative demands of states, emphasizes interaction with state authorities and ties its fortunes to outside demands developing oppressive structures of stratification similar to those of the state and dissimilar to preexisting community orders; and the contrasting "closed" community, which turns inward, becoming more self-sufficient as a means to buffer itself from the exploitative demands of the state by creating greater autonomy from the state.

As heuristic types, Wolf's "open" and "closed" communities model change in peasant communities as something that happens in reaction to the outside world. Missing are the community-wide internal mechanisms that can also lead to change (Redfield 1950). Community-internal socio-economic relations can lead to developing an "open" community in which members seek to expand political-economic relations outside of their communities. In a similar vein, long-term community survival, rather than short-term economic gain, can be an internal force leading any community (peasant community or city) to become inward looking and maximize its own productive potential (Adams 1978; Falconer 1995).

What we learn from the above-mentioned studies is that both external and internal forces can lead to change in communities, and it is the researcher's prerogative to explore both of these mechanisms. Also, rather than seeing Wolf's "open" and "closed" communities as two types of communities, we can define "open" and "closed" as two types of strategies that members of communities (peasant communities and other communities) can draw upon to take advantage of or buffer themselves against the vagaries of interactions within complex societies. Open and closed strategies are not mutually exclusive and can be combined and may be variably used by any community through time.

While there is a deep intellectual history to understanding how cities and states effect change in rural communities, the corollary question of how rural communities effect change in their societies is less explored. Most often peasants are seen as active agents of social change when they rebel (for example, Gossen 1994, 1996; Newling 2001; Scott 1985; Wolf 1969; Womack 1999). But James Scott (1985, 1990) questions those academic traditions because they play into the stereotype of the passive peasants who only become active when forced to do so by extraordinary external pressures. Scott's work (1985, 1990) with Malaysian peasants demonstrates that change can happen every day in subtle acts as people accept and question existing ideas and norms. Extraordinary political events such as rebellion and regime change are few and far between in the course of human history and cannot provide an adequate explanation for the host of long-term changes we see in human societies. Instead we can also explore the ordinary things that people do on an everyday basis, the things that may escape the notice of a historian, politician, or social scientist but which in the end may be a significant and effective means of change.

Western colonialism and capitalism have penetrated all reaches of the modern world (Wolf 1982). While explorations of contemporary societies can reveal a range of social scenarios, there may be ancient social scenarios that do not have parallels in the modern world. Only the discipline of archaeology with its deep access to human history can assess change in societies and cultures unaffected by Western colonialism and capitalist penetration. From the archaeology of precapitalist rural communities we can see not only how states impact rural communities (for example, D'Altroy and Hastorf 2001; A. Joyce et al. 2001; Stein 1999; Wattenmaker 1998) but also, in the temporal depth of the archaeological record, how developments and changes within rural communities are integral for developments in state formation (for example, Brumfiel 1992; Falconer 1995; Kuijt 2000; McAnany 2004a; Pyburn 1998; Sheets 2002). With its deep 2,000-year history, Chan provides an ideal case study to explore how a farming community changes and the extent to which it impacted or was impacted by broader changes in a complex society.

The Importance of Community

As much as this volume is about the nature of a farming community, it is also about the nature of community itself. Being part of a community is an important way people define themselves in most societies. Longitudinal community-based ethnographies were a critical part of peasant studies in anthropology because community simultaneously was an important entity in peasants' consciousness and had a distinctiveness that was apparent to outsiders (Redfield 1960). But the "little community" of peasant studies (which could contain around 4,000 people) was a homogeneous community of self-sufficient agricultural producers (Redfield 1960), not the heterogeneous community we now know peasant communities to be.

A community is both a place and a group of people who create a salient social identity based upon that place (Yaeger and Canuto 2000). Drawing on Marcello Canuto and Jason Yaeger's *Archaeology of Communities: A New World Perspective,* our focus in this volume is on the people who made Chan a community and the actions and interactions through which they created community. But this focus on the social community does not imply that the space of the community is any less meaningful. As Yaeger and Canuto note (2006:6), in communities "there must exist physical venues for the repeated, meaningful interactions needed to create and maintain a community," as we have identified at Chan.

We knew at the onset of our archaeological research that Chan was a site (a discrete settlement cluster). But we wanted to know if that site was an emically defined community for its ancient residents. And if it was, was it a community across its 2,000-year history, or was it at some earlier point in time a dispersed cluster of farmsteads?

Another important social unit for our analyses is the household, the members of which reside in the houses and house-lots identified across Chan. Because we establish that Chan is a heterogeneous community, detailed household studies at a range of households across the community are required to understand the diversity that existed in the community. This is the opposite approach to that of "little community" studies, in which assumed homogeneity allowed observers to get to know a whole community through any one part of it.

Households, like communities, are central to peoples' lives. For the ancient Maya, houses and house-lots were places where people lived, worked, raised families, created memories, and interacted with others (Wilk and Ashmore 1988; Hendon 2004, 2010; Hutson 2010; Robin 2002a, 2003; Sheets 2002). Studying households is a critical way in which archaeologists can get at the people of the archaeological record. By placing Chan's households within the larger context of the community and then placing that community in the well-understood regional networks of the Belize Valley and Maya world, we can make a more complete assessment of the organization of society that considers both local and regional dynamics.

Practice and Everyday Life

Ultimately this volume is about understanding ancient farmers' lives. What our researchers are attempting to do is to produce a "thick description" (*sensu stricto* Geertz 1973) of life across the 2,000-year history of a Maya farming community.

Getting at the people behind the artifacts has long been a goal of archaeological research. Practice theory has emerged in archaeology and other disciplines as a central paradigm for understanding people and their practices (for example, Bourdieu 1977; Giddens 1984; Ortner 1984). Practice theory holds that it is through what people do (practices) that we produce and reproduce the structure of our society. Practice theory is particularly applicable to archaeological research because it considers materials and spaces as critical to the constitution of society, because these are the objective creations that people subjectively experience and interpret to learn about their world. In a related vein, theories of everyday life, a less well known body of theory, hold that the things people do on a day-to-day basis are not simply mundane acts but are the critical building blocks of human societies (de Certeau 1984; Gardiner 2000; Lefebvre 1992 [1958]).

While the insights of practice and everyday life theories at one level might seem obvious, in terms of the history of anthropological theory, its major intellectual traditions, such as structuralism, functionalism, symbolic approaches, and so on, assigned peoples' everyday practices a passive position, because daily practices were presumed to be guided by objective structures or presumed to be determined by individual subjectivities, particularly the will of important people in society. This lack of attention to ordinary practices is amplified in archaeology, with its traditional focus on excavating the grand monuments of the ancient world. By understanding the people of Chan and what they did, the authors in this volume attempt to illustrate the importance of everyday life in a farming community for understanding the operation of a complex society.

About Chan

Chan is located in the upper Belize Valley region of west-central Belize, in an upland area between the Mopan and Macal branches of the Belize River (figure 1.1). Across its undulating upland terrain, its ancient inhabitants constructed a productive landscape of agricultural terraces surrounding a community center. This agricultural base supported Chan's 2,000-year occupation (800 BC–AD 1200), which spans the major periods of political-economic change in Maya society (the Preclassic, Classic, and Postclassic periods).

An eight-year program of archaeological investigation began at Chan in 2002 and concluded in 2009 (Robin 2009; Robin et al. 2004, 2005). The project was permitted by the Belize Institute of Archaeology. It was generously funded by the National Science Foundation, National Endowment for the Humanities, National Geographic Society, Heinz Foundation for Latin American Research, Foundation for the Advancement of Mesoamerican Studies, Northwestern University, and many of the other institutions represented by our researchers. During the 2002 and 2003 seasons the

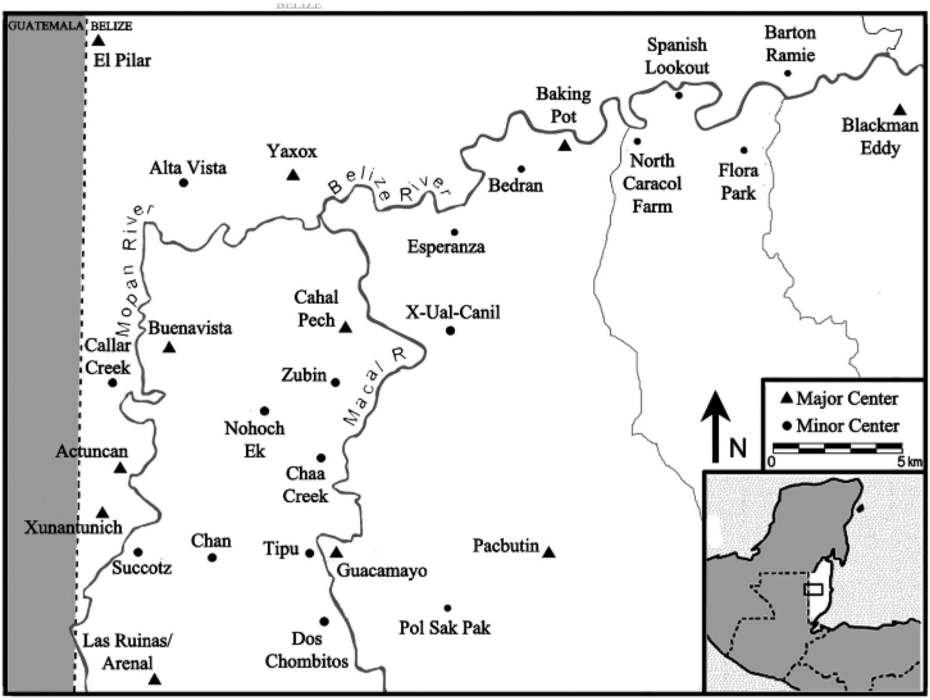

Figure 1.1. Map of the Belize River valley and Maya area showing the location of Chan. (Illustration by Elizabeth Schiffman.)

project mapped a 3.2 sq km area and documented 274 households, 1,223 agricultural terraces, and Chan's community center (figure 1.2). Between 2003 and 2006 and in 2009, excavations were completed at a 10 percent sample of Chan's households (26 households), to represent the temporal, socioeconomic, and vocational variability in households at the site. All ritual, residential, and administrative buildings at Chan's community center were also excavated. Laboratory analyses of excavated materials from Chan continued through 2009.

The majority of Chan's residents were farmers. In addition to farmers' households, one biface production household and eleven limestone quarrying areas were identified during the Chan survey, and excavations showed that Chan's leading families were involved in low-intensity *Strombus* shell ornament production and obsidian blade production (see chapters 10, 11, 13, and 14). These suggest the types of nonagricultural production that were also ongoing in this farming community.

Farmers' agricultural terraces are the most ubiquitous and substantial constructions at Chan. Farmers constructed terraces up and down

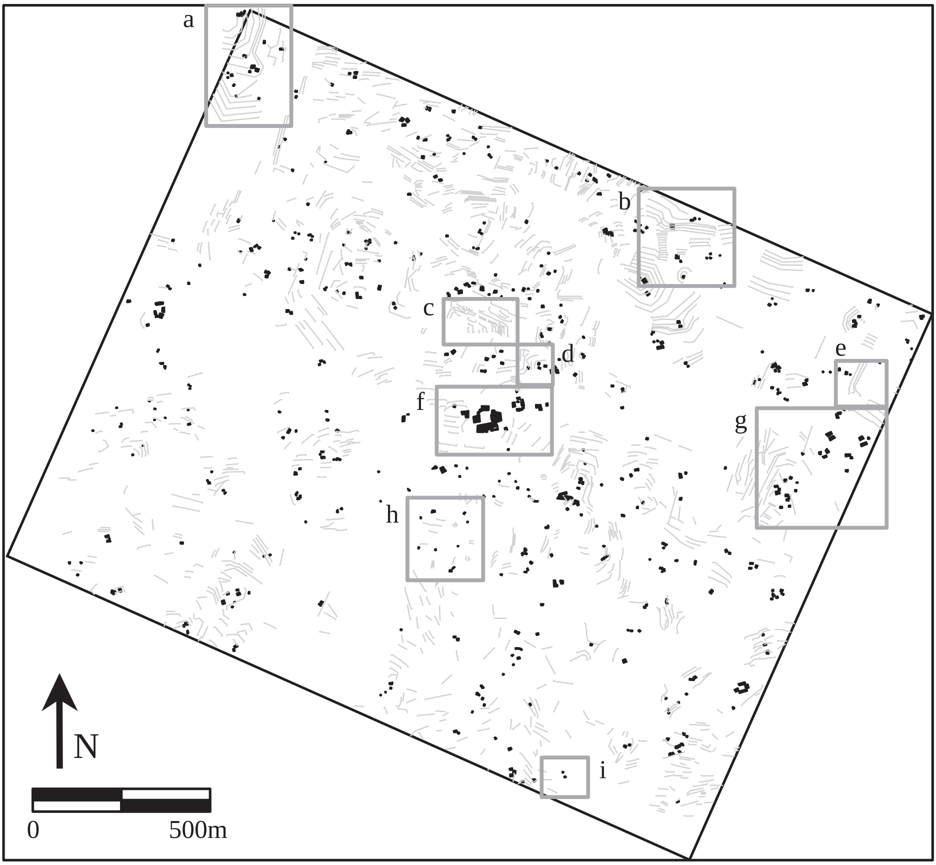

Figure 1.2. Settlement at Chan showing excavation areas: (a) Operation 15 agricultural terrace and household excavations (chapter 4); (b) Operation 4 agricultural terrace and household excavations (chapter 4); (c) Operation 20 agricultural terrace excavations (chapter 4); (d) Operation 28 limestone quarry and household excavations (chapter 11); (e) Operation 18 agricultural terrace excavations (chapter 4); (f) Central Group, West Plaza, and leading family household excavations (chapters 6, 7, 8); (g) Northeast Group midlevel neighborhood excavations (chapter 9); (h) small farming family household excavations (Chan Nòohol; this chapter); and (i) chert biface production household excavations (chapter 10).

hillslopes and across channels. Farmers' homes are surrounded by their agricultural terraces, making the farmstead (a residential and agricultural area) the basic settlement unit at Chan. All of Chan's residents, from its humblest farmer to its community leaders, lived in perishable buildings with thatch roofs constructed on stone substructures.

Chan's community center is located at the spatial and geographical center of the community on a local high point in the topography. It consists of two adjoining plazas: the plaza of the Central Group and the West Plaza. The Central Group is the largest architectural complex and plaza at Chan and its main location for community-level ceremony, administration, and adjudication. It also houses a residence and associated ancillary structures for Chan's leading family. On the east and west sides of the Central Group are an E-Group, a distinctive type of architectural complex common throughout the Maya area that was an important location for ritual and ancestor veneration. The east structure of the E-Group is the tallest structure at Chan, rising to a height of 5.6 m.

One measure that Mayanists use to judge site size is the height of the largest pyramidal structure at a site. At Tikal, the largest Classic Maya regal center, located in the Petén area of Guatemala, the tallest temple (Temple IV) is 60 m high. At Xunantunich, the capital of the Late Classic polity that included Chan, which is considered a midsized Maya center, the tallest temple (El Castillo) is 43 m in height. Chan, with its east temple only 5.6 m high, is not the smallest Maya site in terms of pyramidal structure height. At Bedran, located 1 km southwest of Baking Pot, in the central Belize Valley, there is an E-Group with an east structure 2 m high (Conlon and Powis 2004). But Chan certainly represents the smaller end of the spectrum of sites in the Maya area.

The Belize Valley region where Chan is located was a peripheral and provincial part of the Maya world throughout most of its history. During the Preclassic, Early Classic, and early Late Classic periods (800 BC–AD 670), numerous midsized centers jockeyed for power across the region. These centers were organized as competitive peers, but none became a paramount center in the region (Ashmore 2010; Ball 1993; Ball and Taschek 1991; Houston et al. 1992; Leventhal and Ashmore 2004; Reents-Budet 1994; Taschek and Ball 1992). Many of these centers have been the subject of extensive archaeological research or are currently under investigation so their political histories can be understood. Among these midsized centers are Actuncan (LeCount 2004a), Baking Pot (Audet and Awe 2004), Blackman Eddy (Garber et al. 2004), Buenavista (Ball and Taschek 2001; Yaeger et al. 2009), Cahal Pech (Awe 1992), Guacamayo (Ashmore 2010; Neff et al. 1995), Las Ruinas (Ball and Taschek 1991), and Xunantunich (Leventhal and Ashmore 2004).

As documented by the Xunantunich Archaeological Project, at the end of the Late Classic (AD 670–800/830) this well-developed landscape was unified under the short-lived and late-flourishing Xunantunich polity capital (LeCount and Yaeger 2010; Leventhal and Ashmore 2004). Located 4 km to the southeast of Xunantunich, Chan and Xunantunich are within a few hours' walk from each other, and Chan was part of the late Late Classic Xunantunich polity.

This regional history provides us with a very interesting case study to explore farming community-center relationships. Through time, Chan interacted with numerous Belize River valley centers in complex and overlapping relations of influence and authority. The late intrusion of the polity capital of Xunantunich into the long history of Chan provides an opportunity to explore how a farming community might be transformed by its interaction with a polity capital and, as well, how a rising polity capital might have needed to accommodate to preexisting contexts in farming communities. In light of Chan's history and the broader regional history of the Belize Valley, the Chan project was developed to accomplish two goals: (1) to understand the lives of Chan's residents across its 2,000-year history, and (2) to examine how changes in farming community life affected and were affected by broader political-economic changes in Maya society. Furthermore, what was the relationship between life in a farming community and life in a Maya center during the pre-Columbian period?

Previous Research

The Chan research developed out of the Xunantunich settlement survey research (1994–95) directed by Wendy Ashmore (Ashmore et al. 1994, 2004). In 1994 archaeologists on the Xunantunich settlement survey first mapped the central portions of the Chan site while surveying a transect 8 km long, extending from the polity capital of Xunantunich to the nearby center of Dos Chombitos.

I conducted the initial research at Chan between 1995 and 1997 as part of my PhD dissertation (Robin 1999, 2001, 2002a, 2002b, 2003, 2004a, 2006). This work focused on an investigation of seven of Chan's smallest single-phase late Late Classic (AD 670–780) households (type 1 and 2 households, defined in chapter 3; figure 1.3). These households represent

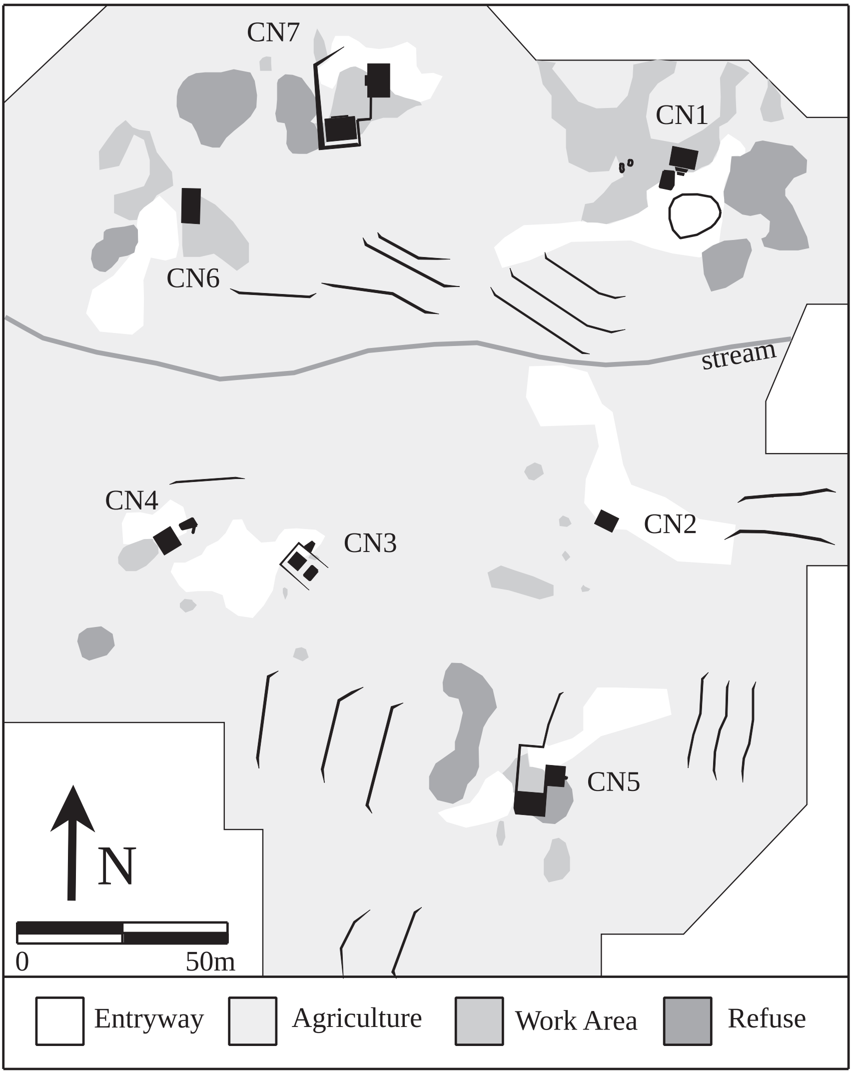

Figure 1.3. Chan Nòohol, a cluster of small farmsteads south of Chan's community center.

Chan's most recent residents, who inhabited the site during its population apogee (also the period of Xunantunich's florescence). This household cluster is located south of the Chan community center (see figure 1.2) and thus was called Chan Nòohol (*nòohol* is Yucatec Maya for south). At Chan Nòohol, farmers' houses are located within a network of intensively managed agricultural terraces, identifying the farmstead as the basic residential unit for farmers. Farm families comprising men, women, and children worked in house-lots and agricultural fields that were neither spatially nor socially separated. These "domestic" spaces were also places of ritual life and small-scale neighborhood-wide feasts. Despite the small-scale nature of these households, they were heterogenous—residents had access to a range of local and long-distance trade items, the latter of which indicate the interpenetration of farmers' lives and broader Maya economies. While this research answered some questions about the heterogeneous nature of even the humblest of Maya farming families, it also generated new research questions. How were Chan's newest households part of a community? How did Chan as a community with a deep history relate to other communities in the Belize Valley and Maya world? These questions generated the current Chan project.

The Current Volume

This volume contains fourteen archaeological case studies from Chan written by twenty of the Chan researchers. The volume is organized into four parts addressing central aspects of the organization and development of the Chan community and their implications for understanding broader changes in Maya society.

Part 1. "Time, Space, and Landscapes" lays the foundation for understanding Chan as a community. The chapters in this section explore the temporal occupation of the community, the nature of its changing settlement patterns, its environmental setting and agroforestry practices, and the organization and broader political-economic implications of its agricultural production.

Part 2. "Life in a Farming Community Center" explores the public, administrative, ritual, and residential functions of a farming community center and the ways in which developments in these areas of farming community life influenced Maya society. The chapters in this section explore the construction of community ritual, the lives of the leading families, the nature of community leadership and administration, and the use of public spaces.

Part 3. "Diversity across the Chan Community" explores the social and economic variability in households across Chan. The dynamic and changing roles of Chan's residents within and beyond the community are illustrated by the chapters in this section. These chapters focus on Chan's diverse range of households, from humble households to midlevel households, farming households, and specialized craft producer households, specifically, those of biface producers and limestone quarriers.

Part 4. "Bodies, Material Culture, and Meaning" illustrates how Chan's residents materialized meanings of community and individual lives through the use and burial of objects and human bodies. The chapters in this section explore human remains buried at Chan, the use and significance of shell objects, the provenance of obsidian blades, and the deposition of ceramics and other objects in ritual deposits.

As significant as our research questions, this volume is an example of a collaborative multidisciplinary research design on the part of an archaeological team that includes professional, graduate student, and undergraduate researchers, all of whom have a range of skills relevant to the research in question. This volume also articulates the methodological issues involved in this type of collaborative research focused on an ancient community. The Chan project utilized modern excavation procedures and artifact analyses to accomplish its goals, but it also expanded the archaeologist's toolkit in a novel way by incorporating an array of new scientific analyses to allow greater access into the minutiae of the daily lives of ancient people. These methods include chemical studies of soils and floors to identify the "invisible" chemical signatures of ancient activity areas, microartifact studies that examine the types of artifacts that the brooms of ancient sweepers missed, paleoethnobotanical studies, and compositional studies that identify the provenance artifacts.

The authors in this volume attempt to study Chan, a site of regular archaeological preservation, with the same detailed lens that Payson Sheets and colleagues (2002) applied to the Cerén site, a Maya farming community with exceptional preservation. In the Cerén work, Mayanists have an unusually rich glimpse into daily life in a farming community at a particular historical moment during the Early Classic period when a volcanic eruption occurred. The Chan volume attempts to show that in-depth knowledge can be gleaned if intensive collaborative research, similar to that undertaken at Cerén, is applied to a farming community of regular archaeological preservation.

The Chan project is a direct offshoot of Wendy Ashmore's Xunantunich settlement survey, which first mapped the central portions of Chan. But our research is even more about Wendy Ashmore's intellectual legacy in the field of archaeology. From her early role in the development of settlement and household research to her more recent explorations of archaeological landscapes, Ashmore's research instructs scholars how to use detailed archaeological studies to come closer to the lives of the people whom we study (Ashmore 1981, 1991; Wilk and Ashmore 1988; Ashmore and Knapp 1999). In her distinguished lecture to the American Anthropological Association (2002), she brought these strands of research together to call archaeologists to socialize the spaces and places of the archaeological record. Together the authors in this volume paint a vivid and dynamic picture of everyday life in a Maya farming community, and in so doing they illustrate how interpreting the complexities of life in a farming community is essential for understanding larger issues of organization and change within complex societies.

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Time, Space, and Landscapes

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2

A Changing Cultural Landscape

Settlement Survey and GIS at Chan

CYNTHIA ROBIN, ANDREW R. WYATT, LAURA J. KOSAKOWSKY, SANTIAGO JUAREZ, ETHAN KALOSKY, AND ELISE ENTERKIN

The first step toward understanding Chan's 2,000-year history was to conduct a full-coverage archaeological survey (3.2 km) to document the cultural and natural terrain of the community. Archaeological settlement surveys examine the remains of ancient settlements across the landscape. They bring together an understanding of the communities people built and the environments they inherited, lived with, and modified. In the defining publication of Maya settlement survey, *Lowland Maya Settlement Patterns* (Ashmore 1981), Wendy Ashmore and Gordon Willey (1981: 4) lay out what remain these two interrelated goals of settlement archaeology: "(1) those concerning people in their relationships to their natural ambience (ecological); and (2) those concerning people in their relationships to other people (social and political)."

It is perhaps fitting that Chan is situated in the Belize Valley, a region that has been at the heart of developments in Maya settlement survey and archaeological settlement survey more broadly. Gordon Willey's pioneering research at Barton Ramie in the 1950s was the first formal settlement survey work in the Maya area (Willey et al. 1965). It demonstrated to Mayanists and other archaeologists that questions about the organization of complex societies could not be answered without understanding complete ancient settlements. Also, because Barton Ramie is a settlement area that lacks a major civic center, this work illustrated the importance of understanding all segments of society.

The Chan settlement survey was conducted across the project's initial two field seasons in 2002 and 2003. The 2002 field season was dedicated to survey work, and the survey was completed in 2003. The Chan settlement survey included a 3.2 km settlement area and identified 275 mound groups (including 274 households and a small site center) and 1,223 agricultural terraces in an interfluvial area of undulating limestone uplands (high, rounded hills with peaks greater than 160 m) between the Mopan and Macal branches of the Belize River. The settlement survey utilized topographic mapping, archaeological reconnaissance, surface collections, and Geographical Information Systems (GIS) modeling to develop an understanding of Chan's changing cultural landscape.

The 2002 Chan settlement survey was directed by Cynthia Robin with project surveyors William Middleton, Santiago Juarez, Mary Morrison, and Brian Dema (Juarez 2003; Robin 2002c; Robin et al. 2004). The 2003 Chan settlement survey was directed by Andrew Wyatt with project surveyor Ethan Kalosky (Kalosky 2004; Wyatt 2008a; Wyatt and Kalosky 2003). Elise Docster (2008) developed the GIS model of the site. Laura Kosakowsky (2007) analyzed the ceramics from settlement survey surface collections.

Surveying the Chan Site

The Chan site was first identified by archaeologists in 1994 on the Xunantunich settlement survey directed by Wendy Ashmore (Ashmore et al. 1994, 2004). Chan had been long known to the nearby residents of the contemporary community of San Jose Succotz, Belize, and it is named after its landowners—dons Ismael and Derric Chan.

The Xunantunich settlement survey work extended a survey transect, transect archaeological 1, measuring 400 m wide and 8 km long southeast from the polity capital of Xunantunich along the Mopan branch of the Belize River to the minor center of Dos Chombitos along the Macal branch of the Belize River. The survey of transect archaeological 1 began in 1994 and was completed in 1995. A settlement concentration is intuitively visible in the center of this transect equidistant (4 km) between Xunantunich and Dos Chombitos (figure 2.1). Surveyors also identified and mapped a small site center defined by three plaza groups just north of the transect and north of the settlement concentration. This settlement concentration and small site center, now known as Chan, is not only intuitively visible but also identifiable based upon nearest neighbor and stem-and-leaf analysis (VandenBosch in Ashmore et al. 1994).

The Xunantunich settlement survey's transect archaeological 1 had identified the east and west boundaries of the Chan site, which are located approximately 1 km to the east and west of the site center. Rather than continue survey transect work to precisely identify the north and south

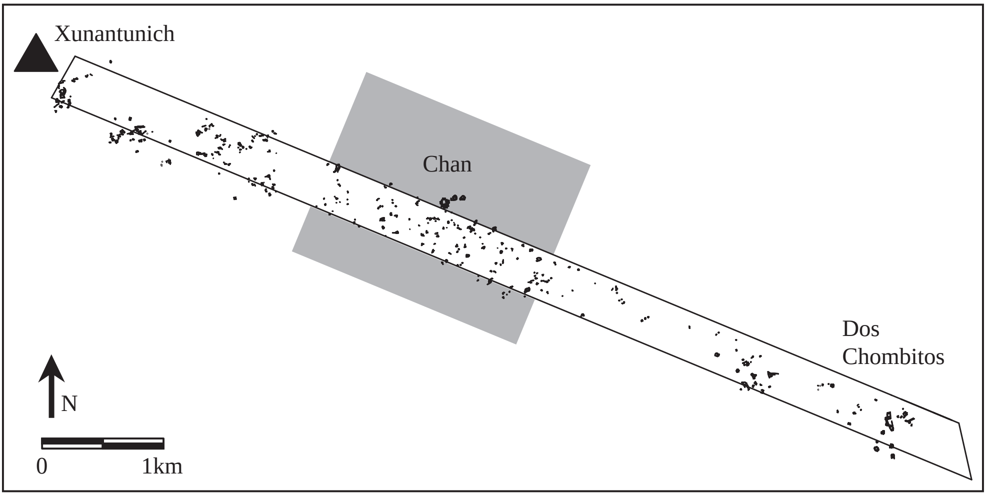

Figure 2.1. Transect archaeological 1 of the Xunantunich settlement survey showing the settlement cluster identified as Chan.

boundaries of the site, the Chan settlement survey focused on undertaking a full-coverage survey of the settlement within the Chan site itself. We defined a 3.2 km survey area surrounding the site core and focused on complete survey coverage of this area (figure 2.1).[1]

Mounds, mound groups, terraces, and terrace sets make up the majority of the cultural features surveyors identified on the Chan survey. Mounds are the remains of stone structures that were often ancient houses. Mound groups consist of mounds and other cultural features such as platforms, retaining walls, *sacbe*s (roads), ramps, *aguadas* (waterholes/reservoirs), quarries, modified bedrock features, and *chultuns* (subterranean chambers). A mound group is defined as one or more archaeological features (excluding terraces) in which individual features are less than 25 m distant from one another and all other features are more than 25 m distant. The 25 m cutoff point was derived in part from pilot observations of the Xunantunich settlement survey, which found that feature clusters defined in this way consistently yielded entities identifiable as anciently meaningful settlement units (Ashmore et al. 1994; Neff et al. 1995). Based on a range of ethnographic and archaeological evidence, house-lots around ancient and contemporary Maya house compounds often extend for roughly 20 m beyond the house compound area (for example, Hanks 1990; Killion 1992a; Robin 1999, 2002a). Excavations at Chan have now shown that most mound groups best correspond to the ancient social unit of the household.

Single mounds represent single family households and mound groups represent multiple or extended family households. For this presentation of survey data we retain the term *mound group* to describe Chan's settlement, but subsequent chapters in this volume refer to these units as households, as identified in excavations.

Terraces are one- to three-sided shelflike slope modification features. Groups of terraces are called terrace sets. They were recorded separately from mound groups because formally these features differed recognizably from other archaeological features and functionally they had distinctive uses from mound groups. While mounds approximate ancient household units, terrace sets approximate ancient agricultural units (Wyatt 2008a).

Mound groups identified at Chan were given a sequential number beginning with C-001. C-001 designates Chan's Central Group. Terrace sets at Chan were given a sequential number beginning with TC-001.

Settlement and Agriculture at Chan

Across Chan's hilly terrain, a total of 562 mounds were identified at Chan's 275 mound groups, and its 396 terrace sets included 1,223 terraces (figure 2.2 shows mounds and topography; see figure 1.2 for terraces). Mound groups are relatively dispersed across the site, as they are surrounded by agricultural terraces. Thus, the farmstead (a residential and agricultural area; Dunning 2004) was the basic settlement unit at Chan.

Terraces and Chan's Agricultural Potential

Terraces are the most ubiquitous and substantial constructions at Chan. Chan's residents constructed terraces along hillslopes and across channels. Although sites across the Belize Valley are heavily terraced, with a density of 382 terraces per square kilometer, there is a greater density of terraces recorded at the Chan site than reported from settlement surveys conducted in the surrounding Xunantunich region, where densities of between 164 and 227 terraces per square kilometer were identified based on comparable survey methods (Ashmore et al. 1994; Neff et al. 1995; Yeager and Connell 1993). High soil quality in the Belize Valley coupled with Chan's undulating limestone uplands (high, rounded hills with peaks greater than 160 m) make it particularly well suited and adapted for terrace agriculture (Juarez 2003; Wyatt 2008a and ch. 4, this vol.).

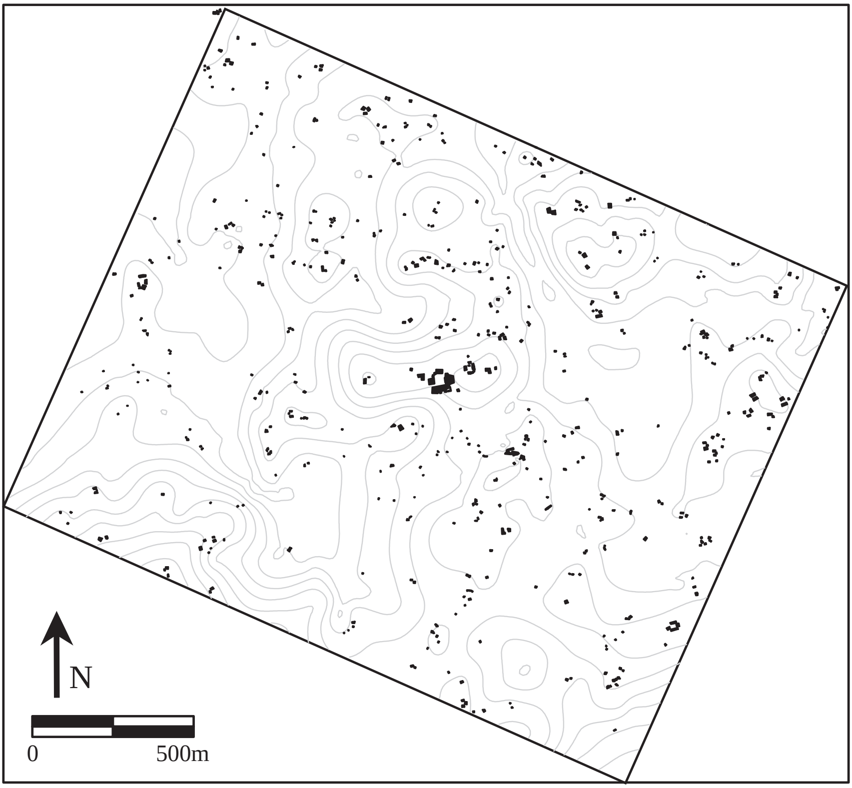

Figure 2.2. Topography and settlement at Chan. Ten meter contour interval.

Farmers' selection of particular types of slopes for terrace construction illustrates qualities of Chan's terrain that made it suitable for terrace agriculture. Farmers constructed 75 percent of terrace sets (*n*=297) on gentle (10°–18°) or moderate (19°–27°) slopes. Steep slopes (28°–37°) were too steep for terrace construction and flat areas, and very gentle slopes (less than 10°) did not require terracing (Wyatt 2008a: 113).

Terraces at Chan ranged in height from 0.1 m to 3.15 m and in length from 2.5 m to 300 m. On average, terraces in terrace sets had a maximum height of 1.16 m and a minimum height of 0.65 m and a maximum length of 85 m and a minimum length of 53 m, making them not only more ubiquitous than mounds at Chan but also more substantial in their construction (Wyatt 2008a: 102–18). In terms of their construction efforts, farmers at Chan expended more energy building terraces for agriculture than they did in house construction. While this part of the Belize Valley has long been considered an important area for agricultural production in Maya society (Ashmore et al. 2004; Ford and Fedick 1992; Willey et al. 1965), Chan's residents made particular use of their local environment in terrace construction to develop agricultural production at Chan.

Nonagricultural Activities

Agriculture was the primary livelihood of Chan's residents. The settlement survey also identified one biface production household (C-199) located 1 km to the southeast of the center of the site (Hearth, ch. 10, this vol.) and eleven areas of limestone quarrying and associated households located around the central area of the site (Kestle, ch. 11, this vol.). Biface production and limestone quarrying indicate that nonagricultural production was also ongoing at Chan. Subsequent excavations have found evidence of additional productive activities at Chan such as shell working (Keller, ch. 13, this vol.) and obsidian blade production (Meierhoff et al., ch. 14, this vol.). The productive activities of an agrarian community were not restricted to agricultural production but also included a range of nonagricultural productive activities.

Constructing Mounds in Appropriate Places

The majority of Chan's mounds are quite low and would have supported perishable superstructures. Only one mound at Chan, its central administrative building (located in the Central Group, C-001), is a masonry building with a vaulted stone roof (Robin et al., ch. 7, this vol.). Residential mounds at Chan have an average elevation of 0.55 m. Average residential mound height ranges from 0.05 m to 2.15 m. Of the residential mounds, 59 percent have an average elevation of less than 0.50 m and 91 percent have an average elevation of less than 1 m.

Just as farmers identified particular types of terrain as appropriate for the construction of terraces, other types of terrain were seen as appropriate for the construction of mounds. While farmers selected gentle and moderate slopes for the construction of terraces, they selected relatively flat terrain for the construction of mounds. There are more mounds than expected in flat or very gently sloping terrain (less than 10°) and fewer mounds than expected on gentle, moderate, and steep terrain (10°–37°), assuming the null hypothesis that mounds would be equally distributed across hillslopes (Docster 2008). Relatively flat terrain may have been more suitable for the construction of houses and the yards, lots, and work spaces around them. Also, by placing mounds in relatively flat terrain farmers were building domestic spaces away from the sloping terrain they defined as ideal agricultural spaces.

Additionally, there are more mounds than expected at higher elevations and fewer mounds than expected at lower elevations (Docster 2008). Environmental issues such as seasonal wetness in areas of low elevation or ample breezes in areas of higher elevation may have been factors affecting farmers' decisions. As well, cultural values associated with elevation may have come into play—such as beliefs about greater symbolic importance being attached to higher elevations. As they constructed homes and fields, farmers drew upon local and cultural knowledge about the meaning and significance of the landscape that made up the Chan community.

Mound Groups and Socioeconomic Variability

To begin to assess the socioeconomic variability in Chan's settlement, investigators classified mound groups into a seven-tiered mound-group typology (table 2.1). This typology was initially developed by Jennifer Ehret on the Xunantunich settlement survey (Ashmore et al. 1994). It utilizes four criteria—number of mounds and platforms, height of mounds and platforms, formality of mound arrangement, and presence or absence of a focal mound—to classify mound groups. The smallest and least formal type 1 mound group consists of isolated mounds and associated features that are 1 m or less in height. The largest and most formal type 7 mound groups consist of a platform group with four or more mounds, at least one of which is 5 m in height. Type 2 to 6 mound groups represent variation in terms of size and formality between these two extremes.

There is only 1 type 7 mound group, Chan's Central Group (C-001), at the site. The Central Group is located at the spatial and geographical center of the site on a local high point in the topography. From the Central Group the majority of Chan's settlement was visible, and Chan's residents would have likewise been able to see the Central Group. Both the main temples at Xunantunich and Dos Chombitos are visible from the Central Group. Just as the rulers of Xunantunich constructed their civic center in a location with a commanding view of the polity, a view from which to see and be seen (Ashmore 2010), the leaders of the farming community of Chan situated the center of their community in a locally prominent position from which they could see and be seen.

Table 2.1. Mound-group typology for Chan

		Total identified		Total excavated	
Type	Description	*N*	%	*N*	%
1	1 mound, <1 m in height	134	48.7	12	9
2	>2 mounds, <1 m in height, informal layout	66	24.0	4	6.1
3	>2 mounds, <1 m height, formal layout	42	15.3	4	9.5
4	>2 mounds or platforms, 1–2 m in height, mixed layout	21	7.6	3	14.3
5	>4 mounds or platforms, 1–2 m in height, formal layout	9	3.3	2	22.2
6	>4 mounds or platforms, 2–5 m in height, formal layout	2	0.7	1	50
7	>4 mounds or platforms, >5 m in height, formal layout	1	0.4	1	100
Total		**275**	**100**		

The Central Group is one of two mound groups at Chan with predominantly nonresidential architecture. The other is C-039, a type 1 group consisting of a single L-shaped mound in a large open plaza. C-039 is adjacent and adjoins the Central Group to the west, hence we refer to it as the West Plaza (Cap, ch. 8, this vol.). The Central Group is the largest architectural complex and plaza at Chan and its main location for community-level ceremony, administration, and adjudication; it houses a residence and associated ancillary structures for Chan's leading family (Robin et al., chs. 6 and 7, this vol.). It consists of six mounds surrounding a plaza area. All of the mounds and the plaza were excavated. The east and west sides of the plaza are dominated by an E-Group, the east structure of which is Chan's tallest structure, rising to a height of 5.6 m. With the exclusion of a ball court, Chan's Central Group met all the functions of large Maya civic centers, albeit at a smaller scale.

Type 5 and 6 mound groups represent Chan's largest residential platform groups. They consist of formally arranged platform groups with four or more mounds where at least one mound is between 1 and 2 m or more than 2 m, respectively. There are two type 6 mound groups and nine type 5 mound groups at Chan. A type 6 and a type 7 mound group are located just east of and adjacent to Chan's Central Group (C-002 and C-003). These mound groups are the locations of the residential compounds of the extended families of Chan's leaders (Robin et al., ch. 7, this vol.). The remaining type

6 mound group and eight type 5 mound groups are dispersed across the site, located roughly 700 m to 1 km from the Central Group, rather than nucleated around it. As indicated by Chelsea Blackmore's research (ch. 9, this vol.) at a mound group cluster that consists of two type 5, two type 4, three type 3, and two type 1 groups and is located 1 km east of the Central Group (called the Northeast Group), these larger residential platforms are households of head families of subgroups or neighborhoods across Chan.

Type 1 and 2 mound groups are the most common mound groups at Chan. They are located across the entirety of the site. They make up 48.7 percent and 24 percent of mound groups, respectively (see table 2.1). Type 1 and 2 mound groups generally correspond to the humble farming households.

The proportions of mound group types at Chan is generally comparable to those seen across settlement in the Xunantunich polity (compare Neff et al. 1995), except that at Chan smaller mound groups are more prevalent and larger mound groups are less prevalent. Type 1 groups make up 48.7 percent of Chan's settlement and 41 percent of the broader polity settlement. Type 5 to 7 groups make up 4.4 percent of Chan's settlement and 8 percent of the broader polity settlement (Wyatt 2008a: 110).

To explore the range and variability in Chan's settlement we excavated a 10 percent sample of Chan's mound groups, which represents the temporal, socioeconomic, and vocational variability in mound groups at the site (see table 2.1). All ritual, residential, and administrative buildings at Chan's type 7 site center were also excavated.

A Changing Cultural Landscape

At each mound group, surveyors collected diagnostic ceramics from the ground surface, looters' trenches, and any other disturbed area to develop a chronology for the Chan site. Diagnostic ceramics were identified at 45 percent of mound groups (123 of 275 mound groups). Thirty-three of these were originally collected by the Xunantunich settlement survey and analyzed by Jennifer Ehret (Ashmore et al. 1994). Ninety collections were made by the Chan settlement survey and analyzed by Laura Kosakowsky (2007). Elise Docster (2008) incorporated this temporal data into the Chan GIS to develop a spatial model of temporal changes in Chan's settlement.

For each major period of occupation at Chan, we developed minimum and maximum population estimates for an area with a 1 km radius around the Central Group—corresponding to the intuitively and statistically identifiable settlement concentration around that group. This area includes the core of the community and surrounding subgroups. The population estimates should be considered heuristics for understanding how population changed through time at Chan and for comparing Chan's population to that of other communities in the Maya area. In calculating population estimates, several variables need to be considered: number of structures, percentage of structures determined to be residential, percentage of structures dated to the phase in question, percentage of structures inhabited contemporaneously, and number of individuals living in each structure (for example, Beekman 1998; Culbert and Rice 1990).[2] Depending on how one estimates any one of these variables, the projected population estimate can vary widely. Thus, we see generating ancient population estimates not as a means of getting at absolute population levels but as a means of identifying relative population levels for comparative purposes. We used our excavation data to determine what percentage of mounds were residential. (This and other implications of the estimating procedures we used and how these affect the resultant population estimates are discussed in note 2.)

Early Middle Preclassic Occupation (1000/800 BC–650 BC)

Surface collection work did not identify any mound groups dating to the early Middle Preclassic period. Nor did excavations identify any in-situ occupation from this period. But as Laura Kosakowsky discusses in the next chapter, there may have been early ephemeral activity at Chan at this time, as highly eroded sherds from this period were found redeposited in the earliest fill layers. The only early Middle Preclassic ceramics identified at Chan come from the Central Group, suggesting that whatever activity existed in this period was focused on this area.

Middle Preclassic Settlement (650–350 BC; Boden Complex)

The Middle Preclassic is the first major period of occupation at Chan. During this period, 19 percent of mound groups were occupied (figure 2.3). The Central Group was occupied at this time. Perhaps as a founding family at Chan, the Middle Preclassic residents of the Central Group gained access to local resources and authority that helped them expand their position as the community grew (what McAnany [1995] refers to as the "principle of first occupancy"). While their founding status likely had some influence on their subsequent status as community leaders, a "principle of first

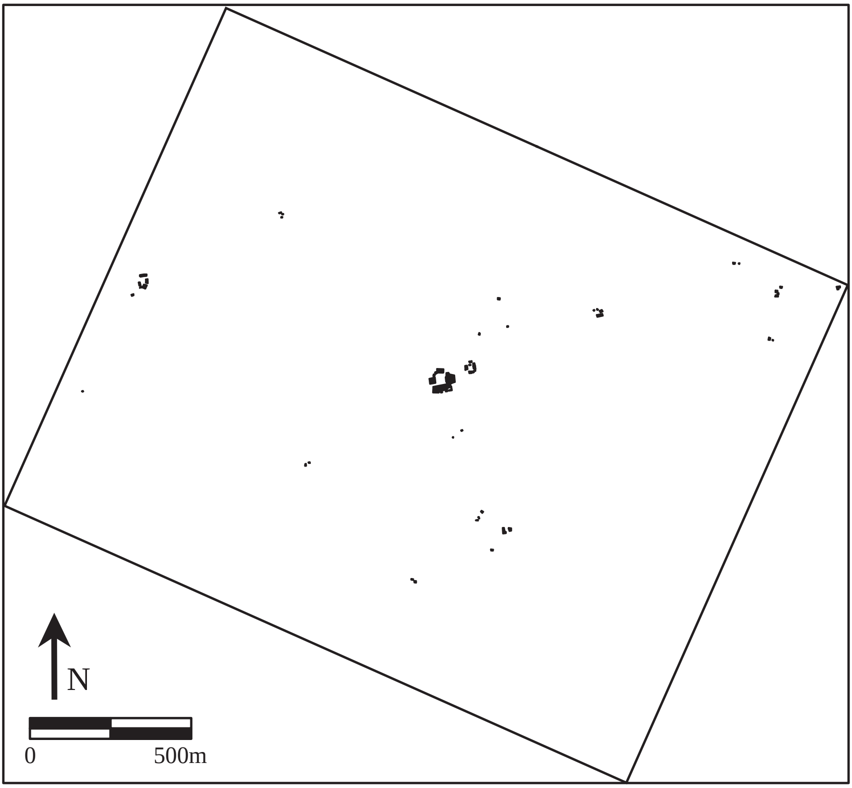

Figure 2.3. Middle Preclassic settlement at Chan.

occupancy" is only an ideal model, and mound groups of all types were initially occupied in the Middle Preclassic at Chan. Other social, economic, political, and religious roles and relations to community members and outsiders were as critical as first occupancy to establishing the authority of Chan's leaders (Robin et al., chs. 6 and 7, this vol.).

In terms of spatial organization, many of the mound groups that were occupied in the Middle Preclassic are clustered around the Central Group. Rather than beginning as a dispersed set of farmsteads that later developed into a more clustered community, as occupation was initiated at Chan in the Middle Preclassic period there was a spatial focus of the community around the Central Group. The status of the Central Group as not only the geographical center of the community but also the social and ritual center of the community beginning in the Middle Preclassic has been substantiated by subsequent excavation research (Robin et al., ch. 6, this vol.).

Between 249 and 418 people may have lived at Chan at this time. But Laura Kosakowsky (2007) cautions that Chan's Middle Preclassic occupation may be overrepresented by our surface collection sampling strategy. A surface collection methodology where only diagnostic ceramics are collected can result in a bias toward time periods that have particularly distinctive diagnostic ceramics. In the Belize Valley, Mars Orange Ware ceramics account for a significant portion of Middle Preclassic ceramics. These are easily identifiable due to their orange paste, which is distinct from the dull gray to tan pastes that make up the majority of later ceramic assemblages. Thus, what is most significant about the distribution of Middle Preclassic settlement at Chan is not the quantity of that settlement relative to other early time periods but the early nature of settlement clustering at Chan, which is indicative of the early development of a community center rather than a later community developing from earlier dispersed farmsteads.

Late Preclassic Settlement (350 BC–AD 100/150; Cadle Complex)

During the subsequent Late Preclassic period, occupation remains fairly constant with 15 percent of mound groups occupied (figure 2.4). Between 196 and 330 people may have lived at Chan at this time. Chan's settlement continued to be spatially clustered around the Central Group, and similar areas of the site were occupied as had been occupied in the preceding Middle Preclassic period. The first ceremonial architecture was constructed at the Central Group at this time.

Terminal Preclassic Settlement (AD 100/150–250; Potts Complex)

During the Terminal Preclassic period, 11 percent of Chan's mound groups were occupied (figure 2.5). Between 144 and 242 people may have lived at Chan at this time. Mound groups continued to cluster around the Central Group, and similar areas of the site were occupied as had been occupied in the preceding Middle and Late Preclassic periods. Laura Kosakowsky suggests that the apparent slight decline in the Terminal Preclassic occupation at Chan may be an artifact of the ceramic analysis. Many Late Preclassic ceramic types continued in use in the Terminal Preclassic, and in the absence of formal characteristics, or types that are present only in the Terminal Preclassic (for example, mammiform supports or San Antonio Golden Brown), some material that is included in the Late Preclassic ceramic counts may in fact represent slightly later occupation. Terminal Preclassic architecture is not underrepresented in excavations at Chan.

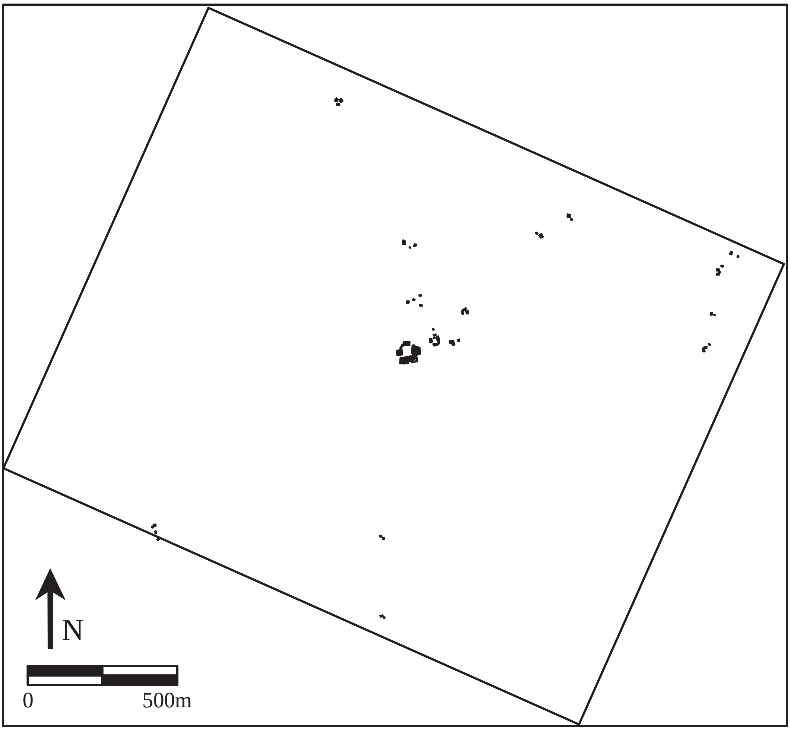

Figure 2.4. Late Preclassic settlement at Chan.

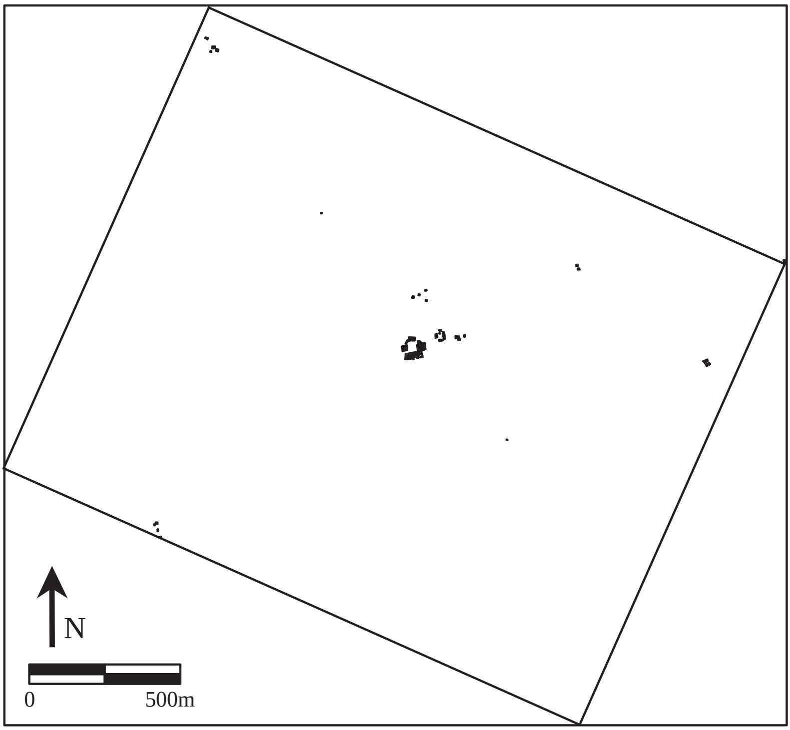

Figure 2.5. Terminal Preclassic settlement at Chan.

Early Classic (AD 250–600; Burrell Complex)

During the Early Classic period, Chan's settlement expanded, with 28 percent of mound groups being occupied (figure 2.6). Between 366 and 615 people may have lived at Chan at this time. Mound groups continued to cluster around the Central Group, and others were newly constructed across the extent of the community. This is the first period in which Chan's residents constructed mound groups across what would become the full spatial extent of the community at its population maximum in late Late Classic times. Evidence for settlement expansion at Chan in the Early Classic is significant because there is a general paucity of Early Classic ceramics reported at Belize Valley sites. It is also important to note here that excavations at Chan yielded comparable evidence for Early Classic material in both ceremonial and domestic contexts (Kosakowsky, ch. 3, this vol.). The paucity of Early Classic ceramics reported at Belize Valley sites has led to a debate in the literature over whether the Early Classic was a period of depopulation in the Belize Valley or if researchers are not recognizing the ceramic assemblages of this time period, as elite pottery types from the central Petén region have primarily been used to identify the Early Classic (Awe 1992; Demarest 1992; Ford 1991; LeCount 2004a; Lincoln 1985). While the evidence from Chan does not resolve this debate, it does demonstrate that at Chan populations did not decrease in the Early Classic and that Early Classic commoner domestic assemblages from outside of the central Petén area are identifiable archaeologically. As archaeologists excavate more commoner domestic assemblages, our understanding of the Early Classic in the Belize Valley will become clearer.

Early Late Classic (AD 600–670; Jalacte Complex)

During the early Late Classic period, settlement continued to expand across the entirety of the site as the number of mound groups occupied increased to 37 percent (figure 2.7). Between 484 and 813 people may have lived at Chan at this time.

Late Late Classic (AD 670–800/830; Pesoro Complex)

During the late Late Classic period, Chan's settlement reached its peak with 76 percent of Chan's mound groups being occupied (figure 2.8). Between 994 and 1,670 people may have lived at Chan at this time. The end of the

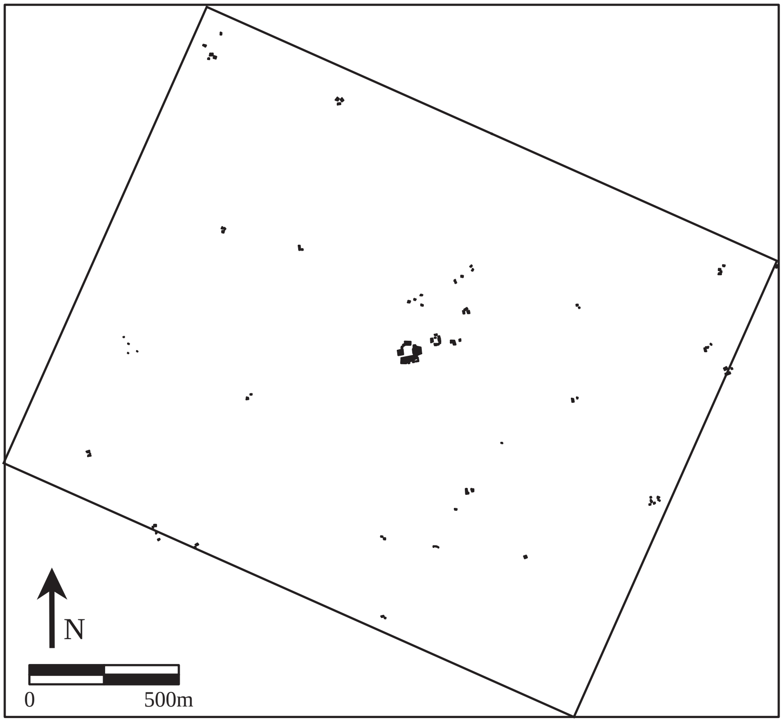

Figure 2.6. Early Classic settlement at Chan.

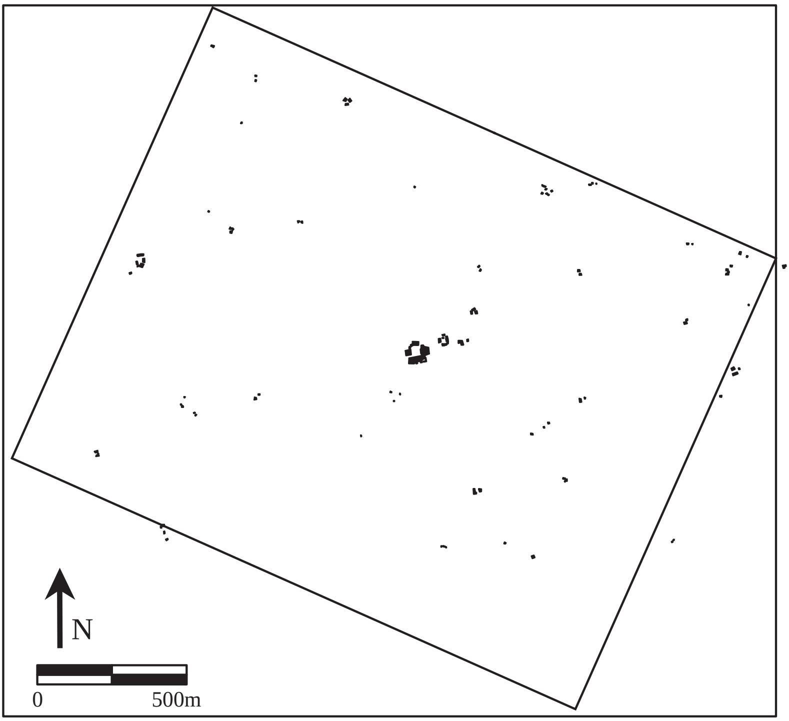

Figure 2.7. Early Late Classic settlement at Chan.

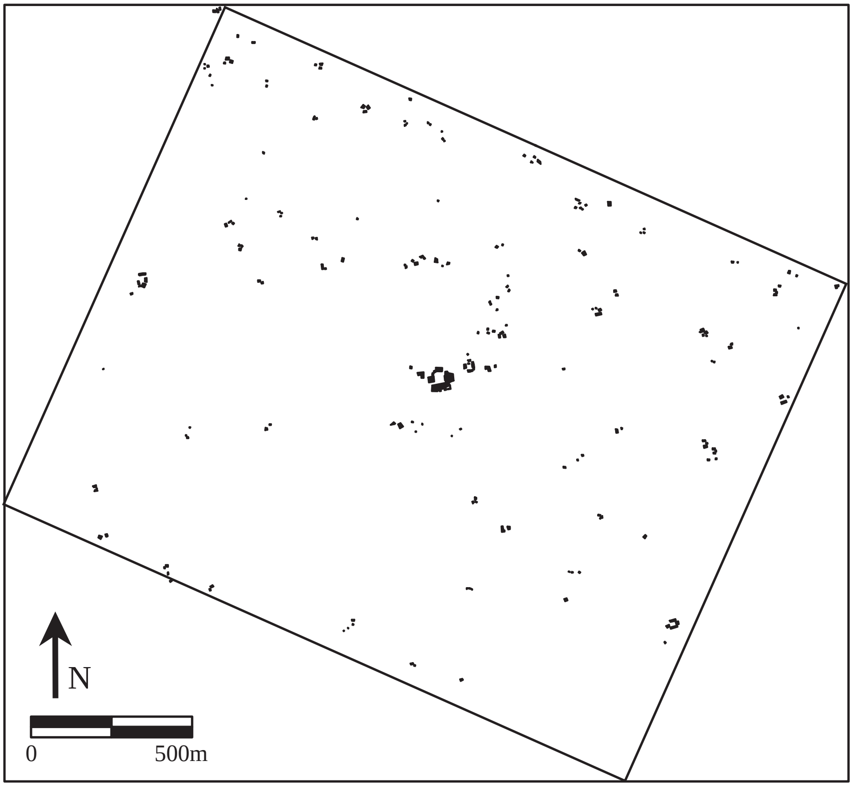

Figure 2.8. Late Late Classic settlement at Chan.

Late Classic period is not only the settlement maximum at the site, it is also the period in which the largest ceremonial and administrative architecture was constructed (Robin et al., ch. 6, this vol.) and when there was the largest expansion of agricultural terraces (Wyatt, ch. 4, this vol.). Chan's settlement peak at the end of the Late Classic period is concurrent with the short-lived florescence of the polity capital of Xunantunich. Located only 4 km northwest of Chan, Xunantunich and Chan are within a few hours' walk of each other. The main temple at Xunantunich could have been seen from most locales at Chan in the late Late Classic period and likely served as a regionally important ritual venue for at least certain members of the Chan community. That there would be some relationship between Chan and the polity capital of Xunantunich is perhaps unquestionable given the proximity of the two sites. The question that emerges is what was the nature of the relationship between Chan and Xunantunich?

In terms of settlement patterns, the Late Classic period was a period of major settlement expansion across the Maya lowlands (Culbert and Rice 1990). Thus, it is reasonable to question to what extent did Chan's settlement expansion relate to the florescence of Xunantunich or to broader developments in the Maya area (or both)? Settlement survey research in areas adjacent to the Belize Valley center of Buenavista, which saw its peak of power in the early Late Classic just prior to the florescence of Xunantunich, by both the Mopan Valley archaeological project (Yaeger et al. 2009) and the Xunantunich settlement survey (Ehret 1995; Yaeger 2008) has documented that these settlement areas reached their settlement maximums in the early Late Classic rather than the late Late Classic. In some settlement areas around Buenavista, occupation remained high at the end of the Late Classic period, while in others such as Callar Creek, the largest architectural complex between Buenavista and Actuncan, settlement dropped at the end of the Late Classic period. Shifts in regional authority, as well as broader settlement trajectories, influenced settlement in the Belize Valley.

Correlations between shifts in settlement patterns and changes in regional authority are not equivalent to causation (see Erickson 2006 for a discussion of the pitfalls of assuming relationships of coexistence and causation are one and the same). Land, labor, agricultural produce, and historical ties to local people and places are some of the resources visible in settlement pattern studies that Chan possessed which may have been significant in the rise of Xunantunich. Understanding the possible interconnections and avenues of influence between the two sites is an area of our subsequent excavation research.

Terminal Classic (AD 800/830–900; Vieras Complex)

During the Terminal Classic period, Chan's settlement declined, with 29 percent of mound groups occupied (figure 2.9). Between 379 and 637 people may have lived at Chan at this time. In terms of both density and spatial distribution, Chan's Terminal Classic settlement pattern is most similar to its Early Classic settlement pattern. Although the number of mound groups occupied in the Terminal Classic declined significantly, we do not see a contraction of Chan's settlement in terms of spatial extent of its settlement, as the full spatial extent of the community remained occupied. During the Terminal Classic period, Xunantunich's power was waning and settlements across the Belize Valley and across the southern lowland Maya area were

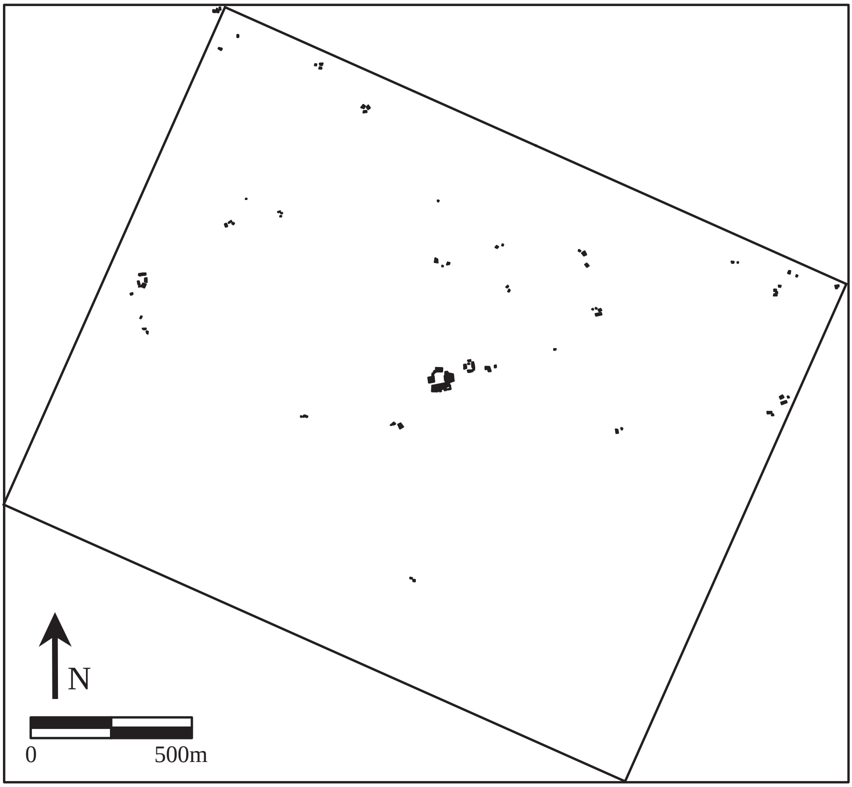

Figure 2.9. Terminal Classic settlement at Chan.

in decline. Chan's Terminal Classic settlement decline is comparable to that seen at other Belize Valley sites and many across the southern lowland Maya area and is concurrent with the decline of Xunantunich. But Terminal Classic settlement patterns at Chan do not suggest a straightforward decline of community. Certainly Chan's residents were leaving. But the similarities in Chan's Terminal Classic and Early Classic settlement patterns suggest that although a significant decline in the amount of settlement at Chan in the Terminal Classic period can be seen, the basic organization of the community may have endured. The Central Group remained the focus of settlement and all areas of the site were occupied, albeit at lower levels of occupation.

Early Postclassic Settlement (AD 900–1150/1200)

Surface collections identified only one mound group that was occupied in the Early Postclassic period: mound group C-301, a small type 1 single

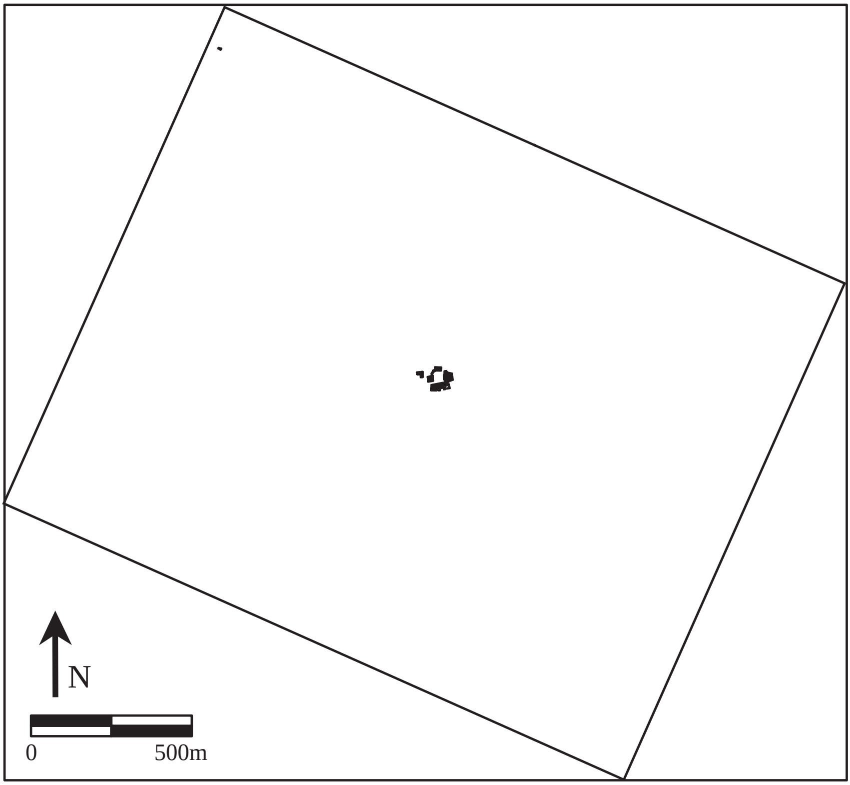

Figure 2.10. Early Postclassic settlement at Chan. Surface collections identified Early Postclassic occupation only at mound group C-301, located at the edge of the site 1 km to the northwest of the Central Group. Excavations subsequently identified an Early Postclassic ceremonial complex in the Central Group and adjacent West Plaza.

mound group located at the edge of the site 1 km to the northwest of the Central Group (figure 2.10). Excavations have subsequently identified an additional Early Postclassic ceremonial complex in the Central Group and adjacent West Plaza (chapters 3, 6, 8, 15). It is unlikely that Chan was a full community at this time. A few families remained in the Chan area in the Early Postclassic, and its community center continued to be an important locus of ritual activity for the scattered farmsteads that occupied this part of the upper Belize Valley at this time.

Conclusion

Chan is a farming community with a 2,000-year history. Its residents lived in perishable houses built on low masonry substructures (mounds). The farmstead was the basic settlement unit at Chan, as farmers lived in the midst of their agricultural terraces. Chan's landscape was heavily terraced, in fact, more so than other areas of the Belize Valley, which itself is known for high agricultural productivity, making Chan an important focus of agricultural activity in this agriculturally productive region. Terraces were more numerous and often larger than residences at Chan, making them a primary focus of construction activity for residents. Terraces were constructed up and down hillslopes and across ravines, producing a landscape that would have looked like green stepped pyramids across the site.

While agriculture was the primary livelihood of the majority of Chan's residents, agriculture was not the only productive activity going on in this farming community. Settlement survey research identified evidence for biface production and limestone quarrying, and subsequent excavations documented shell working and obsidian blade production.

The initial Middle Preclassic community was focused around the Central Group (C-001) located at the spatial and geographical center of the community on a locally high promontory. Rather than beginning as a dispersed set of farmsteads that later would develop into a more clustered community, as occupation was initiated at Chan in the Middle Preclassic there was a spatial focus to the community around the Central Group. The Central Group became the main focus of ceremonial and administrative activity at Chan and a residence of its leading families as the site grew and developed through time. A "principle of first occupancy" is one of the mechanisms, but not the only one, through which Chan's leading families came to wield authority.

Across the course of its 2,000-year history, Chan's settlement and population expanded. Its residents would have interacted, directly and indirectly, through social, political, and economic networks, with residents of numerous neighboring civic-centers in the Belize River area such as Xunantunich, Dos Chombitos, Cahal Pech, Actuncan, Buenavista, Las Ruinas, Blackman Eddy, and Guacamayo. Through time, Chan's residents developed ties to other residents across the region. In the late Late Classic period, a correlation between settlement expansion at Chan and political assertion at Xunantunich and the proximity between the two sites suggests some kind of relationship between the late-rising polity capital and the farming community but not the nature of that relationship, the latter of which is one of the avenues of our excavation research.

Although it never became a large site, Chan has a long continuous occupation history that spans two millennia. Through time Chan weathered the rise and fall of neighboring civic-centers and broader political-economic changes in Maya society. In the Terminal Classic period, its last major period of occupation, settlement had declined significantly, but the spatial organization of the community and its focus on the Central Group remained intact.

Notes

1. Since the work of Gordon Willey, ancient settlements in the Belize River area have received significant attention from scholars, generating useful methods and models for our research (Ashmore et al. 1994, 2004; Awe 1992; Ball and Taschek 1991; Chase and Garber 2004; Ford 1990; Ford and Fedick 1992; Lucero et al. 2004; Yaeger et al. 2009). The Chan settlement survey methodology draws heavily from the collective strengths of these previous projects but draws most significantly from the work of the Xunantunich settlement survey, which refined survey techniques for the Xunantunich polity research area (Ashmore et al. 1994, 2004; Ehret 1995; Neff et al. 1995; Robin 1999; Yaeger and Connell 1993). We adapted the transect-coverage survey procedures developed by the Xunantunich settlement survey for a full-coverage survey of the Chan site to facilitate comparability with this broader regional database.

We maintained the 400 m wide survey transect as our basic sampling unit and divided the Chan survey area into 400 m wide units. Each 400 m wide sampling unit consisted of a central survey line (*brecha*) with 200 m long perpendicular survey lines (*picados*) placed at 20 m intervals extending both directions from the main *brecha*. The 400 m wide transects were used in the regional survey of the Xunantunich polity because this transect width could capture whole ancient social and settlement units more fully than narrower transects. Additionally, 400 m wide transects were useful because the 200 m length of a *picado* is roughly the longest distance that a machete cutter can cut and maintain a straight line by eye and keep a consistent distance over terrain of quite varying slopes through pace measurement (Ashmore et al. 1994; Neff et al. 1995). It is this latter utility that prompted us to divide Chan's settlement into 400 m wide survey units for the purposes of a full-coverage survey.

Three survey techniques, topographic mapping, archaeological reconnaissance, and surface collection were employed to collect information on natural features (land formations, vegetation, environment), cultural features (architecture, agricultural fields, other human constructions), and chronology (relative dating of archaeological features through surface collection ceramics). In this way we were able to document the cultural and natural terrain of Chan and understand its chronological, functional, and socioeconomic dimensions. The field survey at Chan was conducted in four phases. First surveyors cut, using machetes, *brechas* and *picados* through the contemporary vegetation around Chan, which consists largely of areas of mature forest, new forest, and secondary growth, as well as a more limited amount of pasture. Surveyors then walked the *brechas* and *picados* and the areas between them to visually inspect the extent of the survey area to locate cultural and natural features. Surveyors initially recorded all cultural features using a Brunton compass and collected surface collections while making their preliminary maps. Finally, the precise location of cultural and natural features and topography was digitally recorded using a Topcon GTS 605 laser theodolite.

The digital recording of settlement data allowed for the production of accurate computer-based models of Chan's settlement. Geographical Information Systems (GIS) are the most recent innovation in computer-based archaeological settlement mapping. Because GIS enables archaeologists to bring together and analyze ancient cultural and natural landscapes, it is an ideal presentation format for archaeological settlement survey work. Elise Docster (2008) created the Chan GIS by importing 3D point data collected during the survey into the GIS program. To construct the topography, she used the SPLINE function to create a Raster map of the 3.2 km surveyed topography. She created shapefiles for each cultural and natural feature and joined the quantitative and qualitative database information collected during the survey to each individual shapefile. In this chapter, we employ the Chan GIS model to visualize and interpret temporal changes in settlement survey data.

2. Given that 562 mounds were identified across the 3.2 km Chan survey area, we estimate that there were 552 mounds within a 1 km radius of the Central Group. Detailed excavations at a 10 percent sample of Chan's mound groups allowed us to gauge what percent of these structures were residential. Twelve type 1 single mounds were investigated. Of these, full-scale horizontal excavations were undertaken at eight type 1 mounds. The remaining type 1 mounds were investigated only through extramural post-hole testing. Of the eight intensively excavated type 1 mounds, seven were residential (Kestle, ch. 11, this vol.; Robin 1999, 2002a; Wyatt, ch. 4, this vol.) and one was nonresidential (Cap, ch. 8, this vol.). Thus, for the purpose of calculating populations, we estimate that seven-eighths of type 1 mounds were residential.

At the other end of the scale of mound groups at Chan, its single type 7 Central Group was mapped with nine mounds, only one of which was residential (Robin et al., ch. 6, this vol.); thus, for this group we include only one residential mound in our population estimates. For type 4 to 6 mound groups, which represent the households of head or higher-status families across Chan (Blackmore, ch. 9, this vol.; Robin et al., ch. 7, this vol.), two-thirds of mounds were residential and one-third were ancillary structures based on excavation data. For type 2 mound groups where all mounds in a group were excavated, in two cases all mounds were residential (Robin 1999, 2002a) and in one case one mound was residential and one was an ancillary structure (Hearth, ch. 10, this vol.). For the type 3 mound groups we investigated, investigations did not explore all mounds in a group (Blackmore, ch. 9, this vol.; Kestle, ch. 11, this vol.). For type 2 to 3 mound groups, we estimate that five-sixths of mounds were residential.

Our extensive program of post-hole testing that extended from the architectural cores of mound groups for 30 to 50 m beyond the architectural core and in two cases extended across whole neighborhoods allowed us to explore the possible existence of nonmound architecture (Blackmore, ch. 9, this vol.; Hearth, ch. 10, this vol.; Robin 1999, 2002a; Robin et al., ch. 7, this vol.). Indeed, a number of nonmound structures were identified through post-hole testing, but all of these were ancillary structures; they include the lithic workshop within mound group C-199 (Hearth, ch. 10, this vol.) and the ancillary structures in the humble farming mound groups located south of the Central Group (Robin 1999, 2002a, and ch. 1, this vol.). We do not believe that substantial numbers of residences were missed by our survey.

Using the figures discussed above, we estimate that there were 436 residential mounds within a 1 km radius of the Central Group. This number of mounds is derived from the number of mounds present in a group at the end of its occupation history; thus, it may overrepresent the number of mounds in a group from earlier periods of Chan's occupation. Given that deeply buried earlier architecture is likely to be underrepresented in our surface collection samples, we feel it is appropriate to use mound counts based on the number of mounds present in a group at the end of its history as a proxy for all time periods.

Not all residences in a community will be inhabited contemporaneously, particularly where there are extended family compounds and perishable houses, as at Chan. The residence of an older couple in a compound, upon their death, may go out of use for a time. Likewise, the residence of a young family may go out of use for a time when they move elsewhere in the community or to another community and start their own house compound. Given these issues of the developmental cycling of households and families (Goody 1971), an estimate of contemporaneity must be factored into population estimates. Recently Mesoamericanists have used estimates ranging from 75 percent (Beekman 1998) to 90 percent (Tourtellot 1990) to account for the numbers of residences that may be unoccupied in a community at any one time. Initially, scholars used much lower figures; for example, Ricketson and Ricketson (1937) considered that only 25 percent of mounds were occupied contemporaneously at Uaxactun. But these lowest-end figures assume that swidden farming was practiced, which was certainly not the case at Chan. We used 75 percent and 90 percent to calculate our minimum and maximum population estimates.

Mayanists typically estimate that between 4 and 5.6 persons lived in an ancient house based on a range of ethnographic and environmental analogies (Beekman 1998; Rice and Rice 1990; Tourtellot et al. 1990; Webster and Freter 1990). We employed both figures to generate our minimum and maximum population estimates.

We advocate a model of continuous occupation (Tourtellot 1990); thus, we did not standardize our residence counts based on length of occupation phase. Temporal standardization has the effect of making population estimates unrealistically low for the long temporal spans of the Preclassic period. But as a result, our estimates for Chan's population at its peak in the late Late Classic period may overestimate population. To calculate a minimum population estimate we used the following equation: 452 residential mounds × percent dated to phase × 75 percent contemporaneity × 4 persons per residence. For our maximum estimate we used 452 residential mounds × percent dated to phase × 90 percent contemporaneity × 5.6 persons per residence.

3

Ceramics and Chronology at Chan

LAURA J. KOSAKOWSKY

Ancient Maya ceramics historically have been the basis for developing chronological frameworks because of their relative abundance and durable preservation in archaeological sites. To this end, the ceramics excavated from Chan (Kosakowsky 2006, 2007, 2008, 2009) were analyzed to identify site-specific ceramic complexes utilizing standard type: variety-mode designations for Maya pottery (Gifford 1976). The identification of ceramic types, varieties, and modes not only has the advantage of informing on the temporal placement of the occupation and construction history at the site but also allows us to view Chan in a regional and interregional perspective. The ceramics from Chan present a unique opportunity to describe a long sequence from an agrarian community and to examine the interactions with and the role of larger centers, both near and far, in the development of the community. Using an approach that combines type-variety and modal analyses as a primary step in the categorization of the Chan ceramics can elucidate these temporal patterns, as well as patterns in production, consumption, and exchange; assess the relative social status and economic wealth of the inhabitants of Chan; and place Chan within a geopolitical landscape.

Methodology

The ceramic analysis began with the relatively small collection of whole and partial vessels (see chapter 15) but was principally focused on the rim and diagnostic body sherds totaling 39,042 from the entire sample of approximately 321,000 (see table 3.3, located at the end of this chapter). The remaining sherds include numerous slip-eroded sherds that were identifiable only to time period based on vessel form but not classified by type and variety, as well as any unslipped and eroded body sherds. Analyses were conducted by stratigraphic sequences for all excavation operations, beginning with the lowest levels of each excavation and moving upward.[1] All lots, with the exception of surface and looted material, were analyzed to the ceramic varietal level by presorting into ceramic groups with identifiable surface finish and decoration. Sherds that were identifiable to ceramic complex on the basis of vessel form were counted but not included in the totals in table 3.3. The slip-eroded and unslipped body sherds that were not identifiable were counted and rebagged, in order to get some measure of what percentage of each lot was identifiable. The complete analysis proceeded using all rim sherds and body sherds with identifiable surface finish, decoration, or formal characteristics; body sherds recognized on the basis of paste characteristics (such as Mars Orange or Holmul Orange Wares, British Honduras Volcanic Ash Wares, and Vinaceous Tawny Wares, all of which are easily identifiable in the absence of preserved surfaces) were also included in the analysis.

While the classification of Maya pottery using type: variety-mode as a framework has received much critical debate (Adams 2008; Culbert and Rands 2007), it has proven useful as a common language of communication among archaeologists and allows one to describe large samples with relative ease. Furthermore, the identification of ceramic types and varieties facilitates both chronological assessments and spatial associations through comparisons of similar units across time and space. Thus, type: variety-mode classifications are successful tools for dating deposits, structures, and sites, but they also permit broader goals of understanding relationships within and between communities that relate to social and economic activities (as described in chapter 15). Historically, Maya pottery analysis in the Belize Valley has been structured largely on Gifford's seminal work (1976) on the Barton Ramie ceramic sequence. While it is a foundation for looking at pottery from other sites in the Belize Valley and beyond, researchers are sometimes too prone to assume a one-to-one correlation between the ceramics at their site and Barton Ramie (see the discussion of what has been described as "the Barton Ramie paradigm" by Ball and Taschek [2003]). As a result, archaeologists often overlook the importance of interregional geopolitical associations and connections to sites outside the Belize Valley. In this chapter, I first summarize the ceramic sequence through time at Chan and then relate the Chan pottery, throughout its 2,000-year history, to ceramics found at other sites throughout the Maya lowlands.

The Chan Ceramic Complexes

Chan was occupied (table 3.1) from the Early Middle Preclassic (ca. 800 BC) until the Early Postclassic (ca. AD 1200), although the major occupation falls between the Middle Preclassic (650 BC) and Terminal Classic (AD 900), with only sparse evidence for the earliest phase and a population decline in the Terminal Classic, followed by abandonment in the Early Postclassic period. A series of calibrated radiocarbon dates (table 3.2) places the earliest construction levels between 780 BC and 410 BC (2-sigma), and the latest between AD 770 and AD 980 (2-sigma).

There may have been an earlier ephemeral occupation, as the earliest ceramics encountered in the Chan collection do include a small number of highly eroded sherds, identified on the basis of paste characteristics, that were redeposited in later mixed deposits. Though relatively few in number, they relate to the Early Middle Preclassic Cunil Complex material. Cunil pottery has been identified elsewhere in the Belize River valley (Awe 1992; Cheetham 1996; Cheetham and Awe 2002; Garber et al. 2002, 2004; Strelow and LeCount 2001), as well as farther away in the Petén (Callaghan 2008). Excavations at Blackman Eddy (Garber et al. 2002, 2004) have confirmed the stratigraphic priority in the Early Middle Preclassic of the Cunil-equivalent Kanocha ceramics; however, at this time there is too little "Cunil/Kanocha"-related material in the Chan collections (and none of that is from a single-phase deposit) to identify a complete ceramic

Table 3.1. Chronology chart detailing the ceramic complexes from the Chan site

	Calendar years[a]	Chan ceramic complexes[b]
Early Postclassic	AD 900–1150/1200	(Not a complete complex)
Terminal Classic	AD 800/830–900	Vieras
Late Late Classic	AD 670–800/830	Pesoro
Early Late Classic	AD 600–670	Jalacte
Early Classic	AD 250–600	Burrell
Terminal Preclassic	AD 100/150–250	Potts
Late Preclassic	350 BC–AD 100/150	Cadle
Middle Preclassic	650–350 BC	Boden
Late Early Preclassic/ Early Middle Preclassic	1000/800–650 BC	(Not a complete complex)

a. Calendar years are approximate dates based on correlation with other sites in the Maya lowlands. See table 3.2 for radiocarbon dates.

b. Chan ceramic complexes are named for geographic bodies of water in and around the Belize Valley.

Table 3.2. Summary of radiocarbon dates from the Chan site

Laboratory number	Provenience	Structure	Material	Context	Ceramic complex	Conventional date	Calibrated age	2–σ range
Beta-256798	1.AA.6	Structure 1	Carbonized wood	Fill	Boden	2480±40 BP	BC 740, 690, 660, 640, 550	BC 780–410
Beta-256803	12.R.13	Structure 6	Carbonized wood	Fill	Boden/Cadle	2210±40 BP	BC 350, 290, 220	BC 390–170
Beta-256809	6.BBB.8	Structure 5	Carbonized wood	Fill	Boden/Cadle	2200±40 BP	BC 350, 300, 210	BC 380–170
Beta-256797	6.MMM.12	Structure 5	Carbonized wood	Burial 10	Cadle	2270±40 BP	BC 380	BC 400–340; BC 320–210
Beta-256801	13.U.1	Structure 7	Carbonized wood	Burial 14	Cadle	2180±40 BP	BC 340, 330, 200	BC 370–150; BC 140–110
Beta-256812	6.Y.27	Structure 5	Carbonized wood	Cache 8	Cadle	2250±40 BP	BC 370	BC 400–200
Beta-256808	6.OOO.3	Structure 5	Carbonized wood	Burial 9	Cadle	2290±40 BP	BC 390	BC 400–350; BC 290–220
Beta-278921	13.W.2	Structure 7	Human tooth	Burial 16	Cadle	2440±40 BP	BC 520	BC 760–400
Beta-256802	13.W.3	Structure 7	Carbonized wood	Burial 16	Cadle	2460±40 BP	BC 720, 700, 540	BC 770–410

(*continued*)

Table 3.2.—*Continued*

Laboratory number	Provenience	Structure	Material	Context	Ceramic complex	Conventional date	Calibrated age	2–σ range
Beta-278922	13.BB.2	Structure 7	Human tooth	Burial 17	Cadle	2050±40 BP	BC 50	BC 170–AD 30
Beta-256805	13.BB.1	Structure 7	Carbonized wood	Burial 17	Cadle	2540±40 BP	BC 770	BC 800–720; BC 700–540
Beta-256811	6.YY.30	Structure 5	Carbonized wood	Burial 8	Cadle	1980±40 BP	AD 20	BC 50–AD 90
Beta-256806	6.YY.23	Structure 5	Carbonized wood	Burial 6	Potts	2040±40 BP	BC 40	BC 170–AD 50
Beta-256815	6.U.4	Structure 5	Carbonized wood	Burial 2	Potts/Burrell	1770±40 BP	AD 250	AD 140–380
Beta-278920	13.T.1–2	Structure 7	Human tooth	Burial 12	Burrell	1610±40 BP	AD 420	AD 380–550
Beta-278924	10.XX.4	Structure 8	Human tooth	Burial 20	Burrell	1550±40 BP	AD 540	AD 420–600
Beta-278919	6.KKK.16	Structure 5	Human tooth	Burial 7	Jalacte	1510±40 BP	AD 560	AD 430–640
Beta-278923	10.WW.3	Structure 8	Human tooth	Burial 19	Jalacte	1420±40 BP	AD 640	AD 570–660

Beta-278918	6.FFF.1–2	Structure 5	Human tooth	Burial 3.4	Jalacte/ Pesoro	1350±40 BP	AD 660	AD 640–710; AD 750–760
Beta-278917	6.FFF.1–2	Structure 5	Human tooth	Burial 3.2	Pesoro	1230±40 BP	AD 780	AD 680–890
Beta-256810	6.FFF.2	Structure 5	Carbonized wood	Burial 3.2	Pesoro	1170±40 BP	AD 880	AD 770–980
Beta-256813	6.J.6	Structure 5	Carbonized wood	Cache 17	Pesoro	1260±40 BP	AD 720, 740, 770	AD 660–880
Beta-256814	6.H.5	Structure 5	Carbonized wood	Terminal Deposit 3	Vieras	1150±40 BP	AD 890	AD 780–980
Beta-256804	12.U.1	Structure 6	Carbonized wood	Cache 22	Vieras	1170±40 BP	AD 880	AD 770–980

complex at the site. Type: variety designations and counts within ceramic groups, using established types, are presented in table 3.3 only for complete Chan ceramic complexes, which are discussed in a broader comparative framework below.

Middle Preclassic Boden Ceramic Complex (650–350 BC)

Middle Preclassic Boden Complex ceramics are found in single-phase contexts in the lowest levels of excavations in the Central Plaza and in the earliest levels of the north and south structures of the Central Group (Structures 2 and 6). Boden pottery is present also in mixed deposits in all structures in the site center, as well as in the settlement area, with the earliest radiocarbon date indicating an initial construction in the site center between 780 and 410 BC (2-sigma). Typical of other sites in the Belize Valley with Middle Preclassic occupation (Gifford 1976), this complex comprises pottery primarily from the Jocote Orange-brown and Savana Orange Groups (figure 3.1a,b) and secondarily includes small quantities of the Joventud Red, Pital Cream, Chunhinta Black, Muxanal Red-on-cream, and Sayab Unslipped Ceramic Groups (table 3.3). The relatively large quantity of Boden ceramics (*N*=8,047) is likely an artifact of the high number of sherds of the Savana Orange Group (totaling 5,418), which are composed of an extremely soft paste. Mars Orange Ware paste erodes easily and results in many small sherds, artificially elevating the count. Characteristic vessel forms include flat-bottomed dishes with everted rims (sometimes with groove-incising), unslipped jars with outcurving necks (and characteristic appliqué fillets), small incurving bowls and *tecomates*, and ovate-spouted vessels, with stirrup handles.

The Boden Complex appears similar in its composition to the Jenney Creek Ceramic Complex at Barton Ramie (Gifford 1976). However, as there are also examples of Muxanal Red-on-cream, the Chan collection supports prior suggestions (Ball and Taschek 2003) that the Middle Preclassic ceramics in the Belize Valley include a blend of pottery from a number of different ceramic spheres. Muxanal Red-on-cream pottery is found throughout Mamom Sphere sites in northern Belize, the Petén, and the Yucatan (Adams 1971; Ball 1977; Kosakowsky and Pring 1998; Rice 1979; Smith and Gifford 1966).

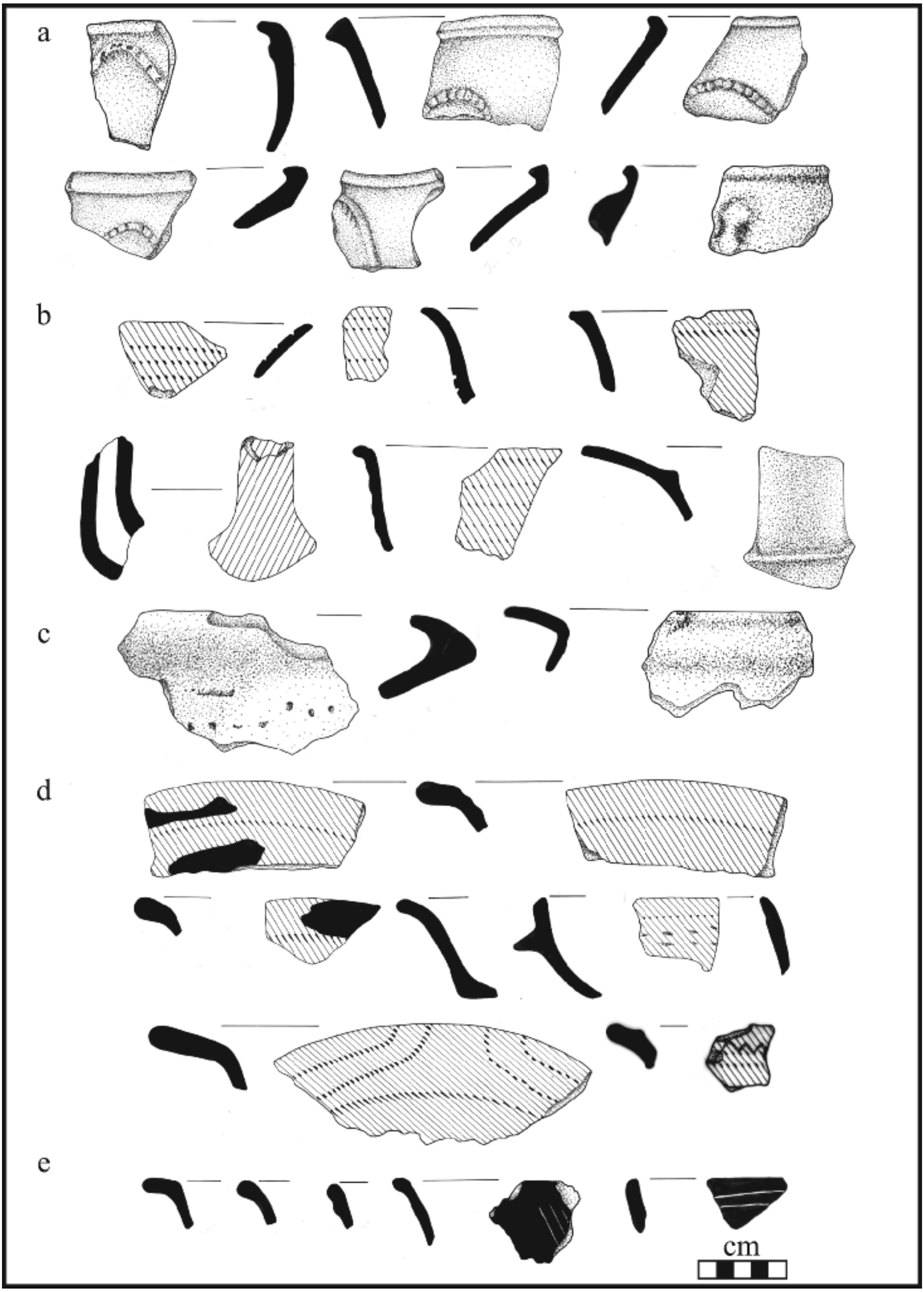

Figure 3.1. Major types and forms of the Boden and Cadle Ceramic Complexes: (a) Jocote Orange-brown Group; (b) Savana Orange Group; (c) Paila Unslipped Group; (d) Sierra Red Group; and (e) Polvero Black Group. (Illustrations by Carmen Ting.)

Late Preclassic Cadle Ceramic Complex (350 BC–AD 100/150)

There is abundant evidence for Late Preclassic Cadle occupation in the Chan ceramic collections, encountered in all site center excavations in mixed and unmixed contexts, as well as in the settlement area. A series of radiocarbon dates from site center burials and caches (see table 3.2), excavated from both the east (Structure 5) and the west (Structure 7) structures of Chan's E-Group, brackets Late Preclassic construction between the fourth century BC and the second century AD but is complicated by a number of samples where earlier wood appears to have been recycled in later burial fills.

The Cadle Complex includes ceramics from the Sierra Red and Paila Unslipped Ceramic Groups (figure 3.1c and d), as well as smaller quantities from the Polvero Black (figure 3.1e), Flor Cream, Matamore Dichrome, Hillbank Red, and Sapote Striated Groups (table 3.3). The whole vessels from the E-Group burials and caches (chapter 15), and abundant sherd material, are typical of Late Preclassic pottery found throughout lowland Maya sites of the Chicanel Sphere and include numerous examples from the Sierra Red Ceramic Group. Forms typically include outcurving bowls and buckets, outcurving necked jars, and incurving bowls with medial or labial flanges, and decorative modes include incising, punctation, and appliqué.

However, some of the Chan ceramics lack the diagnostic waxy lustrous surfaces that characterize the Sierra Reds of the Paso Caballo Waxy Wares in the Petén (Smith 1955) and appear to be related more closely to Hillbank Red, a type described as having a red-orange slip by Gifford (1976) in the Barton Creek Complex at Barton Ramie. The Chan examples are more red than red-orange in color, and some of these Sierra and Hillbank Red sherds pertain to the latter part of the Late Preclassic or even to the Terminal Preclassic time period. The fact that Gifford (1976: 101) noted both tetrapodal as well as nubbin feet on Hillbank Red at Barton Ramie, vessel appendages more commonly associated with Terminal Preclassic ceramics, confirms this placement in the latter part of the Preclassic. The continuation of Late Preclassic slips into the Terminal Preclassic and even the Early Classic periods, particularly on monochrome red vessels, is well documented at Maya sites in northern Belize (Kosakowsky and Sagebiel 1998; Sullivan and Sagebiel 2003) and the northern Petén (Adams 1971), and in some instances this pottery possesses surfaces that presage the glossiness of Early Classic Petén Gloss Wares and represent a period of experimentation and innovation in ceramic manufacture, as well as elaboration of vessel forms from the preceding period.

Terminal Preclassic Potts Complex (AD 100/150–250)

At Chan, the Terminal Preclassic Potts Ceramic Complex is present in small quantities, in mixed contexts throughout all site center excavations, as well as in the settlement area. Radiocarbon dates from two Potts burials in the east structure of the E-Group (see table 3.2) date to between BC 170–AD 50 and AD 140–380 at the 2-sigma range. The Potts Complex includes pottery of the Sierra Red, Polvero Black, Flor Cream, Matamore Dichrome, Hillbank Red, and Paila Unslipped Groups (figure 3.2a,b,d,e), which continued in use from the Late Preclassic, along with the introduction of the Monkey Falls Striated, Cabro Red (figure 3.2c), San Felipe Brown, Quintal Unslipped (*incensarios*), Escobal Red-on-buff (rare), and Sarteneja Usulután (rare) Groups, all part of the Paso Caballo Waxy Ware tradition (table 3.3). The relatively low quantity of Potts ceramics (*N*=2,291) compared with the Cadle pottery (*N*=5,102) of the preceding complex is in large measure due to the continuation of some types, resulting in the underestimation of Terminal Preclassic sherds in the absence of vessel form identification.

The Potts Complex also is marked by the appearance of small quantities of the Aguacate Ceramic Group (figure 3.2g; Gifford 1976), although in keeping with others (Brady et al. 1998) I include only the monochrome types in the Aguacate Group and place all transitional and later polychrome material in the Early Classic Petén Gloss Wares. Vessel forms include the introduction of the basal flange bowl on Sierra Red types and a few examples of Z-angle bowls and mammiform tetrapod supports, all hallmarks of this time period at other lowland Maya sites (Pring 2000). The Potts Complex at Chan combines types and forms of the Mt. Hope and Floral Park Ceramic Complexes from the nearby site of Barton Ramie in the Belize Valley (Gifford 1976), as well as aspects of the Cimi Complex at Tikal (Culbert 1993), confirming its temporal placement between the last century BC and the second or third century AD, and Chan's continuing participation in wide-ranging ceramic interaction spheres.

Early Classic Burrell Ceramic Complex (AD 250–600)

The Early Classic Burrell Ceramic Complex at Chan is represented by a blend of ceramics (figure 3.2h–k) commonly found at Petén sites (Culbert

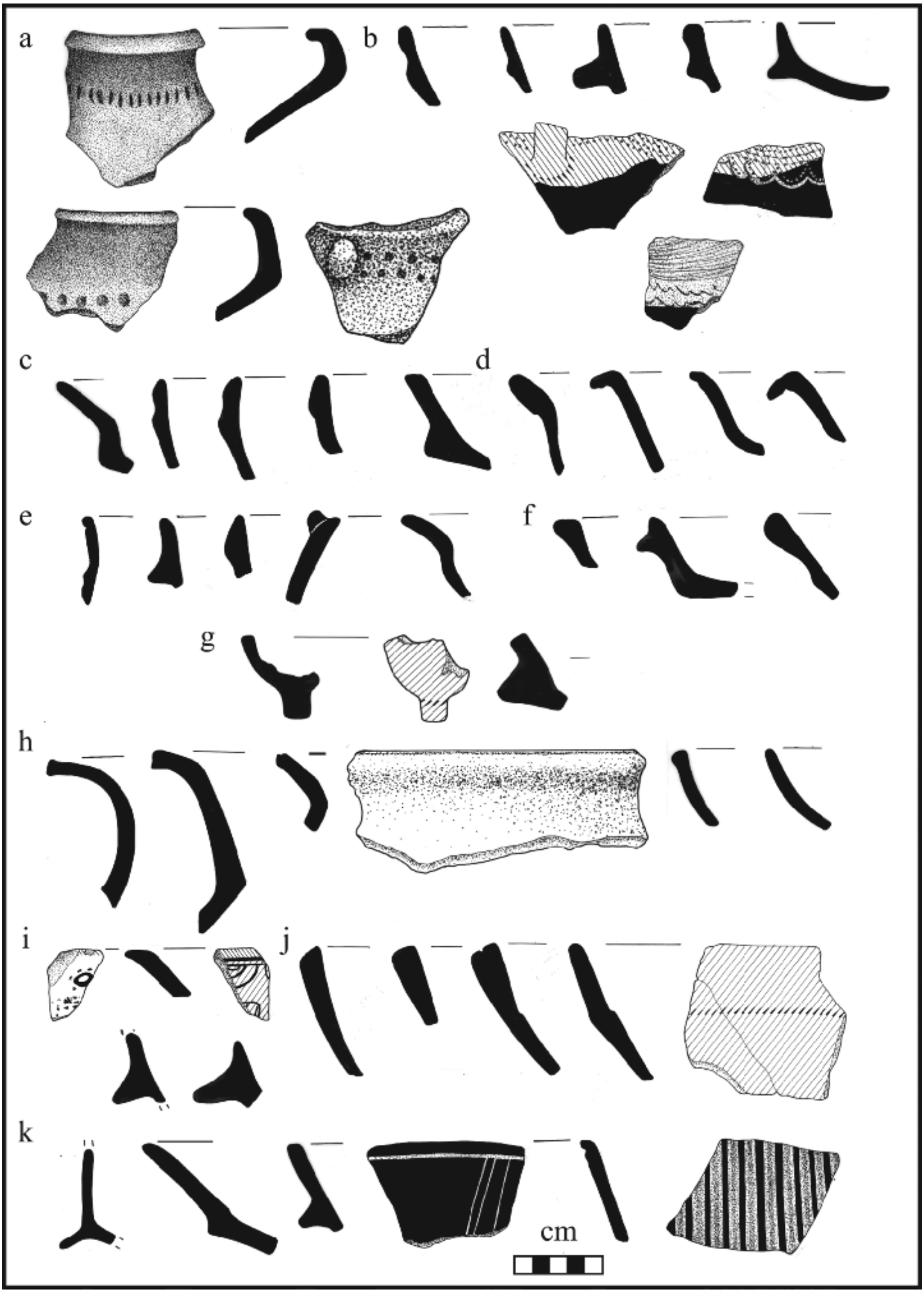

Figure 3.2. Major types and forms of the Potts and Burrell Ceramic Complexes: (a) Paila Unslipped Group; (b) Sierra Red Group, including Puletan Red-and-unslipped; (c) Cabro Red Group; (d) Hillbank Red Group; (e) Polvero Black Group; (f) Flor Cream Group; (g) Aguacate Orange Group; (h) Quintal Unslipped and Hewlett Bank Unslipped Groups; (i) Actuncan and Dos Arroyos Orange Polychrome Groups; (j) Aguila Orange Group; and (k) Balanza Black Group. (Illustrations by Carmen Ting.)

1993; Smith 1955) as well as Belize Valley types (Gifford 1976) and is present in mixed deposits in all site center excavations. These include the Minanha Red, Aguila Orange, Balanza Black, Pucte Brown, and the Actuncan and Dos Arroyos Orange Polychrome Ceramic Groups (table 3.3). Smith and Gifford (1966) initially identified at Uaxactun a monochrome red group, Dos Hermanos, which was also utilized at Barton Ramie (Gifford 1976). However, my own and others' observations on ceramics from northern Belize (Kosakowsky and Lohse 2003; Sagebiel 2005), as well as ceramic research in the Petén (Culbert 1993; Forsyth 1993), suggest that much of the monochrome orange Early Classic material tends toward red-orange in color, and in keeping with Forsyth's (1989) work I subsume the red-orange examples at Chan into a variety in the Aguila Group (Forsyth calls this Aguila Orange: Dos Hermanos Variety). The Chan material certainly seems to support prior assertions (Kosakowsky and Pring 1998; Kosakowsky and Sagebiel 1998) that red-slipped pottery continues with some prevalence in the Early Classic in Belize, though it is less common in Petén sites (Forsyth 1989, 1993).

Finally, there are examples of unslipped and striated ceramics that relate to both the Hewlett Bank Unslipped Group at Barton Ramie (Gifford 1976) and the Quintal Unslipped and Triunfo Striated Groups at Uaxactun (Smith and Gifford 1966). It is virtually impossible to distinguish between the unslipped types from Uaxactun and Barton Ramie, though Gifford (1976) assigned new type names for the Belize Valley examples. I have therefore decided to use the first named types identified by Smith and Gifford (1966) at Uaxactun.

Polychrome decoration begins in the Early Classic at Chan, and common vessel forms include basal flange bowls with ring bases, outcurving necked jars, often with grooved lips, and small open bowls. The low quantity of Burrell Complex ceramics (*N*=843) is more likely the result of the continuation of the use of Late Preclassic types well into the fourth and possibly fifth century AD, as has been documented elsewhere (Kosakowsky and Sagebiel 1998), as well as the fact that the soft surface finishes of many Early Classic sherds do not preserve well and result in low type counts, rather than representing a population decline. There are numerous eroded Early Classic vessel forms, including basal flange bowls and ring bases, in the Chan collections that could not be identified to type.

The Early Late Classic Jalacte Ceramic Complex (AD 600–670)

Distinguishing among the three ceramic complexes that generally constitute the Late Classic at Maya lowland sites often has proven problematical. The early Late Classic is a fairly short, 50–75-year, period at most sites (Smith 1955; Gifford 1976) that frequently is poorly represented and more easily differentiated from the later complexes on the basis of vessel form modal changes than typological ones (Culbert 1993; Thompson 1939, 1940). Additionally, it is during the Late Classic that the ceramics of the Belize Valley appear to diverge more greatly from those of Petén manufacture (Gifford 1976), and the quantity of Petén Gloss Wares in the Belize Valley declines markedly in some cases or there are discontinuities in the ceramic traditions in others (Ball and Taschek 2004).

The early Late Classic Jalacte Ceramic Complex (table 3.3) at Chan is represented by locally manufactured ceramics from the Pine Ridge Carbonate Ware including Mountain Pine Red, Dolphin Head Red, Mt. Maloney Black, and Saturday Creek Polychrome, as well as the Sotero Red-brown (Unspecified Ware), Chunhuitz Orange (Vinaceous Tawny Ware), and Belize Red (British Honduras Volcanic Ash Ware) Groups (figure 3.3). Gifford (1976) identified the latter two groups as ceramics from the late Late Classic at Barton Ramie; however, the analysis of the Chan material confirms their placement slightly earlier in time, as reported elsewhere (Ball and Taschek 2004; LeCount et al. 2002). There are also small quantities of Petén Gloss Wares, including Molino Black and Saxche Orange Polychrome. While there are large quantities of large bowls and jars of the Mt. Maloney Black Group (29.4%), a pattern identified at Xunantunich, as well as marking an upper Belize Valley identity (LeCount 1996), at Chan there are equally large total quantities of smaller serving bowls, dishes, and plates of the monochrome red groups Mountain Pine (17.6%) and Dolphin Head (16.4%).

There are unslipped and striated sherds, which pertain to either the Cayo or Zibal Unslipped and the Tu-Tu Camp or Jones Camp Striated Groups as identified by Gifford at Barton Ramie (1976), or the Cambio Unslipped and Encanto Striated Groups from Uaxactun (Smith and Gifford 1966). In the absence of strong vessel form differences among all Late Classic unslipped jars, and in order to reflect the increasing divergence in ceramic types between the Belize Valley and Late Classic Petén sites, I have chosen in this case to generalize and to utilize the Barton Ramie Ceramic Groups, Cayo and Tu-Tu Camp, for all Late Classic unslipped jars at Chan. Characteristic

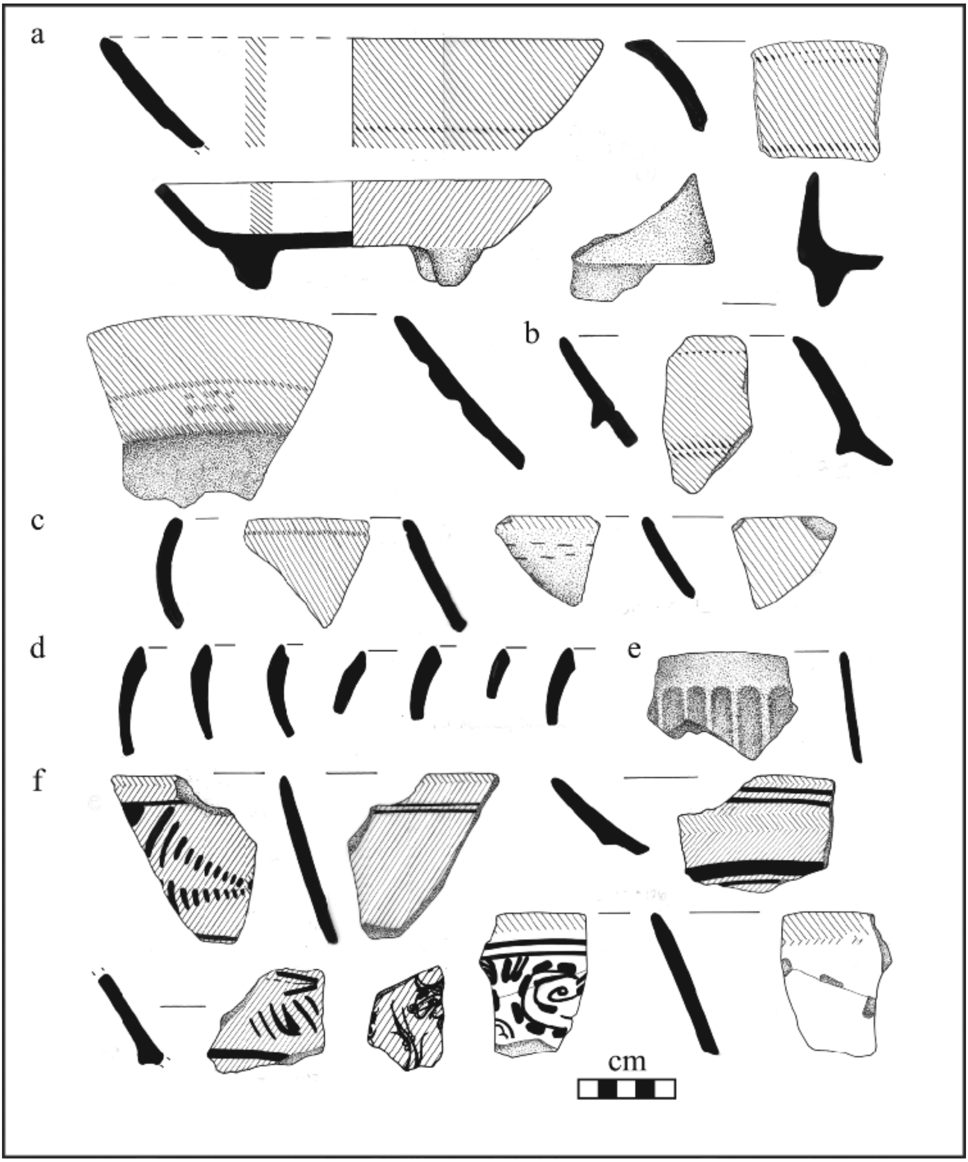

Figure 3.3. Major types and forms of the Jalacte Ceramic Complex: (a) Belize Red Group; (b) Mountain Pine Red Group; (c) Dolphin Head Red Group; (d) Mt. Maloney Black Group; (e) Sotero Red-brown Group (slip not shown); and (f) Saxche Orange Polychrome Group. (Illustrations by Carmen Ting.)

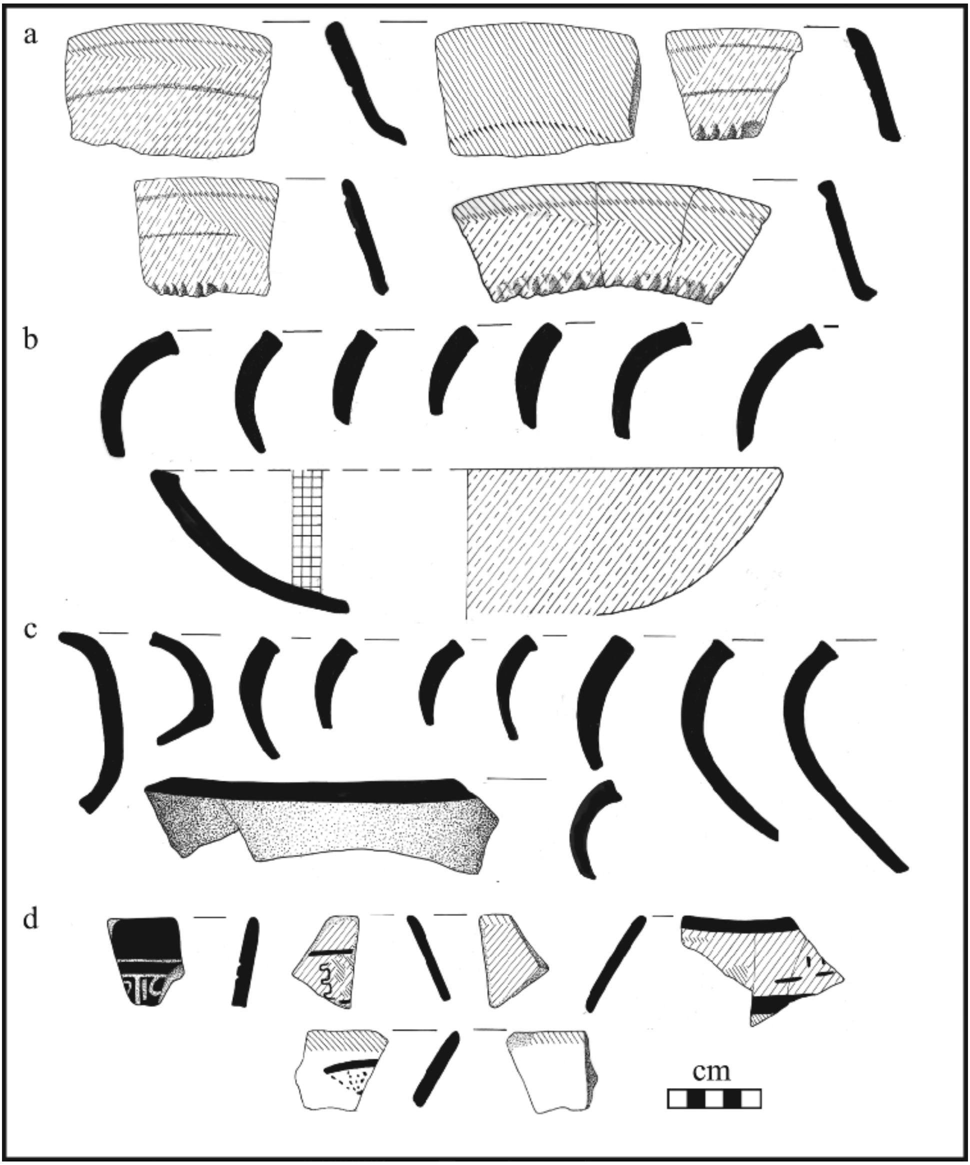

Figure 3.4. Major types and forms of the Pesoro Ceramic Complex: (a) Dolphin Head Red Group; (b) Garbutt Creek Red Group, including Rubber Camp Brown; (c) Mt. Maloney Black Group; and (d) Petén Gloss Wares, including the Achote Black Group and Saxche/Palmar polychromes. (Illustrations by Carmen Ting.)

vessel forms for the entire Jalacte Complex include medially ridged flaring-sided plates, large and small open rounded-sided bowls, large basins, and large outcurving necked jars with bolstered rims.

The Late Late Classic Pesoro Ceramic Complex (AD 670–800/830)

Many of the types from the early Late Classic continue in use into the late Late Classic and Terminal Classic but with changes in vessel form, rim and lip treatments, and frequency. This approach has been utilized to successfully differentiate among the three Late Classic complexes at the large nearby center of Xunantunich (LeCount 1996; LeCount et al. 2002) and at the site and region around Buenavista (Taschek and Ball 2003). The late Late Classic Pesoro Ceramic Complex at Chan (table 3.3) includes the continuation of the Dolphin Head, Mt. Maloney (figure 3.4), Chunhuitz, and Belize Ceramic Groups (figure 3.5), with the addition of two monochrome red groups, Garbutt Creek (including Rubber Camp Brown), and Vaca Falls in the Pine Ridge Carbonate Ware. Sherds in the Belize Red Group exhibit greater elaboration in decoration involving incising and impressing. There are only minor quantities of Petén Gloss Wares, including Tinaja Red, Achote Black, and Saxche/Palmar Orange Polychrome. The unslipped and striated forms become massive in size (figure 3.6) as the Late Classic continues, and appliquéd and modeled censers make their appearance.

While monochrome black large bowls and jars of the Mt. Maloney Group continue to constitute the greatest percentage (31.1%) of the complex, smaller monochrome red serving bowls, dishes, and plates of the Dolphin Head (24.1%), Vaca Falls (1.1%), and Garbutt Creek (2.0%) Groups are used in almost similar total frequencies in the Chan site core. Fine serving vessels of the Belize Red and Chunhuitz Orange Groups also constitute approximately 10 percent of the complex, although counts of these two groups are somewhat compromised because they possess an extremely soft paste that erodes easily. It is equally true that rim counts of the Mt. Maloney Group may be slightly elevated due to their durable nature and ease of identification based on form, even when surface finishes are eroded. The relatively large quantities of monochrome red vessels at Chan is in contrast to the pattern identified at Xunantunich, where Mt. Maloney comprises 37 percent of the late Late Classic and the monochrome reds of the Dolphin Head, Vaca Falls, and Garbutt Creek Groups constitute less than 5 percent (LeCount 1996).

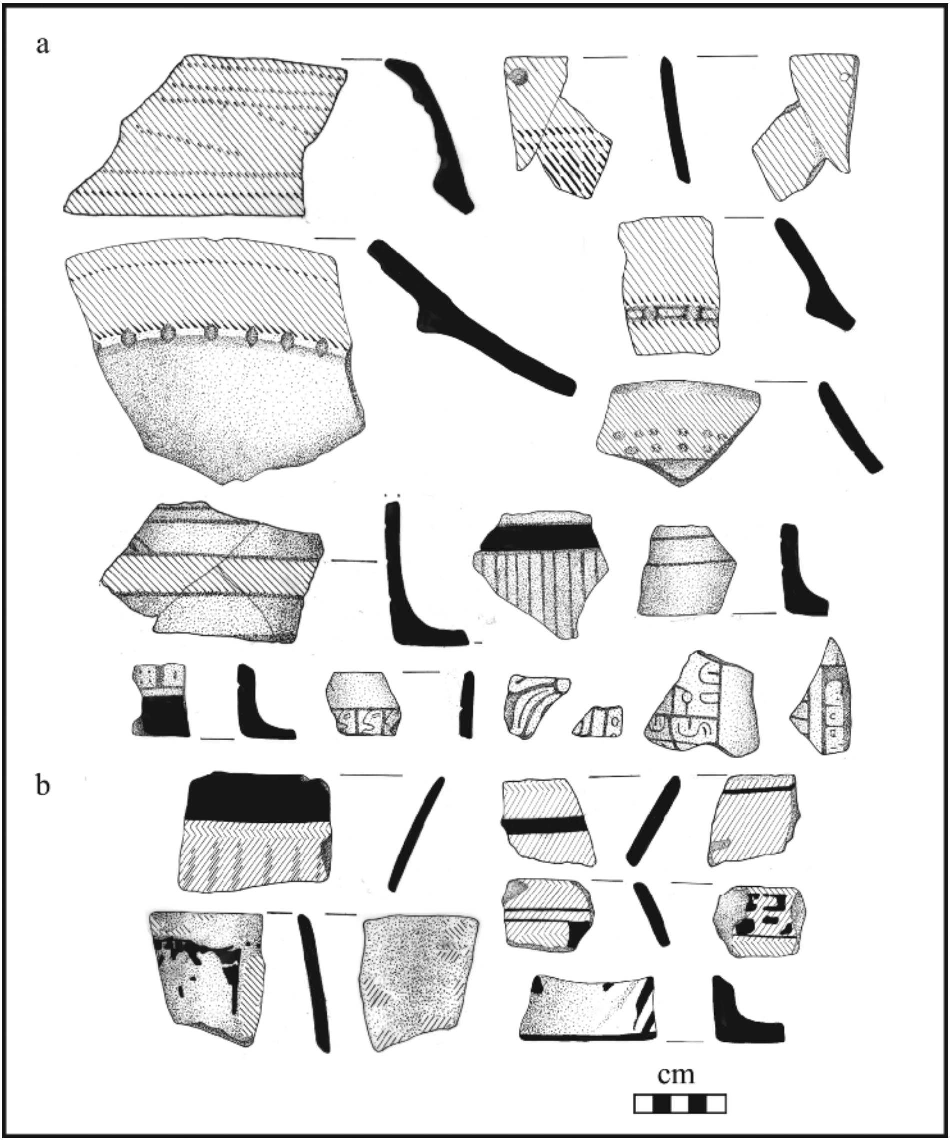

Figure 3.5. Major types and forms of the Pesoro and Vieras Ceramic Complexes: (a) Belize Ceramic Group; and (b) Chunhuitz Ceramic Group, including Benque Viejo polychrome. (Illustrations by Carmen Ting.)

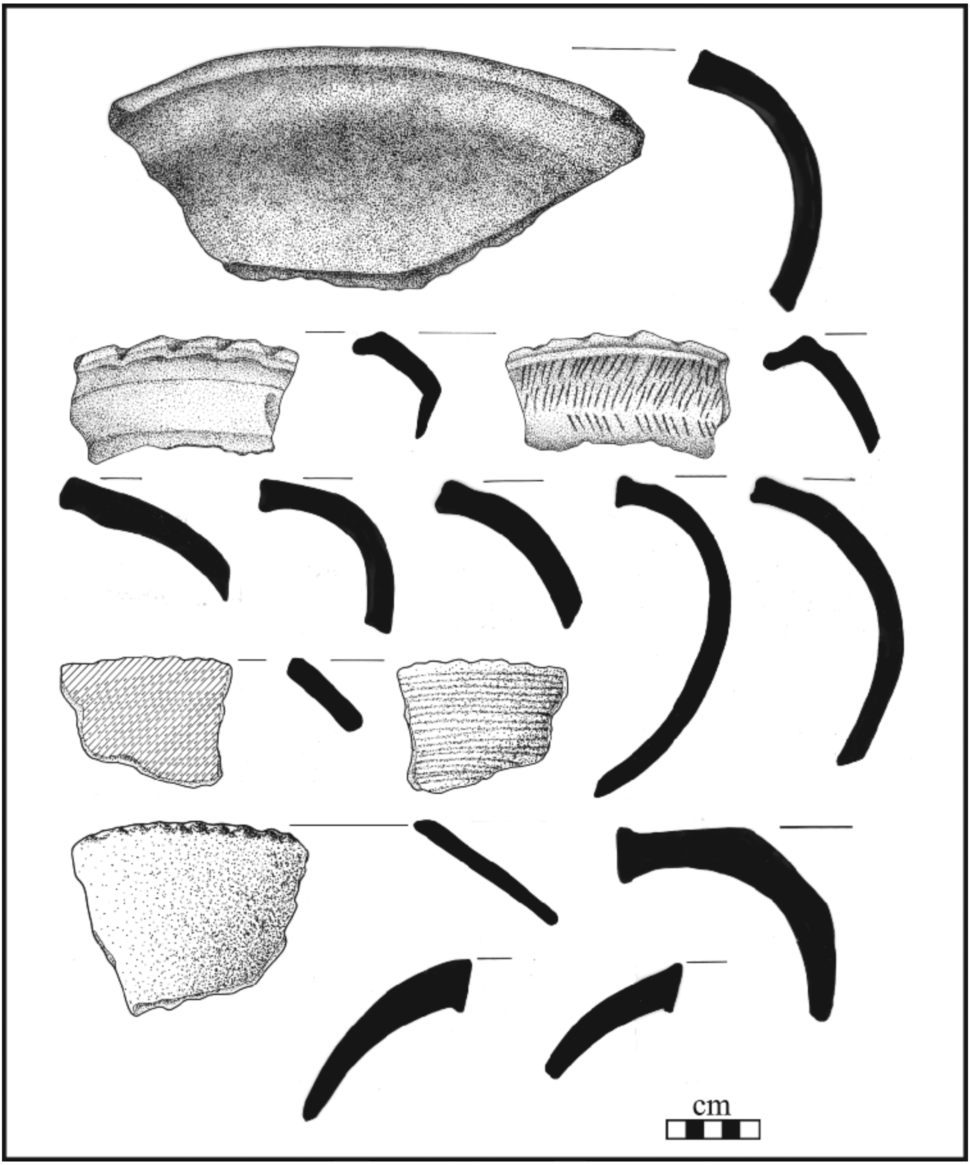

Figure 3.6. Tu-Tu Camp Striated and Cayo Unslipped jars and basins from the Pesoro and Vieras Ceramic Complexes. (Illustrations by Carmen Ting.)

The Terminal Classic Vieras Ceramic Complex (AD 800/830–900)

The identification of the Terminal Classic Vieras Ceramic Complex (table 3.3) at Chan is once again based largely upon vessel form changes and frequency of ceramic types, including the introduction of spiked censers. Preliminary analysis confirms a continuation of the trends first seen in the preceding Pesoro Ceramic Complex, and a decline in the frequency of polychrome decoration of any kind, as well as the absence of Petén Gloss Wares. Terminal occupation deposits on virtually all of Chan's site center structures suggest that these buildings experienced their final modifications during this time period. The ceramics, as well as a series of radiocarbon dates (see table 3.2) from terminal deposits and caches from the east structure of the E-Group (Structure 5) and the south structure (Structure 6), suggest a ninth-century date for these final events.

Finally, there is evidence of sparse Early Postclassic occupation in both the settlement area and the site center of Chan, including some incomplete Augustine Red dishes with scroll feet, unslipped jar rims similar to Early Postclassic examples from Barton Ramie (Gifford 1976), and Miseria Appliquéd incensario fragments that continue into use in the Early Postclassic (Sabloff 1975), though there are insufficient quantities of ceramics to identify a complete ceramic complex. A number of caches were placed in the Central Plaza during the Early Postclassic (described in chapter 15), and ceramics from this period are found also in the West Plaza and in the topmost humus levels of the south structure (Structure 6) and north structure (Structure 2) in the Central Group, suggesting activity that was largely ephemeral and perhaps ritual in nature, with incensarios placed on buildings that had already fallen into disrepair. A single residential structure in the settlement area yielded surface ceramics from the Early Postclassic.

Conclusion

The Chan ceramic analysis, utilizing type: variety-mode classifications and complementary radiocarbon dating, successfully elucidates the chronological placement of construction sequences in the site center and the settlement survey area and provides a better understanding of the site's long culture history as it relates to the Belize Valley and the Maya lowlands. As described in chapter 2, the ceramics from the settlement survey area indicate continuing population growth from the Middle Preclassic through the

Early Classic, with a dramatic increase beginning in the Late Classic. The major construction of Chan's site center buildings began in the Late Preclassic and ceased in the Terminal Classic (see chapters 6 and 7).

Chan indeed offers a unique set of ceramic data with which to examine a level of prehistoric Maya society that is all too often ignored. Chan is an agrarian community and possesses an E-Group (Aimers and Rice 2006; Aveni and Hartung 1989; Ricketson and Ricketson 1937). The site core sequence, including the Central Group, provides a deep chronological history of the site and, as discussed in other chapters of this volume, allows us to address questions about the nature of Chan's founding family, the role of ritual at this level of Maya sociopolitical organization, and the role of Chan's leaders in wider networks linking Chan to sites throughout the Belize Valley and the Maya lowlands beginning as early as the Preclassic.

Though the Chan ceramic sequence to some extent mirrors other site sequences from the Belize Valley, it is important to remember that it is in highlighting not only the ceramic similarities but also the differences that provides the potential to inform on those wider intersite and interregional networks. The geographic dispersion of shared stylistic ceramic traits can link (or exclude sites) in higher-order ceramic spheres that share a high degree of content similarity in ceramic types (Willey, Culbert, and Adams 1967). This shared content may be the result of shared values of style and information or the direct result of production and exchange, and thus it may reflect either shared practices or shared products or both (Ball 1993). In either case, the shared content suggests regular contact between sites and regions, and the boundaries of ceramic spheres that shift through time reflect shifting relationships in turn. For example, the Middle Preclassic Boden ceramics at Chan appear similar to those found at other Belize Valley sites. The Boden Complex is largely composed of local ceramics, though small quantities of Flores Waxy Ware sherds are similar to types in northern Belize, the Yucatan, and the Petén (Adams 1971; Ball 1977; Ball and Taschek 2003; Culbert 1993; Kosakowsky 1987; Smith and Gifford 1966) and suggests that the inhabitants of Chan were engaged with residents of other Maya sites by Middle Preclassic Mamom Sphere times.

By the Late Preclassic, shared stylistic traits of the Chicanel Ceramic Sphere are present at Chan and at virtually every other site in the Maya lowlands. This trend in ceramic manufacture toward greater sharing of a ceramic inventory is demonstrated by the large quantities of Sierra Red Group pottery at all Maya sites and also the presence of similar minor ceramic types and varieties across vast distances. The standardization of vessel forms and finishes co-occurs with the development of local settlement hierarchies, the first major large-scale public construction of buildings, and no doubt concomitant social and economic interdependence on an intra- and intersite and even interregional level.

There are only small samples of Terminal Preclassic Potts pottery at Chan, which does little to resolve some of the conflicting definitions of types and chronological associations from this time period (Pring 2000). The Potts ceramic types from Chan are similar to types from the Floral Park Sphere identified first at nearby Barton Ramie in the Belize Valley (Gifford 1976), as well as from northern Belize (Kosakowsky and Lohse 2003; Meskill 1992; Robertson-Freidel 1980; Valdez and Houk 2000) and the Petén (Culbert 1993; Callaghan 2008), so while there is some regionalization, the residents of Chan appear to have continued their participation in wider lowland Maya spheres of interaction. Similarly, the Early Classic Burrell pottery at Chan demonstrates this ongoing pattern, with ceramics that pertain largely to Belize Valley sites (Gifford 1976) and smaller quantities suggesting participation in the Petén Tzakol Sphere of influence (Smith and Gifford 1966).

The Late Classic marks a divergence of the Chan ceramics, and those of other Belize Valley sites, from the Petén-centered Tepeu Ceramic Sphere. Previous research in the area has focused on the growth of the site of Xunantunich and its late intrusion into the regional settlement in the Late Classic (Leventhal and Ashmore 2004) as the prime focus for all sites, small and large. Though there is clearly a Belize Valley ceramic identity, with most sites sharing a similar repertoire of pottery types, including Chan, there remains a very small presence of Petén pottery. While numerous sites in the Belize Valley, much larger than Chan, vied for power throughout the Preclassic and Early Classic periods, it is only during the Late Classic that the region was unified, with some degree of political integration, under the short-lived control of Xunantunich (Leventhal and Ashmore 2004). Ceramic data suggest that Chan had sustained contact with its neighbors across its 2,000-year history, and yet, as reflected in the ceramic sequence, the rural residents of Chan appear to have engaged in activities of daily subsistence and community ritual that were little affected and uninterrupted by the rise and fall of larger polities.

Note

1. The Chan ceramic collections come from six kinds of locations: (1) specialized contexts such as burials and caches that represent a single event and hence are chronologically "clean," as well as one *chultun*; (2) primary middens that are chronologically unmixed; (3) relatively chronologically pure, single-component on-floor terminal occupation deposits; (4) redeposited middens incorporated rapidly as fill material with only some degree of chronological mixing; (5) structural fill, often chronologically mixed; and (6) mixed collections from the surface clearing of structures and plaza areas, as well as looters' trenches. As is typical of the formation processes that contribute to Maya archaeological sites, the prehistoric inhabitants rarely left midden material in its primary location but recycled it as fill. Therefore, the majority of the Chan sample is from architectural fills that are chronologically mixed to some degree.

Table 3.3. Ceramic types of all Chan ceramic complexes

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
Boden (*N*=8,047)	Uaxactun Unslipped	Jocote (38.4%)	Jocote Orange-brown: Jocote Variety	2,178 (R=351)
			Palma Daub: Palma Variety	18 (R=2)
		Sayab (2.2%)	Cooma Striated: Cooma Variety	38 (R=20)
	Flores Waxy	Joventud (4.2%)	Joventud Red: Unspecified Variety	238 (R=30)
			Guitara Incised: Grooved Incised Variety	21 (R=9)
		Pital (2%)	Pital Cream: Unspecified Variety	51 (R=18)
		Muxanal (<1%)	Muxanal Red-on-cream: Unspecified Variety	15 (R=2)
		Chunhinta (1%)	Chunhinta Black: Unspecified Variety	67 (R=6)
			Deprecio Incised: Unspecified Variety	3 (R=2)
	Mars Orange	Savana (52.1%)	Savana Orange: Rejolla Variety	5,031 (R=369)
			Reforma Incised: Unspecified Variety	387 (R=110)

(continued)

Table 3.3—*Continued*

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
Cadle (*N*=5,102)	Uaxactun Unslipped	Paila (14.4%)	Paila Unslipped: Unspecified Variety	185(R=121)
		Sapote (<1%)	Sapote Striated: Sapote Variety	61 (R=4)
	Paso Caballo Waxy	Sierra (70.4%)	Sierra Red: Sierra Variety	3,933 (R=510)
			Laguna Verde Incised: Grooved Incised Variety	106 (R=71)
			Lagartos Punctated: Unspecified Variety	6 (R=1)
			Puletan Red-and-unslipped: Unspecified Variety	7 (R=2)
			Society Hall Red: Society Hall Variety	40 (R=9)
		Matamore (1%)	Matamore Dichrome: Unspecified Variety	40 (R=8)
		Flor (3.1%)	Flor Cream: Unspecified Variety	147 (R=26)
		Polvero (9%)	Polvero Black: Unspecified Variety	499 (R=69)
			Lechugal Incised: Unspecified Variety	22 (R=7)
	Gale Creek Red	Hillbank (1.7%)	Hillbank Red: Hillbank Variety	56 (R=14)
Potts (*N*=2,291)	Uaxactun Unslipped	Paila (22.4%)	Paila Unslipped: unspecified Variety	251 (R=117)
		Monkey Falls (<1%)	Monkey Falls Striated: Unspecified Variety	145 (R=2)
		Quintal (0%)	Candelario Appliquéd: Unspecified Variety	10 (R=0)
	Paso Caballo Waxy	Sierra (56.1%)	Sierra Red: Sierra Variety	1,105 (R=266)
			Laguna Verde Incised: Grooved Incised Variety	5 (R=3)
			Lagartos Punctated: Unspecified Variety	10 (R=1)
			Puletan Red-and-unslipped: Unspecified Variety	19 (R=6)

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
			Society Hall Red: Society Hall Variety	40 (R=17)
		Cabro (4.2%)	Cabro Red: Unspecified Variety (same as Sierra Red: Big Pond Variety)	30 (R=22)
		Matamore (<1%)	Matamore Dichrome: Unspecified Variety	7 (R=2)
		Flor (1.3%)	Flor Cream: Unspecified Variety	52 (R=7)
		Polvero (5.0%)	Polvero Black: Unspecified Variety	268 (R-23)
			Lechugal Incised: Unspecified Variety	4 (R=3)
		San Felipe (2.3%)	San Felipe Brown: San Felipe Variety	45 (R=7)
			San Antonio Golden Brown: San Antonio Variety	42 (R=5)
		Escobal (<1%)	Escobal Red-on-buff: Unspecified Variety	10 (R=1)
		Sarteneja (0%)	Sarteneja Usulután: Unspecified Variety	4 (R=0)
	Gale Creek Red	Hillbank (4.8%)	Hillbank Red: Hillbank Variety	177 (R=25)
	Holmul Orange	Aguacate (2.9%)	Aguacate Orange: Aguacate Variety	67 (R=15)
Burrell (*N*=843)	Uaxactun Unslipped	Quintal (17.1%)	Quintal Unslipped: Unspecified Variety	84 (R=51)
			Candelario Appliquéd: Unspecified Variety	8 (R=0)
		Triunfo (4.3%)	Triunfo Striated: Unspecified Variety (includes Mopan/Soccotz/White Cliff Striated, named by Gifford [1976])	46 (R=13)
	Unspecified	Hewlett Bank (8.4%)	Hewlett Bank Unslipped: Hewlett Bank Variety	25 (R=25)

(continued)

Table 3.3—*Continued*

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
	Petén Gloss	Minanha (4.0%)	Minanha Red: Minanha Variety	103 (R=12)
		Aguila (55.5%)	Aguila Orange: Aguila Variety	154 (R=74)
			Aguila Orange: Dos Hermanos Variety	225 (R=86)
			Pita Incised: Unspecified Variety	23 (R=6)
		Balanza (3.3%)	Balanza Black: Unspecified Variety	94 (R=9)
			Lucha Incised: Unspecified Variety	8 (R=1)
			Paradero Fluted: Unspecified Variety	3 (R=0)
		Pucte (4.3%)	Pucte Brown: Unspecified Variety	29 (R=12)
			Santa Teresa Incised: Unspecified Variety	4 (R=1)
		Actuncan (<1%)	Boleto Black-on-orange: Unspecified Variety	4 (R=2)
		Dos Arroyos (2.3%)	Dos Arroyos Orange Polychrome: Dos Arroyos Variety	31 (R=7)
			Juleki Cream Polychrome: Unspecified Variety	2 (R=0)
Jalacte (*N*=1,623)	Uaxactun Unslipped	Cayo (16.7%)	Cayo Unslipped: Unspecified Variety	145 (R=58)
		Tu-Tu Camp (1.4%)	Tu-Tu Camp Striated: Unspecified Variety	9 (R=5)
	Pine Ridge Carbonate	Mountain Pine (17.6%)	Mountain Pine Red: Mountain Pine Variety	275 (R=61)
		Dolphin Head (16.4%)	Dolphin Head Red: Dolphin Head Variety	290 (R=55)
			Silver Creek Impressed: Silver Creek Variety	4 (R=2)
		Mt. Maloney (29.4%)	Mt. Maloney Black: Unspecified Variety	419 (R=102)

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
		Saturday Creek (1.2%)	Saturday Creek Polychrome	4 (R=4)
	Unspecified	Sotero (2.3%)	Sotero Red-brown: Sotero Variety	16 (R=8)
			Silkgrass Fluted: Silkgrass Variety	8 (R=1)
	Petén Gloss	Molino (4.9%)	Molino Black: Unspecified Variety	91 (R=17)
		Saxche (2.9%)	Saxche Orange Polychrome	27 (R=10)
			Juleki Cream Polychrome: Unspecified Variety	2 (R=0)
	British Honduras Volcanic Ash	Belize (6.1%)	Belize Red: Belize Variety	292 (R=18)
			Platon Punctated-incised: Platon Variety	3 (R=1)
			Martins Incised: Martins Variety	3 (R=2)
			Gallinero Fluted: Gallinero Variety	1 (R=0)
	Vinaceous Tawny	Chunhuitz (1.0%)	Chunhuitz Orange: Unspecified Variety	26 (R=0)
			Benque Viejo Polychrome: Unspecified Variety	8 (R=3)
Pesoro (*N*=12,156)	Uaxactun Unslipped	Cayo (28.6%)	Cayo Unslipped: Unspecified Variety	2,159 (R=786)
		Tu-Tu Camp (<1%)	Tu-Tu Camp Striated: Unspecified Variety	36 (R=22)
		Cambio	Pedregal Modeled: Unspecified Variety	16 (R=0)
	Pine Ridge Carbonate	Dolphin Head (24.1%)	Dolphin Head Red: Dolphin Head Variety	2,460 (R=529)
			Silver Creek Impressed: Silver Creek Variety	206 (R=134)
		Vaca Falls (1.1%)	Kaway Impressed: Kaway Variety	1 (R=0)

(continued)

Table 3.3—*Continued*

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
			Vaca Falls/Roaring Creek Red: Unspecified Varieties	279 (R=31)
		Garbutt Creek (2.0%)	Garbutt Creek Red: Garbutt Creek Variety	55 (R=54)
			Rubber Camp Brown: Rubber Camp Variety	5 (R=1)
		Mt. Maloney (31.1%)	Mt. Maloney Black: Unspecified Variety	3,151 (R=857)
	Unspecified	Macal	Macal Orange-red: Macal Variety	54 (R=0)
	Petén Gloss	Achote (<1%)	Achote Black: Unspecified Variety	45 (R=9)
			Cubeta Incised: Unspecified Variety	3 (R=0)
		Tinaja (<1%)	Tinaja Red: Unspecified Variety	20 (R=8)
		Saxche/Palmar (<1%)	Saxche/Palmar Orange Polychrome: Unspecified Varieties	40 (R=15)
			Juleki/Zacatel Cream Polychrome: Unspecified Varieties	5 (R=1)
	British Honduras Volcanic Ash	Belize (9.2%)	Belize Red: Belize Variety	3,345 (R=202)
			Platon Punctated-incised: Platon Variety	53 (R=26)
			Martins Incised: Martins Variety	49 (R=22)
			Gallinero Fluted: Gallinero Variety	11 (R=2)
			McRae Impressed: McRae Variety	1 (R=0)
			Big Falls Gouged Incised: Unspecified Variety	4 (R=1)
			Other Belize Group: Unnamed Composite Variety	1 (R=1)
	Vinaceous Tawny	Chunhuitz (1.9%)	Chunhuitz Orange: Unspecified Variety	54 (R=6)

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
			Benque Viejo Polychrome: Unspecified Variety	101 (R=44)
			Xunantunich Black-on-orange: Unspecified Variety	2 (R=2)
Vieras (*N*=8,980)	Uaxactun Unslipped	Cayo (28.5%)	Cayo Unslipped: Unspecified Variety	1,635 (R=552)
			Alexanders Unslipped: Unspecified Variety	50 (R=49)
		Tu-Tu Camp (<1%)	Tu-Tu Camp Striated: Unspecified Variety	32 (R=16)
		Cambio (<1%)	Pedregal Modeled: Unspecified Variety	342 (R=1)
			Miseria Appliquéd: Unspecified Variety	4 (R=0)
	Pine Ridge Carbonate	Dolphin Head (20.0%)	Dolphin Head Red: Dolphin Head Variety	1,093 (R=383)
			Silver Creek Impressed: Silver Creek Variety	52 (R=39)
		Vaca Falls (4.6%)	Kaway Impressed: Kaway Variety	6 (R=1)
			Vaca Falls/Roaring Creek Red: Unspecified Varieties	265 (R=97)
		Garbutt Creek (<1%)	Garbutt Creek Red: Garbutt Creek Variety	14 (R=14)
			Rubber Camp Brown: Rubber Camp Variety	8 (R=3)
		Mt. Maloney (30.8%)	Mt. Maloney Black: Unspecified Variety	1,993 (R=650)
	Unspecified	Yaha Creek (<1%)	Yaha Creek Cream: Yaha Creek Variety	11 (R=1)
	British Honduras Volcanic Ash	Belize (12.3%)	Belize Red: Belize Variety	3,089 (R=230)
			Platon Punctated-incised: Platon Variety	24 (R=5)
			Martins Incised: Martins Variety	30 (R=15)

(continued)

Table 3.3—*Continued*

Complex	Ware	Group (frequency)	Type: Variety	Total count diagnostics (rims)
			Gallinero Fluted: Gallinero Variety	2 (R=0)
			McRae Impressed: McRae Variety	1 (R=1)
			Big Falls Gouged Incised: Unspecified Variety	2 (R=0)
			Other Belize Group: Unnamed Composite Variety	9 (R=8)
	Vinaceous Tawny	Chunhuitz (2.2%)	Chunhuitz Orange: Unspecified Variety	195 (R=20)
			Benque Viejo Polychrome: Unspecified Variety	119 (R=27)
			Xunantunich Black-on-orange: Unspecified Variety	4 (R=0)

4

Agricultural Practices at Chan

Farming and Political Economy in an Ancient Maya Community

ANDREW R. WYATT

The mosaic of ecological zones in the Maya area supported a variety of agricultural technologies that were spatially and temporally unique (Fedick 1996b; Graham 1987). Agricultural practices among the ancient Maya ranged from relatively large-scale wetland modifications, such as the creation of raised fields in low-lying swampy areas and along rivers, and the cultivation of *bajos* and bajo margins; extensively terraced hillsides; milpas and orchards; and small-scale gardens near households (Adams 1982; Dunning and Beach 1994; Fedick 1994; Harrison 1978; Healy et al. 1983; Matheny 1978; Pohl 1990; Siemens and Puleston 1972; Turner 1983; Turner and Harrison 1983). In many areas they often utilized several of these technologies at once, capitalizing on different ecological zones present in a comparatively limited area (Kunen 2004). This diversity contrasts with early hydraulic civilizations that were dependent upon large-scale irrigation systems for the majority of their agricultural production (Adams 2006; Butzer 1976; Oates and Oates 1976; Wittfogel 1957) and suggests a different relationship between agricultural producers and the political economy.

These techniques represent what are commonly defined as intensive agriculture. Agricultural intensification is the process of deriving greater production from the same amount of land or maintaining production levels in the face of ecological degradation. This is accomplished through increases in labor and skills, through the creation of agro-engineering features, or through a combination of the two. Brookfield (1972: 32) defines intensification quite succinctly when he writes that "in regard to land, or to any natural resource complex, intensification must be measured by inputs only of capital, labor, and skills against constant land. The primary purpose of intensification is the substitution of these inputs for land, so as to gain more production from a given area, use it more frequently, and hence make possible a greater concentration of production." In the Maya area, agricultural intensification is most often confirmed by the presence of large-scale agro-engineering features, such as raised fields, modified wetlands, and terrace walls.

It is agricultural terracing, the most visually evident and numerous evidence of agricultural intensification in the Maya area, that I focus on in this chapter. In particular, I discuss the chronological development of terrace agriculture, the pattern of terraces and mounds on the landscape, the water control features encountered on the terraces, and the artifacts recovered on the terrace beds. Extensive excavations recovered an unprecedented level of data, permitting the development of a model of the history of terrace agriculture at Chan, demonstrating how the terraces were cultivated, and reconstructing the relationship of Chan farmers to nearby sites. These data show that terraces predate the rise of the nearby polity capital of Xunantunich and that the construction of the terraces and the cultivation on the terrace beds demonstrate household-level control, rather than centralized management by distant elites.

Terrace Agriculture in the Maya Lowlands

Although the Maya lowlands are comparatively flat, there are extensive areas of undulating terrain and even relatively steep hillsides suitable for agricultural terracing. Thousands of hectares in the Rio Bec region (Turner 1983), the Maya Mountains (Murtha 2009), the Petexbatún (Beach and Dunning 1995; Dunning and Beach 1994), the Belize River valley (Fedick 1994), the Vaca Plateau (A. Chase and D. Chase 1998; Healy et al. 1983; Pollock 2007), the Three Rivers region (Hageman and Lohse 2003; Kunen 2004; Lohse 2004), and the Maya highlands (Guzman 1958; Mathewson 1984) have been transformed through the adoption of agricultural terraces. Of all the different techniques for intensifying agriculture, the construction of agricultural terraces appears to predominate throughout the Maya area.

Many researchers have suggested that terraces were constructed in the Late Classic in order to meet the rising demands of tribute as well as a burgeoning population (Dunning, Beach, and Rue 1997; Leventhal and Ashmore 2004; Turner 1978). In their discussion of the origins of complex Maya political systems, Adams and Culbert (1977: 6) state that "the specific defining features of Lowland Maya Civilization are . . . the achievement of high-density, permanent rural populations at least in the Late Classic . . . by means of labor-intensive farming. . . . Management of these techniques and of the population was a function of the elite class." In the Rio Bec region, where hundreds of acres of terraced hillsides are found, Turner (1983: 118) states that "the implementation of terracing, raised fields, and field demarcation was emblematic of increasing pressures to produce agricultural foods during the Classic Period." These examples illustrate a consensus among researchers that agricultural intensification, particularly the construction of agricultural terraces throughout the Maya area, occurred as a response to the Late Classic population explosion and represents the control and appropriation of production by elites.

The preceding assumption is founded upon Ester Boserup's tour de force *The Conditions of Agricultural Growth* (1965), which correlates agricultural intensification with increasing population. Population, she asserts, is the prime mover that instigates the process of intensification (1965: 11); as populations rise, pressures on resources increase and populations respond by intensifying agricultural production to meet the rising demand for food. Fundamental to this model is the *law of least effort*: farmers will not expend any more energy on subsistence than they are required to do, adding more labor only as required by external factors, whether they be cultural, political, or ecological. According to Boserup, farmers will adopt intensive agricultural practices and technologies only under duress, because of the "hard toil" of intensive agriculture (1965: 51–53). In the case of the Maya, those who have applied Boserup's model suggest that the shortage of available land created by rising populations produced the conditions for the adoption of intensive methods.

A corollary of the population pressure hypothesis is the suggestion that terrace agriculture required centralized construction and management (A. Chase and D. Chase 1998; Neff 2010; Turner 1983). Chase and Chase (1998: 73) argue that the terraces surrounding the site of Caracol must have involved "some level of administrative control or, minimally, intervention" because of the large scale of the construction, the integration of the terraces with settlement and the causeways, and the data suggesting that construction of the terraces was coeval with settlement. In the Rio Bec region, Turner also proposes that "elites either controlled land or production on it, such that they could extract support from the farmers of that land" (Turner 1983: 120). Recently, Neff (2010) has argued that Xunantunich elites centralized production and exploited agricultural producers in the Xunantunich hinterlands.

However, defining a particular technology as "intensive" should not prompt us to paint all similarly defined agricultural systems with the same brush; the construction and organization of terrace agriculture is often quite different from that of the centralized irrigation systems that were the basis of early hydraulic civilizations (Adams 2006; Butzer 1976; Oates and Oates 1976; Wittfogel 1957). Terraces are unique in the realm of agricultural practices, as they are major investments in landesque capital yet are generally constructed and managed at the household or local level (Liao et al. 1989; Magcale-Macandog and Ocampo 2005; Netting 1968, 1974). Developmentally, terraced landscapes are often not constructed all at once but are the result of years and generations of continual effort (Donkin 1979; Hurni 1989; Liao et al. 1989; Mountjoy and Gliessman 1988). In his study of aboriginal terrace systems in the New World, Donkin writes that terraces were "undoubtedly constructed piecemeal by single families or small groups of families, and, unlike irrigation, their maintenance involved cooperation at a level no higher than that of the village community" (Donkin 1979: 33). Although reconstructions of ancient terrace systems often impose a centralized model on past societies, the ethnographic evidence suggests overwhelmingly otherwise.

Fundamental to a discussion of the development and control of terraces is the accurate dating of their construction. The chronology of terraces throughout the Maya lowlands so far has provided dates predominantly in the Late Classic, although there are suggestions that they may have been constructed earlier. Work at sites with large-scale agricultural terracing, such as Rio Bec (Turner 1983) and Caracol (A. Chase and D. Chase 1998; Healy et al. 1983), have demonstrated that many of the terraces at these sites were constructed in the Late Classic. Certain structures in the Rio Bec region have earlier dates (Turner 1983), and Murtha has determined that terraces in the Vaca Plateau were likely constructed in the Late Preclassic to Early Classic, based on the number and extent of terraces, population estimates, and labor inputs (Murtha 2002). It is also worth noting that the raised fields at Pulltrouser Swamp predate the Late Classic rise in population as well (Turner and Harrison 1983). But presently, early dates for terrace construction are equivocal or not based on actual material evidence, and therefore they carry less weight than definitive Late Classic dates based on artifactual evidence and the association of terraces with nearby structures.

This Late Classic bias has led many researchers to assume, prior to excavation and investigation of terrace features, that the terraces were built as a response to rising population levels and the need to increase production (Hageman and Lohse 2003). The expansion of elite power during the Late Classic certainly appropriated much of the agricultural production of farmers during this time, and a logical conclusion to draw from this is that the expansion of agricultural terracing during the Late Classic was tied to the appropriation of agricultural resources by the growing elite culture of the Lowland Maya. But at Chan, our excavations reveal a long chronology of terrace construction dated through direct artifactual evidence beginning in the Middle Preclassic and continuing through the history of the community. This demonstrates that accepted models of terrace construction and the adoption of intensive technologies in the Maya lowlands needs to be revised.

The Chan Survey: Settlement and Agriculture

Perhaps the most salient feature at Chan is the presence of extensive agricultural terracing covering all but the steepest and most level land. Terraces are found worldwide and are among the most fundamental solutions to farming in hilly areas. Control of water and soil moisture is often cited as the most important reason for creating agricultural terraces (Donkin 1979; Wilken 1987). As water travels downhill, particularly on hillsides with relatively shallow topsoils such as in the Maya area, it is difficult to maintain soil moisture, and water from heavy tropical rainfalls on denuded hillsides often concentrates in small channels, creating gullies and washing downhill before adequately penetrating the soil. Terraces, therefore, capture water that would normally travel quickly downslope, allowing it to collect on terraces' planting surfaces. This is accomplished through the creation of level planting surfaces and the construction of water channeling features, thereby slowing the movement of water downhill and guiding it to planting surfaces. Many agricultural terrace systems have channels that run across terrace beds as well as spillways down terrace walls that not only allow for the regular distribution of water over planting surfaces in drier spells but also control the flow of water from heavy rainfall to prevent damage to the terrace walls (Treacy and Denevan 1994).

As discussed in chapter 2, the Chan settlement survey mapped 1,223 terraces, which were grouped into 398 terrace sets (see figure 1.2). Two types of terraces were identified at Chan, each adapted to different slope and drainage conditions (see Donkin 1979; Treacy and Denevan 1994). The first and most common type, the contour terrace, comprised 90 percent of terrace sets. Contour terraces run perpendicular to the direction of a slope, turning a hillside into a wide staircase. Contour terraces are the most recognizable and prevalent of terraces throughout the world.

Comprising just 2 percent of terrace sets, cross-channel terraces consist of walls built across a seasonal drainage channel, allowing silt to accumulate and create a level planting surface as well as providing consistent moisture. Although few in number, cross-channel terraces can be quite large and are often prominent features in a terraced landscape. The remaining 8 percent of terrace sets at Chan contained complex terrace arrangements of both the contour and cross-channel types.

The types, heights and lengths, construction material, and placement of terraces in relation to settlement at Chan are quite diverse (see figure 1.2; also see chapter 2). Some sets of terraces presented an organized set of steps descending a hillside and could be quite extensive, extending in some instances for hundreds of meters and connecting multiple mound groups. Other terrace sets were simply one or two short terrace walls associated with a single mound. In some locations a series of cross-channel terraces existed seemingly isolated in a steep ravine with structures many meters distant, whereas in other locations contour terraces connected with cross-channel terraces in a complex arrangement quite close in proximity to mound groups. What is noteworthy about the terraced landscape at Chan is that, unlike other heavily terraced sites such as the Rio Bec region (Turner 1983), there are no apparent walls designating property divisions. In fact, terraces often extend through several household groups, suggesting that the management of these features involved multiple households and may have been organized cooperatively.

The majority of mounds were located in close proximity to terraces, with many sitting atop terrace beds and some conjoined with terrace walls. The configuration of dispersed households and adjoining terraces surrounded by apparent empty space represents a pattern consistent with a reliance on a system of infield agriculture or house-lot gardens (Killion 1992a: 125). Gardens are sites of intensive cultivation of crops year-round; they are located near to structures, as the amount of labor required is constant and substantial. Recent research has suggested that gardens provide a substantial contribution to household subsistence needs, often equaling that obtained from spatially larger outfields (for example, van der Veen 2005).

Gardens are characterized not only by their proximity to the residence but also by what Killion includes in the definition of a garden as "a polycultural mix of cultigens and useful economic species grown on small plots where the cultivator focuses on individual plants and their microhabitats by small inputs of labor on a continuous basis" (1992b: 13). Fertility is often maintained through the regular application of "food waste, excrement, and other debris produced by household members and dooryard animals" (1992b: 6). In brief, what characterizes gardens, and many other intensive infield systems, is high labor inputs in terms of handling of plants (for example, transplanting), weeding, and fertilizing, as well as greater investment in landesque capital, such as terrace walls, garden walls, raised beds, and others (Magcale-Macandog and Ocampo 2005; Mathewson 1984; Netting 1968, 1974).

The terraces near households and what we see now as empty space at Chan would therefore have likely been filled with gardens, orchards, and permanent, intensively managed fields (Lentz, Woods, and colleagues in chapter 5 discuss the botanical evidence for orchards at Chan). This apparent unsystematic and dispersed pattern on the landscape suggests that the terraces at Chan were not a planned system organized and constructed by a centralized authority but part of a process of organic, incremental growth reflecting local control of production. Gardens are not agricultural technologies subject to elite control but are indicative of household-level intensification (Smith and Price 1994).

Terrace Excavations

Excavations were carried out in four different locations at Chan to explore a representative sample of terrace use and construction (see figure 1.2; Wyatt 2008a). Each excavation area was chosen for its location in relation to the community center, the types of terraces present, the proximity of structures to the terraces, and the condition of the terrace walls (Wyatt 2004, 2005). Operation 4 was located north/northeast of the community center in an area of dense terracing, including both contour and cross-channel terraces, and with a single type 1 mound on the hillside adjoining a terrace wall. Operation 15 was located in the northwestern portion of the community, also an area of complex and extensive terracing and associated structures. Operation 18 was located on the east side of the community, with large cross-channel terraces over 3 m high, spatially distant from any structures. And finally, Operation 20 was located at a series of well-preserved cross-channel terraces located approximately 150 m north of the community center.

The goal of each operation was to obtain information not just on individual terrace walls but on how the entire system of terracing operated. Therefore, we excavated structures connected to terraces, explored water control features on terrace beds, and excavated terrace beds and hillsides lacking observable features. Our working model is that terracing is more than just a system of walls on hillsides, but part of a larger agricultural system. Explorations of systems currently in use (Kirch 1994; Lansing 1987) reveal a complexity of construction and use that go far beyond simple features for the prevention of erosion and the conservation of water, encompassing issues relating to ideology, kinship, and political economy (for example, Lansing 1987; Netting 1968). To accomplish this goal, it was necessary to conduct extensive excavations of terrace walls, planting surfaces, nearby structures, and other features relevant to ancient cultivation practices. Developing a greater understanding of land use strategies and local and regional economies requires more extensive excavations of agricultural features that will build a more robust data set and allow us to address these more complex questions (see Fedick 1996b).

Local Water Management: Evidence from Operation 4

Small-scale water management features were an important and integral element of the terraces at Chan. Although archaeologists often focus on large-scale water control systems, small-scale and locally controlled features are gaining notice (Johnston 2004; Lohse and Findlay 2000). The most extensive excavations of terraces, terrain, and associated structures were undertaken in Operation 4, which yielded a range of water control features. The Operation 4 area consisted of a series of contour and cross-channel terraces, a solitary structure (C-304), and three aguadas; Operation 4 is also part of a larger area in the northern part of the community with a complex arrangement of mounds, mound groups, and terraces (figure 4.1).

Excavations on the solitary mound revealed a structure whose function was the capture and temporary storage of water from a spring originating in the hillside (figure 4.2). Although few of these structures exist in the ancient Maya area, similar structures found throughout the world are termed "springhouses." Excavations uncovered multiple construction phases of the solitary structure, with the springhouse, dating to the Late Preclassic (350 BC to AD 100/150), representing the earliest phase. In later construction phases, the springhouse was filled in and converted to a residential building until its eventual abandonment by the end of the Terminal Classic around AD 900. In its early phase, water from a hillside spring passed into the structure through a small opening in the southeastern corner and collected in a stone-lined basin, which had a small spillway that allowed water to overflow. The basin only held between 15 and 20 liters of water, but the constantly running spring would have kept it full.

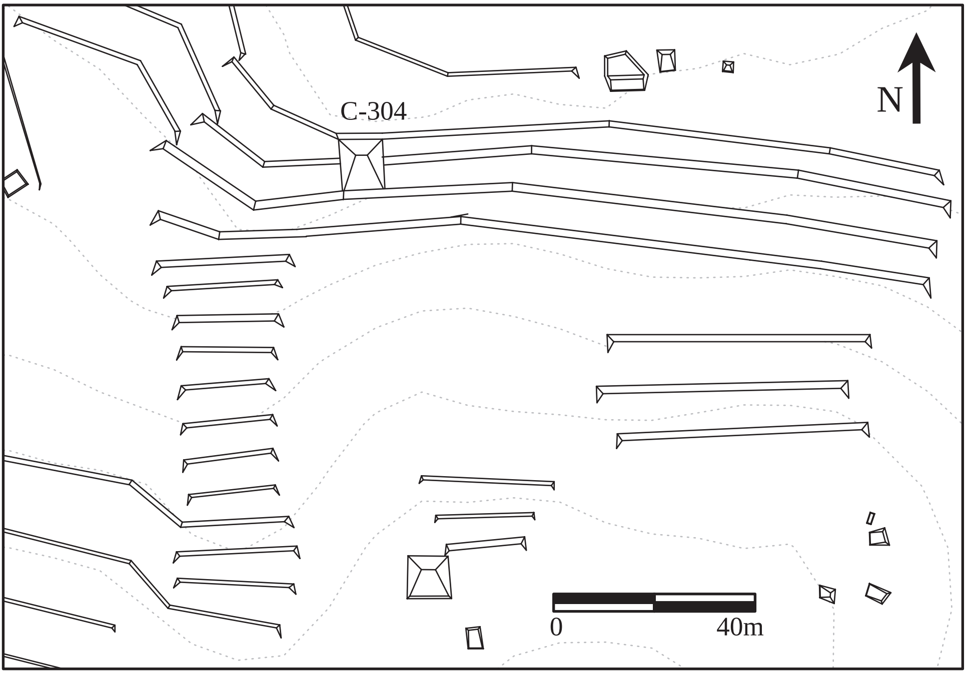

Figure 4.1. Operation 4 terraces and households. Four meter contour interval.

Springhouses are common in rural areas throughout the world and are generally used to provide a clean supply of drinking water and to store food at a uniform temperature. In the Maya area, Palenque contains a number of these structures constructed over springs, serving both ritual and secular functions (French 2007). Although access to clean water is clearly an important element in the capture of spring water, springs are also important loci of ritual in Mesoamerica (Sandstrom in press), and in Operation 4 modest offerings of lip-to-lip ceramic bowls and chert flakes were found both near the entrance of the water into the springhouse at the rear of the structure and near the water basin. The most likely explanation for the function of the springhouse is that it served both as a ready supply of water for household and agricultural use, and as a site of ritual importance.

Evidence of irrigation on the terrace beds was found approximately 50 m west of the springhouse, where excavations at the junction of two terrace walls revealed an irrigation ditch. Beginning with a small channel in the terrace wall, the ditch was constructed with unshaped stones placed on modified bedrock, although the channel became difficult to discern the farther we excavated from the terrace wall. One possibility is that the

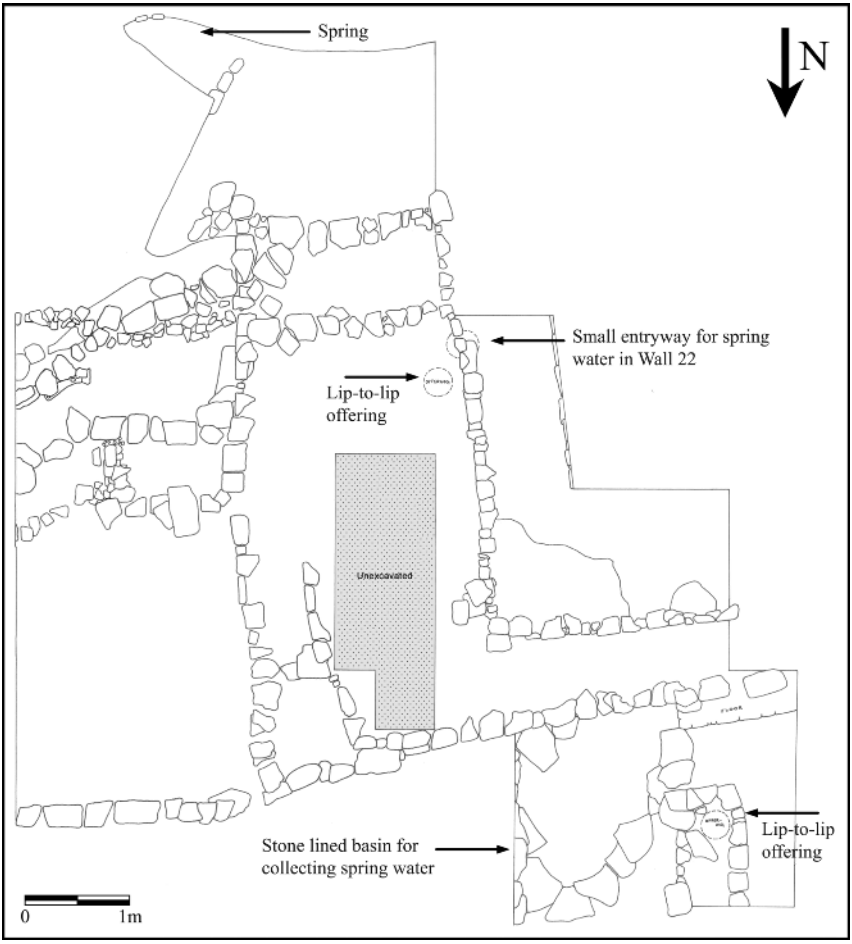

Figure 4.2. Springhouse. (Illustration by Andrew Wyatt.)

channel was converted into a "French drain" as it descended the hillslope; this would involve filling the channel with small gravel to allow the water to slowly percolate downhill, passing under the next terrace wall to the terrace bed below. Although we were unable to directly date this irrigation ditch, the terrace wall where the channel began was dated to the Middle Preclassic (BC 650–350).

Farther up the hill on a plateau was a series of three contiguous aguadas, each one slightly below the preceding one; as the upper aguada filled, it would have spilled over and filled the one immediately below. The aguadas measured approximately 3 m in diameter and were 1–2 m deep, which would have held a great deal of available water. Although no excavations were performed in between these aguadas and the irrigation ditch below, these large reservoirs may have been used to release water during the dry season to irrigate crops.

Finally, several small depressions on the terrace beds were excavated to explore features I termed *aguaditas*. These were shallow basins 1–2 m in diameter that hold a small amount of water for "pot irrigation," in which a bowl or gourd would be used to scoop up water and irrigate crops by hand. Excavations in one of these aguaditas uncovered a 2 m wide stone-lined basin approximately 30–50 cm deep that would have easily held 40–50 liters of water.

Immediately uphill from this aguadita we uncovered a small, round opening in the bedrock leading to a subsurface drainage. Although natural fissures in the bedrock are not uncommon in this karstic landscape, this particular opening had a small, flat stone placed over the top, suggesting that the farmers here were aware of this water source, possibly using it to fill aguaditas by blocking the drainage farther downstream. Explorations revealed another opening in the bedrock exposing the same underground stream approximately 5 m downhill. Although much smaller in scale, the utilization of underground aquifers at Chan is functionally similar to the *qanats* found in the Middle East (Ron 1985).

In total, the water management features at Operation 4 include the exploitation of natural springs and underground water resources, the collection of water in aguadas and aguaditas, and the construction of irrigation systems for watering agricultural terrace beds. Although each of these features is small-scale and often roughly constructed, as a whole they constitute a system of water management that is both extensive and complex.

The farmers at Chan clearly had an intimate knowledge of the landscape and long-term ties to the land. Construction of the terrace walls and the springhouse began in the Middle to Late Preclassic and continued throughout the history of the community. We cannot determine precisely when others of the water management features were constructed, but there is no reason to think they were built significantly later. Over Chan's history, farmers developed a deep knowledge of the local hydrology and geology, exploiting these resources for household and agricultural use. Based on this long chronology, the dispersed nature of the features, and the physical distance from centers of power, I suggest that the water control features at Chan were under local control rather than managed by elites from Xunantunich or even the leaders of Chan itself.

Terrace Chronology

Terrace construction at Chan was dated in two ways: directly through the identification of ceramics in fill episodes within terrace walls themselves and indirectly from ceramics in fill episodes from structures situated stratigraphically above terraces. Dating of structures adjacent to terraces was not used to date terrace construction, because of the possibility that adjacent features may not be contemporary. Ceramics for dating came from stratified deposits and represent the latest ceramics recovered in a deposit. Investigation of terrace construction and chronology indicated that some terraces were built up accretionally over time (figure 4.3).

The earliest evidence for terrace construction comes from Operation 4. Excavations in a terrace wall recovered stratified deposits of solely Middle Preclassic ceramics in the lowest strata. By Middle Preclassic times, occupation had begun at Chan with ritual use of its community center, as well as the construction of early households in its settlement area. Although there were few pressures on land in the Middle Preclassic, farmers may have begun constructing terraces utilizing trees or mounded earth to create small, ephemeral terraces that are undetectable today (for example, Magcale-Macandog and Ocampo 2005), as well as beginning to construct the stone-walled terraces now located throughout Chan. We often construe terraces as permanent stone structures; however, farmers will frequently create temporary structures before graduating to permanent ones (Donkin 1979; Hurni 1989; Liao et al. 1989).

Through the Late and Terminal Preclassic periods, terrace construction expanded at Operation 4. It is also during this time that the springhouse discussed above was initially constructed. The first evidence of settlement and terrace construction is identified at Operation 15 in the northwestern area of the community during this period as well.

Although the Early Classic is often recognized as a period of contraction in the Maya area, some Belize River valley sites, including Actuncan, Barton Ramie, Buenavista, Cahal Pech, and Pacbitun, show steady or expanding occupation (LeCount 2004a; LeCount and Blitz 2005). Chan has a significant Early Classic presence as well (see chapter 2). Both the Operation 4 and Operation 15 areas have an expansion of terracing and construction. At Operation 15, stratified deposits from a single terrace wall demonstrate that the terrace was almost entirely constructed during the Early Classic period, with only minor modification or continued use in the Late Classic, as evidenced by Late Classic ceramics recovered from surface levels.

Figure 4.3. Terrace wall in Operation 20 showing multiple construction phases. (Photograph by Andrew Wyatt.)

By the late Late Classic, all terraced areas investigated at Chan were occupied and show evidence of rebuilding and expansion. In particular, the terrace walls in Operation 18 and Operation 20 were constructed entirely in this period. The late Late Classic is the period of Chan's population maximum when farmers were occupying all areas of the community (see chapter 2). This period is also concomitant with the rise of Xunantunich as a polity capital, as well as a general rise in population throughout the entire Maya area. This sets up an interesting correlation between agricultural and population expansion at Chan and the florescence of Xunantunich. But the long history of agricultural expansion at Chan prior to the rise of Xunantunich demonstrates that the relationship between Chan's agricultural expansion and the rise of Xunantunich is not what is expected based on traditional anthropological models.

During the Terminal Classic period, Chan's population contracted, and concomitantly the only evidence for terrace use is found in the Operation 4 area.

Ecofacts and Fertilization Practices

The type, number, and distribution of ecofacts recovered from excavations on terraces aided in the interpretation of agricultural activities. Faunal and botanical analysis in particular provided information regarding fertilization practices and the relationship of the nearby households to the terraces.

Although a wide variety of archaeobotanical remains were recovered during excavation and flotation, fragments of pine wood (*Pinus* sp.) recovered from terraces in all operations allowed interpretation of how the agricultural soil was amended through the application of household refuse. Pine made up a small amount of the total charcoal remains by weight on terraces, as identified in domestic contexts across Chan (Lentz et al., ch. 5, this vol.). The pine fragments were extremely tiny, less than .01 g in weight and less than 1 mm in length, suggesting that the pine wood was completely reduced to ash rather than burned in situ. The presence of these pine fragments on the terrace beds represents household refuse in the form of ash that was transported from households and used to fertilize the agricultural terraces, a common practice in household gardens today (Wyatt 2008b).

Archaeologically, much of what we know regarding ancient Maya agricultural practices comes from soil chemistry analysis. Without the benefit of large amounts of animal waste to manure their fields, the ancient Maya would have needed to amend the soil with household and other refuse to keep it in constant production. Although few techniques would leave artifactual evidence in the soil, elevated phosphorus levels resulting from the application of this refuse suggest the use of fertilization (Terry et al. 2000). Studies have identified agricultural activity areas through the analysis of soil phosphate levels (Ball and Kelsay 1992; Dunning 1992; Dunning, Beach, and Rue 1997; Robin 1999) but have been unable to identify the source of these elevated levels. The identification of wood ash in the soil of agricultural fields provides us with further evidence of how the ancient Maya may have maintained soil fertility through the addition of household refuse.

A significant amount of jute shells (*Pachychilus* spp.) were also recovered on the terrace beds. *Pachychilus,* freshwater gastropods often consumed by the ancient and contemporary Maya as a significant source of protein, are commonly encountered in middens (Healy, Emery, and Wright 1990; Moholy-Nagy 1978; see Keller, ch. 13, this vol.). In the Operation 4, 15, 18, and 20 excavations, however, the total of *Pachychilus* shells recovered from terrace beds (*N*=82) surpassed those from all other contexts combined, including midden contexts (*N*=2). This disposal pattern suggests that *Pachychilus*, along with other less durable organic debris, was preferentially discarded on terrace beds.

The recovery of *Pinus* and *Pachychilus* on the terrace beds demonstrates that terraces were the location of the disposal of organic household refuse. This refuse was distributed on the terraces not only to keep a potential attraction for pests distant from the household but also to amend the intensively cultivated soils. This is important and valuable information as it both informs us of the cultivation practices of the farmers at Chan and how they were able to achieve continuous and high agricultural production, and also, utilizing the model of settlement agriculture discussed below, provides insight into more broad-scale agricultural management and household and suprahousehold organization principles.

Discussion

Terrace agriculture at Chan has a deep chronology; construction began in the Middle Preclassic and continued rather steadily as terraces were rebuilt, added to, and expanded through the Late Classic. Ceramic evidence from stratified deposits provides the material evidence for dating terrace construction, and the appropriation and utilization of natural springs and underground water resources attest to the intimate knowledge of the geology and hydrology of the area that also suggests a lengthy occupation. This chronology demonstrates that the terraced hillsides were not constructed rapidly as a response to rising populations or to external elite demands in the latter part of the Late Classic. What the evolution of the terraced landscape suggests instead is that the terraces were built in what Doolittle terms an *incremental* process (Doolittle 1984).

Doolittle considers incremental agricultural change as "gradual upgrading through small units of input over long periods of time" (Doolittle 1984: 125). This is significantly different from *systemic* change, in which "construction . . . is thought to involve inputs applied over short, discrete periods of time, and often to include planning, engineering expertise, and socially coordinated effort" (1984: 124). When people consider intensive agriculture and the agro-engineering features that are built during the intensification process, they often are referring to this systemic change.

Incremental change, in contrast, is wrapped up in the daily maintenance tasks of the farming household and its neighbors and is subsequently not a rapid process that involves the input of a centralized authority. It is an accretional process that takes place over a long period of time. Examining the chronological development of terraces, water management, and residential features excavated at Operation 4 in particular illustrates one example of the incremental growth of a local agricultural system. Operation 4 revealed the earliest evidence for terrace construction at Chan in the Middle Preclassic, and it is plausible that the local availability of water was a factor in the early settlement of the area. Throughout the Late and Terminal Preclassic periods, terrace construction expanded, the area surrounding the natural spring to the north was developed, and the construction commenced on the springhouse. Throughout the Early and Late Classic, terrace walls were expanded and the springhouse was converted to a domestic structure, possibly because of environmental changes resulting in the drying up of the spring, or possibly from the spring water being diverted elsewhere to increase production. Either way, by the late Late Classic period, the agricultural system in the Operation 4 area had reached its full extent with terraces, irrigation and drainage features, aguadas, and aguaditas. Operation 4, as well as other areas of terracing at Chan, demonstrates the incremental and accretional nature of the total agricultural system.

As Donkin and others have noted, terraces are for the most part constructed and managed at the household level (Donkin 1979), and Killion's concept of settlement agriculture provides the most accurate model of this practice (Killion 1992b). The settlement agriculture model explains a common settlement pattern found in the tropics where much of the cultivation of crops is undertaken in the area immediately surrounding the household in intensively managed infields (Zier 1992). The physical structures of a household are surrounded by a clear area where household activities take place, and gardens and orchards are situated immediately adjacent to this area.

The survey data for Chan suggests this model of settlement agriculture. Because terraces often extend through several household groups, the management of these features seems to have involved multiple households and may have been organized cooperatively. Structures are dispersed across the landscape, no significant nucleation of settlement occurs, and structures and their associated terraces are surrounded by areas of apparent empty space. In the settlement agriculture model, the terraces and the land surrounding the household would have been loci of intensive, permanent agricultural production, processing, and refuse disposal.

The important evidence of pine charcoal and jute shell on the terraces further suggests that the Chan terraces were intensively managed infields. Household ash and other organic food waste was saved and later distributed on the terrace bed surfaces to fertilize the soil and keep them in constant production, a labor-intensive process. In this sense, the terraces were managed like gardens. Although gardens are often characterized as the site of the cultivation of "supplemental crops," such as ornamentals, herbs, and medicinals, while staple crops are grown in more extensive fields (van der Veen 2005), gardens can be the locale of staple food production. If we disregard the definition of a garden based on what is grown, what characterizes a garden is the more intensive application of human labor to keep it in near-constant production. Located near the household, Chan's terraced gardens were subject to greater labor inputs, and the evidence of pine charcoal and *Pachychilus* shells for fertilization, the irrigation of terrace beds through a system of ditches and aguadas, and the presence of aguaditas for pot irrigation all point to high labor inputs.

The management of agricultural terraces at Chan, therefore, was undertaken at the household and cooperating household level, utilizing high labor inputs in the fields located adjacent to habitations. Terrace agriculture was an indigenous adaptation by the farmers at Chan, who employed this strategy gradually, in response to the demands of farming in a fertile but hilly landscape and their relationship with the world around them. The farmers at Chan were not static; they were not unchanging agriculturalists who persisted untouched over the centuries but rather expanded the size and complexity of their agricultural strategy from the Middle Preclassic through the Terminal Classic.

What is important to this discussion is that this local level of management precludes the involvement of direct external control. Nearby elites from larger political centers such as Xunantunich were not instrumental in the construction of the agricultural terraces (as the chronology suggests), nor were they immediately involved in the day-to-day operation of the terraces (as the settlement agriculture data suggests). Instead, Chan replicates the pattern of land use and development seen throughout the world by agricultural communities living by choice or necessity in hilly areas (Netting 1968, 1990) where a system of agricultural terraces begins small and develops incrementally through time into a fully cultivated landscape.

Conclusion

What is the relationship of Chan to nearby political centers—in particular, the site of Xunantunich, only 4 km distant, whose development as a polity capital coincides with the late Late Classic rise in population at Chan and its maximum expansion of agricultural terraces? Chan was clearly a functioning agricultural community long before Xunantunich's political apogee. Chan had been expanding, building terraces and irrigation systems, for over a millennium before the Late Classic period. This turns our traditional model of agricultural intensification and state development on its head in suggesting that Xunantunich did not arise through elite management and control of agricultural production. On the contrary, Chan already had a relatively high level of production, and incipient Xunantunich elites would have had to engage members of the Chan community concerning agricultural produce through political means. The farmers at Chan, therefore, were not passive farmers manipulated by elites to increase production and finance their activities but instead were active agents whose transformations of the landscape would have allowed a center such as Xunantunich to develop into a polity capital in the Late Classic.

5

Agroforestry and Agricultural Production of the Ancient Maya at Chan

DAVID LENTZ, SALLY WOODS, ANGELA HOOD, AND MARCUS MURPH

Excavations at the Chan community have revealed a remarkable paleoethnobotanical record that extends for two millennia, providing rich detail of past plant use practices in the upper Belize River drainage. Through the considerable time depth offered by the archaeological stratigraphy at Chan and a painstakingly recovered paleoethnobotanical assemblage, an extended chronological record of the plant exploitation strategies and regional forest history has gradually emerged. Analysis of more than 1,500 samples of macroremains and flotation-extracted plant materials from Chan brings to light shifting plant use practices and changes in forest extractive patterns from the Preclassic to the Early Postclassic periods.

The Chan community rests on the southern edge of an almost level limestone plateau in western Belize that is floristically and geologically similar to the southern half of the Yucatan Peninsula and the northern Petén region of Guatemala. Following the Holdridge system, the vegetation has been classified as subtropical moist forest (Hartshorn et al. 1984), but it is often described simply as lowland tropical forest (for example, Nations 2006). Variable soil conditions create a variety of vegetation subtypes in the region including savannas, marshes, and deciduous forests of varying species composition. In poorly drained low areas there are freshwater lagoons dominated by logwood or *tinta* trees (*Haematoxylon campechianum*). For the most part, however, the vegetation in the lands around the Chan community today is a mosaic of farmland and lowland tropical forest. Dominant forest species include *Manilkara zapota* (sapodilla or chico zapote), *Swietenia macrophylla* (mahogany), *Brosimum alicastrum* (breadnut or ramón), *Protium copal* (copal), *Chrysophila stauracantha* (give-and-take palm), *Bursera simaruba* (gumbolimbo), *Pimenta dioica* (allspice), *Calophyllum* *brasiliense* (Santa Maria), *Simarouba glauca* (negrito), *Metopium brownei* (black poison wood), *Attalea cohune* (cohune palm), *Acosmium panamense* (Billy Webb), *Spondias mombin* (hogplum), and other genera of tree species such as *Pouteria, Trichilia, Ocotea, Nectandra, Zanthoxylum, Sabal, Cocoloba*, and *Ficus*. A wide variety of small trees, palms, lianas, and shrubs make up the understory of the forest (Balick et al. 2000). Following clearance, terrain covered with tropical forest provides the preferred agricultural land because these forests are rooted in the most fertile soils of the region. The pronounced seasonality with both wet and dry seasons is a challenge for farmers in the area today because of the unpredictability of the onset of the rainy season, and it must have been so for the ancient Maya farmers at Chan, too.

Just 17 km to the south of Chan, in the headwaters of the Macal River, lies the pine ridge area, which represents the northern edge of the Maya Mountains. As the name suggests, the dominant vegetation in the pine ridge area is pine forest, probably much today as it was in Preclassic times. This region has soils derived from metamorphic and igneous parent materials that are highly weathered and extremely poor in nutrients. In general, the vegetation can be characterized as an upland savanna with a climatic pattern that is both cooler and drier than the region immediately to the north, which includes the Chan community. The forests of the pine ridge area are dominated by Caribbean pine (*Pinus caribaea* var. *hondurensis*), but there are stands of another pine species, *P. oocarpa*, in the southern part of the zone (Balick et al. 2000). Although the soils are not conducive to exploitation by agriculturalists, other valuable resources from this zone made it a target for extractive activities in ancient Maya times. For several centuries during the Classic and Preclassic periods, this area served as a source of useful commodities, such as slate, granite, and as indicated by recent research, pine forest products (Lentz et al. 2005).

Methods

Soil samples designated for processing by water flotation (10 liters per sample) were routinely collected from each cultural stratum excavated, then floated in a modified Ankara type flotation tank (Pearsall 1989) specially built for the Chan project paleoethnobotanical study. Macrobotanical remains observed during excavations were set aside, then packaged for shipment to the University of Cincinnati Paleoethnobotanical Laboratory for analysis. All ancient plant remains were examined with a Wild M5 binocular microscope adjustable from 6 to 60 magnifications. Burned wood or charcoal remains were particularly numerous among the plant remains recovered, and after careful examination and identification, we were able to determine what woods were used for construction and other purposes during pre-Columbian times. The study of these wood samples provides valuable insights into the ancient Maya agroforestry practices and their impact on the surrounding environment.

Initially, charcoal samples were sorted into wood types based on specific morphological characteristics, such as the arrangement of vessels, rays, and parenchyma cells. Scanning electron microscopy was employed in the analysis of Chan charcoal remains and other plant remains, as well. To begin the imaging process, small subsamples (1 cm^3) of each charcoal specimen were fractured along transverse and tangential planes. Selected charcoal specimens were mounted with colloidal graphite, coated with an ultrafine layer of gold and scanned in a Philips XL30 Environmental Scanning Electron Microscope (ESEM) at the University of Cincinnati's Department of Chemistry Electron Microscopy Facility. Micrographs were routinely recorded at 50× and 100×, but sometimes as high as 500× magnification. Wood specimens were identified through comparison with vouchered wood collections and text references (for example, Uribe 1988; Chichignoud et al. 1990).

Results

Despite the poor preservation properties at Chan, typical of an open site in the Maya lowlands, a relatively rich return of carbonized plant remains was retrieved by project archaeologists. Carbonized plant parts were identified from over 700 contexts. The most common among the macroremains was burned wood, but also recovered were seeds, fruits, rinds, floral buds, bark, and cotyledons. Plants were identified from 32 families; of these, 34 groups of retrieved plant remains were identified to the genus or species level (table 5.1). Contexts from which plant remains were recovered at Chan were highly variable, including refuse, terraces, structural collapse, fill, ceremonial structures, administrative structures, domestic structures, ancillary structures, burials, limestone quarries, and lithic production areas. Time periods with identifiable plant remains begin as early as the Middle Preclassic and extend to the Early Postclassic.

Table 5.1. Chan plant remains by family

Taxon	Common name	Parts found	Grams	Context
PINACEAE				
Pinus sp.	Pine, pino, ocote, huhub	Charcoal, resin	93.75	Administrative, ceremonial, domestic
DICOTS				
AMARANTHACEAE				
Amaranthus sp.	Bledo, calaloo, huisquelite	Seed	0.001	Administrative, ceremonial, domestic
ANACARDIACEAE				
Anacardium occidentale	Cashew, maranón, caju	Charcoal	0.13	Ceremonial
Astronium graveolens	Glassy wood, jobillo, palo mulato	Charcoal	1.51	Ceremonial
Metopium brownei	Black poison wood, chechem negro	Charcoal	0.07	Ceremonial
ANNONACEAE		Charcoal	1.34	Administrative, domestic
ARALIACEAE				
cf. *Schefflera morototoni*	Mountain trumpet	Charcoal	2.12	Ceremonial
ASTERACEAE		Achene, seed	0.04	Ceremonial
BOMBACACEAE				
cf. *Pachira aquatica*	Provision tree, Santo Domingo, zapoton	Charcoal	0.05	Ceremonial
BORAGINACEAE		Seed	0.01	Ceremonial
BURSERACEAE				
Protium copal	Copal, pom, pomte	Charcoal, resin	1.536	Ceremonial, administrative
CUCURBITACEAE				
Cucurbita sp.	Squash, calabaza, pumpkin	Rind	0.098	Ceremonial, domestic
FABACEAE		Seed, cotyledons	0.218	Ceremonial, domestic
Albizia sp.	Wild tamarind, jesmo, xiahtsimin	Charcoal	0.029	Ceremonial

cf. *Senna* sp.	Alexandrian senna, tinnevelly senna	Seed	0.019	Ceremonial
Haematoxylum campechianum	Logwood, tinta, ek	Charcoal	0.27	Ceremonial
Hymenea courbaril	Broken ridge locust, guapinol	Charcoal	4.625	Ceremonial
Piscidia piscipula	Dogwood	Charcoal	1.39	Administrative
Phaseolus sp.	Bean, frijol, chicun	Cotyledon	0.02	Domestic
FLACOURTIACEAE		Charcoal	0.46	Limestone quarry, domestic
LAURACEAE				
Licaria cf. *campechiana*		Charcoal	1.38	Administrative
Persea americana	Avocado, butter-pear, aguacate	Pit/cotyledon	1.279	Ceremonial, domestic
LECYTHIDACEAE				
Grias cauliflora	Bombowood, wild mammy, genip	Charcoal	0.099	Ceremonial
MALPIGHIACEAE				
Byrsonima crassifolia	Craboo, nance, chi, zacpan	Seed, pit, charcoal	1.563	Ceremonial, domestic
MALVACEAE		Seed	0.01	Domestic
MELIACEAE				
Guarea excelsa	American musk-wood, cramantee	Charcoal	0.7	Administrative, domestic
Swietenia macrophylla	Mahogany, caoba, chiculte	Charcoal	7.49	Domestic, agricultural
MORACEAE		Seed	0.01	Domestic
Brosimum alicastrum	Breadnut, capomo, ramón, ujushte	Charcoal	4.6	Ceremonial
MYRTACEAE		Bud	0.01	Domestic
OXALIDACEAE		Seed	0.01	Domestic
PHYTOLACCACEAE				
Phytolacca sp.	Wild calabash, coch-otón, telcox	Seed	0.047	Ceremonial, domestic
PIPERACEAE				

(continued)

Table 5.1—*Continued*

Taxon	Common name	Parts found	Grams	Context
Piper sp.	Spanish elder, cordoncillo	Seed	0.04	Ceremonial, domestic
Plantaginaceae				
Plantago sp.	Common plantain, llantén común	Seed	0.01	Ceremonial
Polygonaceae		Seed	0.001	Administrative
Rhamnaceae				
Colubrina arborescens	Nakedwood, snake-wood, greenheart	Charcoal	0.44	Ceremonial
Sapotaceae				
Manilkara zapota	Chicle, chico zapote, sapodilla	Charcoal	13.199	Ceremonial
Pouteria sapota	Mamee, sapote, mamey, saltule	Seed	1.14	Domestic
Pouteria sp.				
Simaroubaceae				
Simarouba glauca	Dysentery bark, aceituna, xpazakil, negrito	Pit	1.02	Domestic
Solanaceae		Peduncles	0.01	Ceremonial
Verbenaceae				
Vitex gaumeri	Blue blossom, matasano, yash-nik	Charcoal	0.198	Administrative
Vitaceae				
Vitis tiliifolia	Wild grape, bejuco de uva	Seed	0.093	Ceremonial
Hardwood		Charcoal, bark	453.083	Administrative, ceremonial
Monocots				
Arecaceae				
Acrocomia aculeata	Coyol, suppa	Endocarp	3.38	Ceremonial
Attalea cohune	Cohune, tutz	Endocarp, charcoal	29.314	Administrative, ceremonial, domestic
Poaceae				

Zea mays	Corn, maize	Kernel	0.073	Administrative, ceremonial, domestic
Unknown		Organic material, seeds, diseminules	0.875	Administrative, ceremonial, domestic

Annual Crop Species

The usual triad of beans, maize, and squash was in evidence at Chan although none were notably abundant. Cotyledon fragments of beans (*Phaseolus* sp.) were recovered from domestic spaces at Chan. Beans were one of the major annual crops of the ancient Maya, as paleoethnobotanical evidence from other sites attests (Lentz 1999). Although the number of beans (figure 5.1) recovered was small, it was probably a major crop for the Chan occupants.

Maize (*Zea mays*) kernels (figure 5.1), glumes, and cupules (parts of the cob) were found in the administrative structure (Structure 6), in ceremonial and domestic spaces, and in the planting bed of an agricultural terrace at Chan. As has been widely reported, maize was perhaps the principal staple crop for the ancient Maya. At the time of contact, the Yukatek Maya consumed maize as tamales or tortillas or as one of several kinds of beverages, described as *atolli* (a finely ground maize flour mixed with water then strained), *posolli* (a sour maize dough mixed with water), *pinolli* (made from toasted maize), and a maize-based beer (Coe 1994). The maize contexts observed at Chan could have resulted from any of these methods of preparation. Eating and drinking maize-based foods, especially beverages with alcoholic content, would have been associated with a variety of feasts and ceremonies, as well as routine household consumption.

Squash (*Cucurbita* sp.) rinds were found in domestic and ceremonial spaces at Chan. Squashes are among the principal food crops of the present-day Maya (Williams 1981; Breedlove and Laughlin 2000), and undoubtedly the same was true for the Chan inhabitants.

Weedy Species

Other Chan plant remains represent weedy species, from taxa such as *Senna* sp., *Amaranthus* sp., *Phytolacca* sp., *Plantago* sp., Oxalidaceae, and Polygonaceae. These plants probably gained a major foothold at Chan following

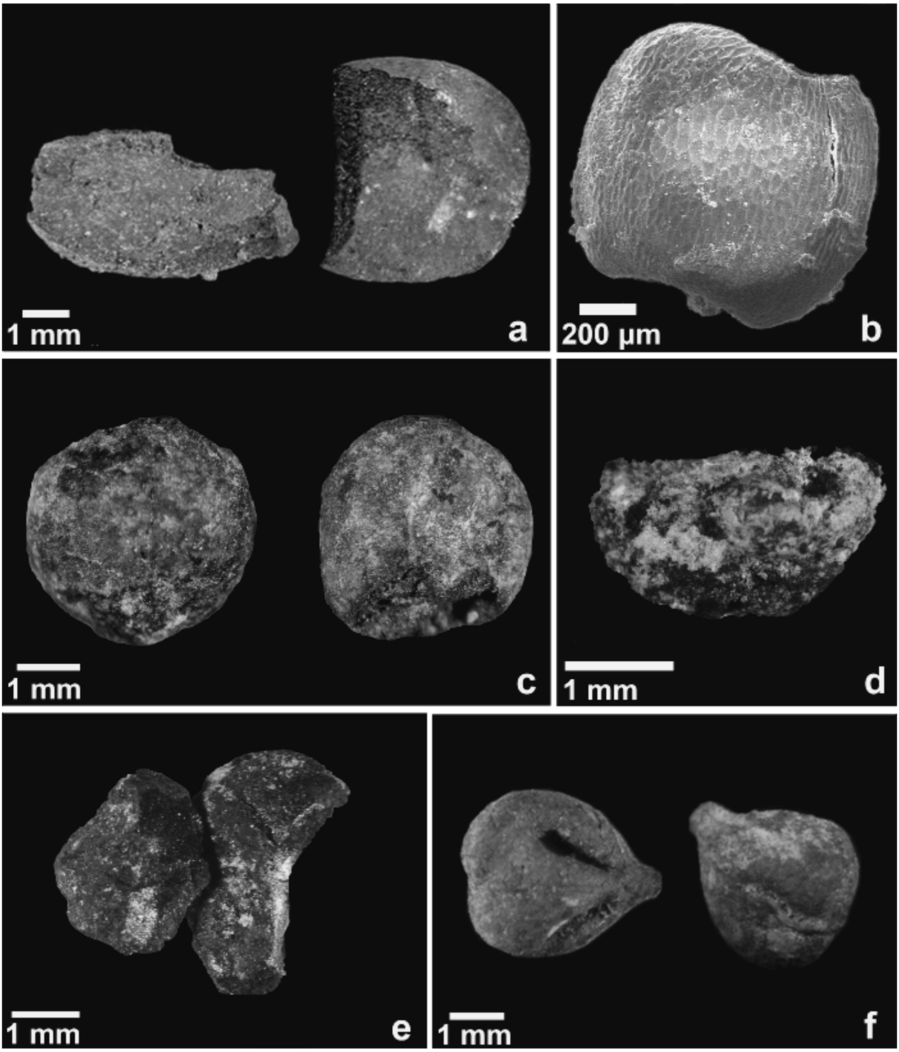

Figure 5.1. Light micrographs of Chan plant remains: (a) *Phaseolus* sp. (bean) cotyledons; (b) *Piper* sp. seed; (c) *Zea mays* (maize) kernels; (d) *Zea mays* cupule; (e) *Attalea cohune* (cohune palm) endocarps; and (f) *Vitis tiliifolia* (wild grape) pits. (Micrographs by David Lentz.)

land clearance for agriculture. The seeds may have been intentionally introduced to the site, as many of the plants can be used for food and other purposes, or they may have become mixed with the archaeological sediments through serendipity or inadvertent actions of the site occupants.

Tree Species

Many of the retrieved plant remains were in the form of burned wood. These wood items could have been introduced to the Chan community as fuel, structural material, incense, or components of artifacts. Trees represented in the charcoal collections include *Pinus* sp., *Anacardium occidentale, Astronium graveolens, Metopium brownei, Schefflera morototoni, Pachira aquatica, Protium copal, Albizia* sp., *Haematoxylon campechianum, Hymenea courbaril, Piscidia piscipula, Licaria campechiana, Guarea excelsa, Swietenia macrophylla, Brosimum alicastrum, Colubrina arborescens, Manilkara zapota, Pouteria* sp., *Vitex gaumeri*, and *Attalea cohune*. Some of these were cultivated tree species, while others were from “wild” or managed forest habitats. Following is a description of the ethnographic background of some of the more interesting tree remains from Chan.

Pine charcoal (*Pinus* sp.) was retrieved from sediments in predominantly ceremonial contexts at Chan representing all time periods. These observations parallel uses of pine observed at La Milpa (Hammond et al. 2000) and Xunantunich, where pine, probably an imported commodity, was associated with ceremonial activities in religious and high-status contexts (Lentz et al. 2005). The ritual use of pine also was observed in cave sites in the Belize Valley (Morehart et al. 2005). Because it produces copious amounts of smoke when it is burned, pine may have served as an essential component in ceremonial activities, especially when used in association with copal, an incense derived from the resin of the copal tree. The resulting display generating large volumes of smoke is a fundamental aspect of an assortment of Maya rituals. Pine splints, which functioned for the early Maya much as candles did in postcontact times, also were employed in healing rituals (Breedlove and Laughlin 2000).

Cashew charcoal (*Anacardium occidentale*) was found inside the east structure of Chan’s E-Group. A native of the eastern South American Amazon region (Mitchell and Mori 1987), cashew trees were introduced to Mesoamerica long before the arrival of Europeans. Because the tree is not native to Mesoamerica, the discovery of cashew wood in an archaeological context clearly indicates that the Chan farmers were planting orchards with domesticated tree crops in a pre-Columbian form of arboriculture. Evidence for cashew has been reported at other sites in Mesoamerica from Formative period deposits at the Yarumela site in Honduras (Lentz et al. 1997) and at the Cuello site in Belize (Miksicek et al. 1991). Even though we have no evidence for the fruits at Chan, the observed cashew wood demonstrates that the tree was being cultivated, and the fruits were likely being exploited. The fruits can be used in so many ways they would have been impossible to ignore.

Today, cashew cultivators in Central America begin harvesting fruit when the trees are four years old. They continue to harvest for the next twelve years and replant after the old trees have been cut down (Popenoe 1920). When an orchard has been cleared, the wood can be used for a variety of purposes; it is relatively strong and hard and has a lustrous surface when finished. Moreover, cashew wood can be easily worked, even by stone tools (Standley and Steyermark 1949). This secondary use of the orchard wood explains how it may have made its way into the activity areas of the Chan community. Although roasted cashew seeds are the most sought-after part of the fruit by North Americans and Europeans, a sweet wine called "vino de marañon" made from the fleshy stem (or hypocarp) is highly valued by Central Americans (Williams 1981). Probably this alcoholic beverage source was appreciated by the Chan occupants, as well.

Metopium brownei, or black poison wood, is a small- to medium-sized tree of the tropical forest. Locally it is well-known for its poisonous sap, which causes painful contact dermatitis in susceptible individuals, but the tree is also a source of medicine and excellent construction timbers if the wood is allowed to dry (Balick et al. 2000). At Chan, poison wood probably was used in the construction of ceremonial structures.

Burned copal wood (*Protium copal*) was found in ceremonial and administrative contexts at Chan. The tree is highly valued as a source of incense obtained from the resin, or sap (Standley and Steyermark 1946a). Often a principal component of modern Maya religious ceremonies and rituals, copal incense was without doubt used for similar purposes in ancient times (Williams 1981; Lentz and Dickau 2005). Copal trees and their products, being an integral part of Maya ritual life, may well have been protected, if not cultivated, in the area around Chan.

Byrsonima crassifolia, or nance, a small tree native to the neotropics, grows in dry or moist thickets at low elevations, generally below 1,500 m. It commonly grows in pine-oak forests, but often it is cultivated in dooryard gardens for its small, but juicy, pungent fruits that can be made into an alcoholic beverage or eaten fresh. The bark and wood of the tree are sources of red dye, tannin, and a treatment for diarrhea (Standley and Steyermark 1946a). Numerous nance pits were found in the terrace beds within the Chan community (Wyatt 2008a). Because nance pits were the plant parts identified, the fruits probably were consumed as a foodstuff at the Chan community, as seems to have been true for other sites in the Maya region (Lentz 1999; Trabanino 2010).

Charcoal from a dogwood tree (*Piscidia piscipula*) was found in Structure 6, the primary administrative structure in the Central Group. Ethnographic accounts inform us that the wood can be used as fuel, and the bark has been recorded as an effective narcotic or fish poison (Williams 1981). The burned dogwood at Chan (figure 5.2c,d) appears to have been part of a termination ritual associated with the closing off of the administrative structure. As the context and ethnographic information suggest, the dogwood charcoal may have been incorporated into this deposit because of its suitability as a fuel or because of its narcotic value.

Several domestic outdoor spaces and ceremonial contexts at Chan revealed the presence of avocado cotyledons (*Persea americana*). Avocado, a cultivated small tree that is native to Mexico and Guatemala, has been discovered at numerous other archaeological sites in Mesoamerica, for example, Albion Island (Miksicek 1990), Cerén (Lentz et al. 1996), Copán (Lentz 1991), Cuello (Miksicek et al. 1991), Pulltrouser Swamp (Miksicek 1983), Santa Leticia (Miksicek 1986), Tikal (Lentz 1999), and Wild Cane Cay (McKillop 1994). In addition to fruit consumption, the tree can be used in other ways: the bark can be made into a dye, the seeds can be used as a pesticide, oil from the fruits can be used for cosmetic purposes, and the rind can serve as a vermifuge (Standley and Steyermark 1946b). From the context of the avocado remains at Chan, it seems most likely that it was being consumed as a foodstuff.

Cordoncillo (*Piper* spp.) seeds (figure 5.1) were found in several contexts at Chan, mostly in the fill of domestic structures but also in the fill of the west structure of the E-Group (Structure 7). In one of the domestic structures, two seeds were found on a bench. The time periods for the seeds range from the Terminal Preclassic to the Early Postclassic. *Piper* is a large genus of small trees, vines, or understory shrubs of the tropical forest. Many of the plants in this genus are used for medicinal purposes, eaten fresh or combined with other foods as a spice (Balick et al. 2000). The ceremonial context of the cordoncillo seeds at Chan may indicate a medicinal application, while the domestic context implies a food consumption role for the plant.

Large amounts of chico zapote or sapodilla (*Manilkara zapota*) charcoal (figure 5.2e,f) were found in the east structure of Chan's E-Group, as well as in Structure 8 of the West Plaza, the administrative Structure 6, and a leading family residence at C-003, and may have been part of the structures themselves. Chico zapote, a dominant tree species of the tropical forest, constituted the majority of timbers employed in the construction of palaces and temples at Tikal (Lentz and Hockaday 2009). The practice of using chico zapote as a construction material in elite structures as seen at Tikal seems to have been exercised at Chan, as well. Although the only vaulted building at Chan was the administrative Structure 6, chico zapote likely was valued for its strength as a construction material in Chan's largely perishable structures, too.

Seed coats from the fruit of the sapote tree (*Pouteria sapota*) were recovered from midden deposits at Chan. The tree is native to the region and grows along streams and in moist forests. It is typically cultivated for its delicious fruits, but the tree also has other uses. It is a source of medicine, latex, poison, and construction material (Balick et al. 2000), and the seed kernels, which smell like almonds, are a rich source of oil (Standley and Williams 1967). The fruits are made into a sweet wine in areas of Mexico (Bruman 2000). Because the seed coat fragments were found in kitchen refuse at Chan, it seems likely that the fruits were eaten fresh or perhaps made into wine.

Endocarps (a portion of the fruit) of coyol (*Acrocomia aculeata*) were found in ceremonial contexts at Chan in both the Central Plaza and the east structure of the E-Group. The kernels of coyol are a source of cooking oil or can be eaten fresh, the sap can be made into wine (Breedlove and Laughlin 2000), and the coyol palm "cabbages" are edible (Williams 1981). The sap has several medicinal applications (Orellana 1987), and there is substantial evidence that the palm was cultivated by the ancient Maya at Copan (Lentz 1990, 1991). Coyol remains have been recovered from archaeological contexts at numerous other Maya sites, as well (Lentz 1999). The coyol endocarps found at Chan appear to have been the by-product of some kind of food processing activity.

Cohune palm fruits (*Attalea cohune*) were found in the east structure of the E-Group, the Central Plaza, the administrative Structure 6, and domestic structures. Cohune is a palm of the lowlands of Belize and is common

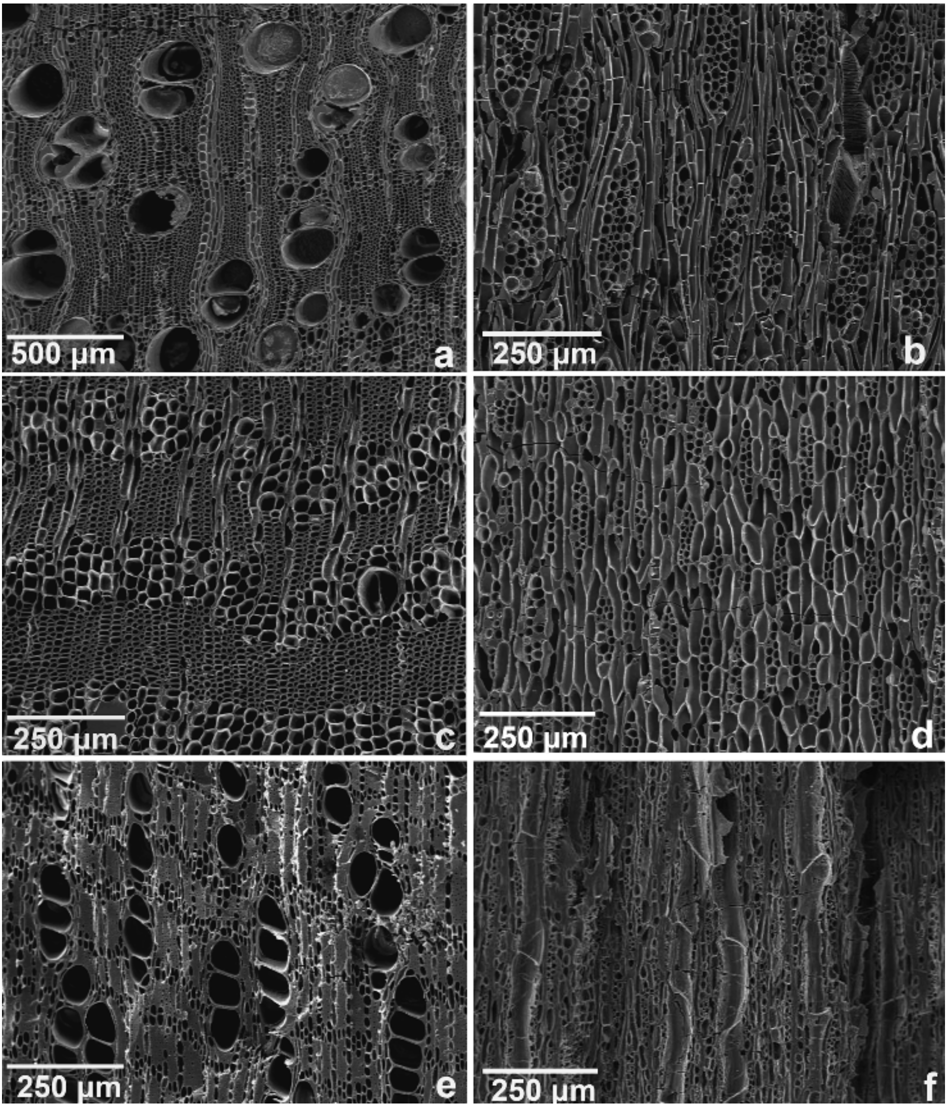

Figure 5.2. Scanning electron micrographs of carbonized wood from the Chan site: (a) *Swietenia macrophylla* (mahogany), transverse section; (b) *S. macrophylla*, tangential section; (c) *Piscidia piscipula* (dogwood), transverse section; (d) *P. piscipula*, tangential section; (e) *Manilkara zapota* (chico zapote), transverse section; and (f) *M. zapota*, tangential section. (Micrographs by David Lentz.)

in the Chan area. Cohune seed kernels are a rich oil source, the sap can be made into wine, the leaves are widely used for mats and thatch, and the trunks can be used as a construction material (Standley and Steyermark 1958). Judging from the contexts where remains were found at Chan (table 5.1), cohune was used for food and in house construction. Cohune fruits, a widely recognized resource, have been identified at other ancient Maya settlements, such as Wild Cane Cay (McKillop 1994), Pulltrouser Swamp (Miksicek 1983), and the Petexbatun area (Lentz 1999).

Today, mahogany (*Swietenia macrophylla*) is widely recognized as one of the main forest products of Belize. Its timbers are highly prized as the premier wood for furniture and cabinet manufacturing, and it is perhaps one of the most sought-after hardwoods in the world (Williams 1981). Although Hartshorn and his colleagues (1984) describe mahogany as a forest dominant in Belize, today stands with mature mahogany trees are becoming scarce because of several centuries of extensive overharvesting. Nevertheless, it remains one of the important timber exports of Belize. Despite shrinking numbers of mahogany trees due to intensive selective cutting in the modern forests of Belize, this moist tropical forest tree appears to have been readily available to the inhabitants of Chan during Maya times, as evidenced by the discovery of mahogany charcoal remains from mature trees during the late Late Classic and Terminal Classic periods. It would have been difficult for the ancient Maya to process such large trees with stone axes, but the charcoal evidence from Chan makes it clear that they did. Mahogany was found in domestic, ritual, and agricultural terrace contexts.

The charcoal from a breadnut or ramón tree (*Brosimum alicastrum*) was associated with the termination ritual feature in the east structure of Chan's E-Group. Ramón is a common tree of the tropical forests of Belize, and the wood is often used in construction (Williams 1981). The fruit and seeds are edible but are regarded by modern Maya as a famine food because of the mealy texture and insipid taste. Nevertheless, the plentiful and nutritious seeds have been discussed as an important subsistence component for the ancient Maya (Puleston 1968); support for this hypothesis is unavailable at Chan because no seeds were found, only charcoal.

When examined as a whole, wood exploitation at Chan reveals some interesting contextual and chronological patterns. If we compare the amount of the major types of wood represented at Chan—hardwood (from broadleaf trees), palm, and pine—there are significant differences in how wood appears to have been used in different contexts (table 5.2). As noted above, pine is most common in ceremonial contexts, probably because of its value

Table 5.2. Chan wood remains listed by context

Context	Hardwood	Palm	Pine	Total number
		Ubiquity of contexts		
	N	*N*	*N*	*N*
Ceremonial	162	8	159	263
Administrative	62	1	28	80
Domestic	151	6	20	162
		Percentage of weight in grams		
	%	%	%	gr
Ceremonial	53.8	3.2	43.0	221.970
Administrative	90.7	0.7	8.6	129.485
Domestic	99.1	0.2	0.7	248.341

in producing smoke for the community-wide ceremonies that would have taken place in Chan's Central Group and other ceremonial locations. Pine is found in lower frequencies in administrative and domestic contexts. The pine found in terrace beds consists only of tiny fragments, which Andrew Wyatt (ch. 4, this vol.) suggests were intentionally introduced there as soil amendments. Hardwood is the dominant wood used in domestic contexts, likely because of the wide range of fuel, building construction, furnishing, and tool manufacturing uses that it would have provided for farming families. Both pine and hardwoods seemed to have been employed in administrative contexts, likely due to the unique range of activities involved in the administration of the community. Given that different kinds of wood had different functions and meanings for the ancient Maya, it is unsurprising that Chan's residents would have used different types of wood in different aspects of their lives. The distinction in wood use in ceremonial and domestic contexts at Chan is mirrored by the differences in activity areas identified in each of these contexts through soil chemistry studies (Robin et al., ch. 7, this vol.) and patterns of the deposition of caches and burials (Novotny, ch. 12, this vol.; Kosakowsky et al., ch. 15, this vol.).

The use of hardwood species underwent change through time at Chan. If we compare the amount of wood used during the Preclassic period to the Classic period, hardwood use was much greater in Classic times. If we use a two-tailed t-test to compare the weight of hardwood charcoal between the two time periods, the differences are highly significant (p=0.0103). Table 5.3 illustrates the observation that the use of hardwood charcoal expanded in the Classic period, particularly during Late and Terminal Classic times.

Table 5.3. Chan wood remains listed by time period, ubiquity, and weight

Time period	Hardwood	Palm	Pine		Domestic	Administrative	Ceremonial	
	Ubiquity				Contexts represented			Total
	N	*N*	*N*		*N*	*N*	*N*	*N*
Middle Preclassic	2	0	9		0	0	10	10
Late Preclassic	28	2	38		2	3	51	56
Terminal Preclassic	21	2	30		4	0	37	41
Early Classic	13	0	12		3	0	15	18
Early Late Classic	20	1	18		9	2	20	31
Late Late Classic	116	3	20		98	3	22	123
Terminal Classic	120	5	35		29	67	29	141
Early Postclassic	6	0	3		0	0	7	7
	Percentage of weight in grams				Percentage of context types			
	%	%	%	gr	%	%	%	*N*
Middle Preclassic	8.6	0.0	91.4	0.116	0.0	0.0	100.0	10
Late Preclassic	39.4	0.1	60.5	46.800	3.6	5.4	91.0	56
Terminal Preclassic	44.2	0.6	55.2	25.434	9.8	0.0	90.2	41
Early Classic	41.4	0.0	58.6	23.998	16.7	0.0	83.3	18
Early Late Classic	64.4	1.2	34.4	9.023	29.0	6.5	64.5	31
Late Late Classic	98.0	0.3	1.7	155.571	79.7	2.4	17.9	123
Terminal Classic	89.3	3.1	7.6	201.716	20.7	47.9	31.4	141
Early Postclassic	80.3	0.0	19.7	15.628	0.0	0.0	100.0	7

The use of pine at the Chan site shows a different pattern. If we apply the same statistical test to pine charcoal comparing use during the Preclassic to the Classic period, we find no statistical differences. If we look at pine charcoal weights from the two time periods, the results (p=0.3618) indicate that the use of pine at Chan did not change much through time, even into the Late Classic and Terminal Classic periods.

It is important to note, however, that the wood we find from excavations comes from particular contexts. Looking at table 5.3, we see that the chronological changes in wood use are also related to context types. In the Preclassic period, where there were high numbers of ceremonial contexts excavated and low numbers of domestic and administrative contexts excavated, lower amounts of hardwood were found. In the Late Classic period of expanding population, domestic contexts made up a larger portion of the community and were the focus of excavations where higher amounts of hardwood were found. Thus, the observed temporal changes may have been a result of the types of contexts excavated at the Chan community in successive time periods rather than changing preferences or availability. Having said this, our sense of the pattern of wood use through time at Chan reflects the role of the different wood types in the ceremonial and domestic lives of the occupants. Use of the locally available hardwoods expanded into the Late Classic period as the population grew, with a concomitant growing need for fuel and construction material. Pine, however, likely obtained from the distant pine ridge, served more of a ceremonial function and may have been reserved for special occasions where bulk quantities were not required, thus appearing in more even quantities in the archaeological record.

Discussion

The subject of ancient Maya agroforestry activities has been the topic of considerable discussion in the archaeological literature (for example, Wiseman 1978; Fedick 1996a; Ford and Nigh 2009). These previous assessments, which provide essential guideposts on the topic, are largely based on ethnographic analogy or pollen evidence. Ethnographic evidence is extremely helpful in interpreting specific situations that are uncovered through archaeological excavation, but as we understand more about the ancient Maya it is becoming increasingly evident that agricultural and forest management practices of the traditional Maya farmers of today are not identical to those of the ancient Maya. Pollen data, although excellent at showing broad trends in vegetation changes through time, presents only a partial picture of the landscape dynamics of the past, largely because most forest trees and even some crop plants are zoophilous (that is, pollinated by bats, insects, or other animals) and produce pollen that will rarely, if ever, appear in any pollen profile extracted from ancient sediments. Also, pollen often cannot be identified to species, so the taxa represented in assessments must remain generalized. The identification of charcoal from archaeological deposits, however, which can be identified to species, helps to fill this information void and, hopefully, will add new insights into the discussion of ancient Maya agroforestry and agricultural traditions.

In the late Late Classic and Terminal Classic periods at Chan, significantly more hardwood is found than in other time periods. On one hand, increasing hardwood use in the late Late Classic period would be expected because the Chan population expanded considerably during this period, that is, more people created a greater demand for resources. But the use of pine wood was not observed to increase proportionately with the human population expansion. Other factors were at play in the pattern of wood use, and probably the accessibility and low cost of the locally available hardwoods versus the pine wood brought in from a distance contributed to this observed variation in usage pattern. Variations in the number and type of contexts excavated from one time period to another also may have contributed to this apparently divergent pattern in wood use.

What is most interesting about the plant use patterns we see at Chan is the species of hardwood trees being exploited and the order in which they appear in the archaeological record (table 5.4). For example, chico zapote appears in Preclassic deposits and also is found regularly throughout the Classic period into the Terminal Classic. From studies at Tikal (Lentz and Hockaday 2009), chico zapote appears to have been a preferred building material in temples and palaces. It was one of the few woods in the tropical forest that could withstand the weight of heavy stone roofs and had the added feature of being easily carved when the tree had been freshly cut. Because it was such an important tree to the ancient Maya, it seems likely that they would have protected the seedlings of the tree or may even have cultivated it, as proposed by Lundell (1937). Whatever the management practice, it is evident that the Chan occupants did not run out of this essential resource despite regular exploitation over many centuries. In contrast, at Tikal around AD 741, temple builders switched from using the large-growing chico zapote to a seasonal wetland species, *Haematoxylon campechianum*, in their construction projects (Lentz and Hockaday 2009),

Table 5.4. Chan hardwood species listed by time period

Time period	*N*	Genera and species
Late Preclassic	56	*Manilkara zapota, Pouteria* sp.
Terminal Preclassic	41	*Manilkara zapota*
Early Classic	18	*Anacardium occidentale, Manilkara zapota, Metopium brownei,* Sapotaceae
Early Late Classic	31	Amyris, Spermatophyta
Late Late Classic	123	Annonaceae, aquatic plant, *Manilkara zapota, Swietenia macrophylla*
Terminal Classic	102	Annonaceae, Flacourtiaceae, *Guarea excelsa, Manilkara zapota, Swietenia macrophylla*
Building termination	38	*Albizia* sp., Annonaceae, *Astronium graveolens, Brosimum alicastrum, Byrsonima crassifolia, Colubrina arborescens, Grias cauliflora, Guarea excelsa, Licaria* cf. *campechiana, Manilkara zapota, Piscidia piscipula, Pouteria* sp., *Protium copal,* Sapotaceae, *Schefflera morototoni, Vitex gaumeri*
Early Postclassic	7	Spermatophyta

and the likely reason is that they exhausted the primary resource, chico zapote, and were forced to switch to an alternative.

Another intriguing aspect of the wood remains from Chan can be found in the large diversity of tree species represented in two features associated with rituals that terminated the use of the Central Group buildings at the end of the Terminal Classic period. The first was the diviner's room (Room 2) in Chan's administrative building, which was carefully covered by a fine lens of *sascab*, and the second was an adjacent vaulted passageway, which was also deliberately filled (Robin et al., ch. 7, this vol.; Kosakowsky et al., ch. 15, this vol.). In these termination ritual contexts, we find wood remains from the following trees: *Astronium graveolens, Brosimum alicastrum, Grias cauliflora, Guarea excelsa, Manilkara zapota, Swietenia macrophylla*, and others. These are not second-growth, pioneer species; rather, they reflect a mature, closed-canopy, tropical forest. Mahogany is especially interesting because it is a huge tree that can grow to 45 m in height (Standley and Steyermark 1946a) and the seedlings will prosper only in the shade of other tall trees (Aguirre de Riojas and de Poll 2007). Mahogany was not widely used by the ancient Maya (Lentz 1999), and its celebrity as a furniture wood is largely postcontact. It probably was common in Belize in Late Classic times, but it would only have been found in the context of mature stands of moist tropical forest. Many of the mature, closed-canopy, tropical forest trees identified in these two deposits were not identified in any other of the Chan samples. That these trees existed at the end of major occupation of the Chan community suggests that there were still substantial stands of mature tropical forest nearby and that the residents managed their landscape in a way that kept some of the forest intact even during periods of population growth when the demand for agricultural lands would have been greatest.

The agricultural picture at Chan is one where the inhabitants relied on a combination of annual crops (maize, beans, and squash) and an assortment of fruit trees (nance, avocado, cashew, zapote, coyol palm, and cohune palm). Annual crops appear to have been cultivated on terraces, as evidenced by the presence of maize remains in one of the terrace beds. Alternatively, the annual crops may have been planted in plots adjacent to house compounds, as seen at Cerén (Lentz et al. 1996; Lentz and Ramirez-Sosa 2002). Tree crops also seem to have been associated with the terraces, as evidenced by the nance pits in several terrace beds. Alternatively, the fruit trees could have been grown as orchards surrounding the house compounds, as recorded at the Cerén site (Lentz and Ramirez-Sosa 2002) and as observed ethnographically among the early historic Maya (Coe 1994).

A comparison between the paleoethnobotanical discoveries found at Cerén and Chan is worth mentioning. Because of the rapid ash fall of the Loma Caldera volcano (Sheets 2002), the plant materials at Cerén were well preserved. Not only were plant remains recovered from activity surfaces and vessels where they were stored, but also the technique of applying dental plaster to holes in the tephra during excavation revealed an abundance of garden plants in the house compounds exactly where they were planted before the volcano erupted. In many ways, plants used at Cerén were left in situ, and the result was a bounty of information about plant-use practices of the ancient Maya. In terms of preservation properties for plant remains, Chan was more typical of open sites in the Maya lowlands. The conditions for preservation were relatively poor, as seen in the infrequent recovery of remains of the principal annual crops. Cultigens like peppers, cacao, and cotton, observed at Cerén and other sites, were absent at Chan. Like Cerén, however, because a careful systematic archaeological plant recovery strategy was put in place at the inception of the Chan project, a large number of plant remains was recovered for analysis. This serves as a valuable example for studies at other sites in the Maya lowlands; informative plant remains can be recovered if a focused plant recovery effort is planned before excavations begin.

In summary, the paleoethnobotanical record provides substantive data that help elucidate the nature and extent of farming and agroforestry practices at Chan. We see unquestionable evidence for the production of annual crops and numerous fruit trees, verifying the traditional Maya agricultural subsistence base coupled with the development of arboricultural initiatives. The terraces at Chan were planted with both annual crops and tree crops, although other kinds of planting regimens also may have been employed. The tropical forests seem to have been managed effectively, as seen by the presence of mahogany and other forest dominants, such as chico zapote, until the end of the major occupation at Chan. These indications of forest management at Chan offer an interesting counterpoint to evidence at other sites, such as Tikal, where it has been suggested that extensive forest clearance contributed to the demise of the Late Classic Maya in that community. Comparison of these data sets underscores the idea that the fate of each Classic period Maya polity was not monolithic and the causality of the widespread depopulation and community abandonment at the end of the Classic period may well have occurred in different areas for different reasons. Although some polities of the Late Classic Maya realm may have collapsed because of excessive environmental depletion exacerbated by exponential human population growth, the abandonment of other polities, like Chan, may have occurred for other reasons, such as the disruption of trade routes or external factors that fomented political disintegration. Whatever caused the abandonment of Chan, the paleoethnobotanical evidence suggests that the precipitous population decline was caused by factors other than widespread deforestation and concomitant environmental degradation.

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Life in a Farming Community Center

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6

Ritual in a Farming Community

CYNTHIA ROBIN, JAMES MEIERHOFF, CALEB KESTLE,
CHELSEA BLACKMORE, LAURA J. KOSAKOWSKY, AND ANNA C. NOVOTNY

This chapter explores ritual practices at Chan's Central Group and its E-Group. Chan's community center, with its 5.6 m high east temple, is not remarkable from the perspective of the broader Maya world. But Chan's residents imbued this place with sacred significance, which continued across the community's 2,000-year history while the fortunes of royal sacred centers in the vicinity waxed and waned (Robin et al. 2005). The history of ritual at Chan demonstrates that farmers in farming communities innovated many of the rituals archaeologists initially recognized as Classic period royal rituals. As our archaeological research uncovers Chan's ancient ritual significance not just for scholars but also for contemporary Belizeans, the site once again is becoming a locale for modern farmers' rituals.

Ritual, religion, and worldview are key aspects of any society. Yet archaeologists traditionally consider it difficult to understand ancient ritual and beliefs and question how we could demonstrate the thoughts of now-deceased people. Increasing interest in the subject of Maya worldview over the past decades produced a plethora of information on the ritual practices of the upper echelons of Maya society (for example, Ashmore 1991; Ashmore and Sabloff 2002; Martin and Grube 2000; Schele and Freidel 1990; Schele and Matthews 1999). In part this is because the Maya nobility recorded their religious beliefs in hieroglyphic writing and elaborate artistic media. For these social strata, ritual was a key aspect of social and political life and the organization of large civic-centers.

Still scholars questioned if, in the absence of ancient texts and images, we can understand Maya farmers' rituals and beliefs. Just a decade ago, Johnston and Gonlin (1998) noted in a review of the meaning of commoner houses that our ability to understand commoner worldview through their poorly preserved houses has yet to be demonstrated. Are farmers simply the masses that filled the open plazas of large Maya civic-centers? What role did ritual and religion play in farmers' lives? Did farmers understand the religious pomp and circumstance performed at Maya civic-centers? Could farmers' popular religion have had an impact on Maya state religious practices?

Over the past decade, Maya studies have begun to answer these questions (Gonlin and Lohse 2007; McAnany 2004a; Plunket 2002; Robin 2003). Understanding ritual in the absence of the texts and images that Maya royalty left behind is certainly a more difficult task. But just as Maya royalty and nobility expressed their beliefs in material media and their ritual practices left behind material traces, the rituals and beliefs of other social strata are found in the material traces of their practices. Ritual can certainly be a monumental practice, but it can also be an ordinary practice, involving ordinary places and things (for example, Blackmore 2011; Brady and Ashmore 1999; Brown and Sheets 2000; Gonlin and Lohse 2007; Lohse 2000; Lucero 2010; McAnany 2004a; Mock 1998; Plunket 2002; Robin 2002a; Walker and Lucero 2000). Archaeologists willing to look for ritual in ordinary places, activities, and things can discern the religious practices of all members of a society.

Research at Chan reveals information on the religious practices and worldview of Maya farmers—from the views of the humblest farmer to those of community leaders (for example, chs. 4, 8, 9, 12, 13, and 15, this vol.). This chapter focuses on the organization and practices of community-scale ritual that took place in its Central Group under the auspices of Chan's leaders. Here we bring together the work of a number of researchers. Jim Meierhoff, Caleb Kestle, Chelsea Blackmore, and Ethan Kalosky supervised excavations at Chan's Central Group (Blackmore 2003; Kestle 2004, 2005; Meierhoff et al. 2004). Laura Kosakowsky (2006, 2007, 2008, 2009, and ch. 3, this vol.) undertook ceramic analysis and chronological assessments, and Anna Novotny (2007, 2008, and ch. 12, this vol.; Novotny and Kosakowsky 2009) conducted osteological analysis.

Chan's Central Group

The Central Group and West Plaza make up Chan's community center (figure 6.1). The Central Group is the largest architectural complex at Chan and was its main location for community-level ceremony, administration, and adjudication. As well, it houses a residence for Chan's leading family.

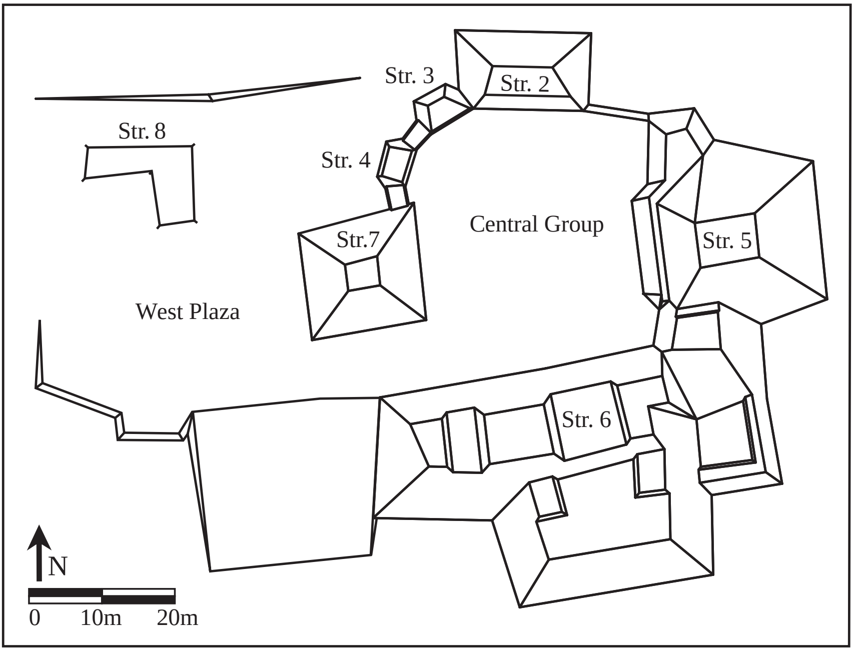

Figure 6.1. Chan's community center.

It is located at the spatial and geographical center of the community and is situated on the summit of Chan's central and high hilltop (see figure 1.2).

The Central Group has a long construction and use history spanning the Middle Preclassic to Early Postclassic periods (650 BC–AD 1150/1200; Kosakowsky 2006, 2007, 2008, 2009, and ch. 3, this vol.). During the Middle Preclassic period (650 BC–AD 100/150), the Central Group was a largely open space. Its plaza (the Central Plaza) was the focus of ritual activities. Located at the north and south ends of the plaza were two low stone residential structures rising 25 and 20 cm in height, respectively, that would have supported perishable buildings. Through time, additional structures were constructed around the plaza, and they grew in size. At the height of its construction in the late Late Classic period (AD 670–800/830), the Central Group consisted of six structures surrounding a plaza that had an area of 1,154 m^2. By this time, access to the Central Group was restricted to two entryways, one at the northeast corner and the other at the southwest corner of the group, the latter of which leads to the West Plaza. Through most of Chan's history, the Central Group was its sole community-level ceremonial space. But during the Late Classic period (the period of Chan's peak in settlement) and through the Terminal Classic and Early Postclassic periods, the largely open West Plaza became an additional community-level ceremonial space for residents, which increased access to ceremonial life for the growing populace (Cap, ch. 8, this vol.). At this time the west structure of the Central Group, Structure 7, became the central structure of a dual-plaza center.

At the end of the Late Classic, on the north edge of the Central Plaza was a residence of Chan's leading family and two associated ancillary structures (Structures 2, 3, and 4). Located on the south edge of the Central Plaza was a range structure with a vaulted roof (Structure 6), the only vaulted building at Chan, which was used for administration and adjudication. The history of these two structures is the topic of the next chapter (chapter 7).

On the east and west sides of the Central Group is an E-Group with a tripartite east structure (Structure 5) and a single west structure (Structure 7). E-Groups are specific types of paired east and west ritual structures in which the east structure is a tripartite construction and the west structure is a single construction. These distinctive architectural complexes are common throughout the Maya area, and their particular architectural configuration was inspired by agricultural rituals (Aimers and Rice 2006). They were venues for ritual and ancestor veneration and possibly have astronomical functions (Aimers 1993; Aimers and Rice 2006; Aveni and Hartung 1989; Chase and Chase 1995; Cohodas 1980; Laporte and Fialko 1990; Ricketson 1928). Chan's E-Group is the architectural focus for community-level ritual and ancestor veneration, but any astronomical function is purely speculative.

Directionality, Site Planning, and Maya Cosmology

The layout of Chan's Central Group in terms of formality, functionality, and directionality is comparable, albeit at a smaller scale, with that seen at larger centers across the Maya area. With the exception of a ball court, Chan's Central Group houses all ritual, residential, and administrative functions identified at central groups within larger Maya sites—indicating that it is a "full-service" community center.

Wendy Ashmore (1991) documents a relationship between cardinal directionality, site planning principles, and underlying cosmological ideas at major centers throughout the Maya area. In constructing their cities and placing particular types of buildings in north, south, east, and west locations, Maya royalty referenced cosmological understandings to make

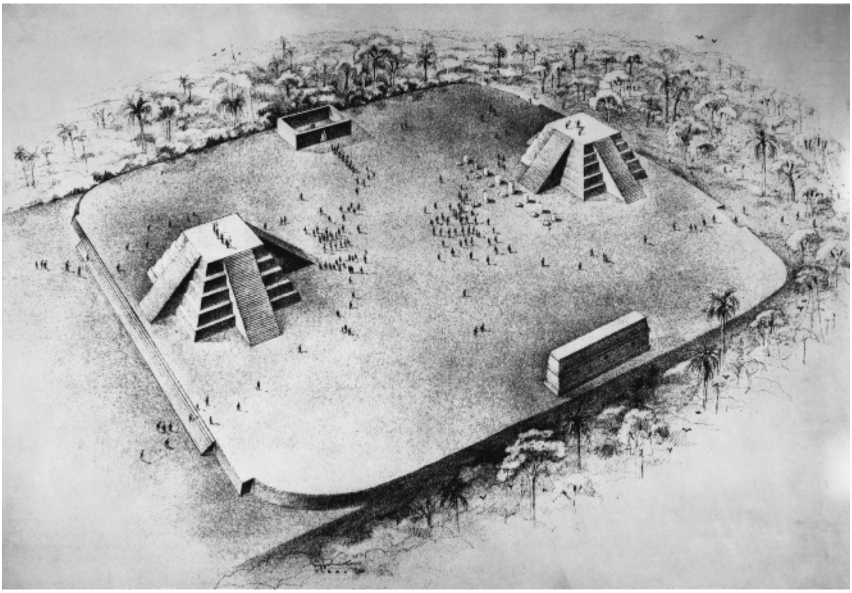

Figure 6.2. Tikal Twin Pyramid Complex, Group 4E-4. The complex is oriented to the cardinal directions with the twin pyramids oriented east and west. (Illustration by Norman Johnson. Courtesy of the Penn Museum, image #66-5-49.)

powerful political and ideological statements through the architecture of a city. East and west within a city spatially mark the path of the sun and the location of the rising and the setting of the sun as seen on the horizon. East and west are linked not only to the cycle of the sun but also to other natural sources of power such as the agricultural cycle (Aimers and Rice 2006). East and west locations are often marked by ritual structures that commemorate these significant natural cycles. North and south are associated with up and down. Along the sun's daily path, north (up) marks the sun's height at midday, associating north with the heavens and a position of supreme power. South (down) is associated with a worldly and underworldly position as the sun passes through the underworld at night. Across the Maya area, leaders of the largest Maya cities claimed the powerful north location for the construction of their residences to make a vivid and visual statement about their power.

We compare architectural layouts at Chan's Central Group and Tikal's Twin Pyramid Complex, Group 4E-4, to illustrate that at one of the smallest and one of the largest of Maya centers alike, site planners drew upon cosmological principles to make ideological and political statements (compare figures 6.1 and 6.2). Tikal's twin pyramid complexes are exemplary of the cosmological and directional principles that royalty deployed (Ashmore 1991; Ashmore and Sabloff 2002).

The east and west structures of Chan's Central Group and Tikal's Twin Pyramid Complex, Group 4E-4, are both pyramidal in shape and form an east-west temple complex. The south structure at Tikal Group 4E-4 is a nine-doorwayed vaulted range structure—the only structure along the plaza to have a vaulted roof. The number nine is associated with the underworld and the nine gods of the underworld (Ashmore 1991; Guillemin 1968). Ashmore and Sabloff (2002) demonstrate an association between south and worldly affairs, such as administration, ongoing in south-situated nonresidential architecture. The south structure of Chan's Central Group is likewise the only structure along the Central Group (and entire community) to have a vaulted roof. It is the center of worldly affairs at Chan, as it served as an administrative and adjudicative place for residents (Robin et al., ch. 7, this vol.). To the north at Tikal Group 4E-4 is an open roofed structure, which houses a stela portraying an image of a ruler. The north structure at Chan's Central Group is similarly used to visually place Chan's leaders in the powerful north position, as it is the location of the residence of Chan's leading family.

The point we draw from the Chan-Tikal comparison is that from one of the smallest Maya centers to one of the largest, similar directional principles and spatial layouts were used to define community centers and invest salient social meaning in spaces to define Maya places. When similar social ideals appear at small and large sites, archaeologists tend to argue that the small site is mimicking or emulating the ideas developed at the large site. But what the historical depth of the planning principles employed in the construction and reconstruction of Chan's community center and development of community ritual (discussed below) shows is that many of the ideas that later in time became part of a Maya noble and royal ideology and political strategy were in fact initially conceived by farmers in farming communities.

As discussed in chapter 2, the Central Group was the focus of Chan's settlement since the inception of the community in the Middle Preclassic period. At this time, residents oriented the Central Group to the cardinal directions, and this original orientation was adhered to by all subsequent community planners. The north point of the Central Group was marked by a cache (Latsch 2003) containing a single blue-green teardrop-shaped jade *adorno* (Keller 2008). This small piece of jade marked the center of the north residence, which was at that time a 25 cm high stone structure. While the north residence grew in size through time, ultimately rising to a height of 1.45 m, the position of the jade adorno remained the center point of the structure across its subsequent 2,000-year history.

Wendy Ashmore (1995; Ashmore and Sabloff 2002) further notes chronological shifts in the directional patterning of site planning at major Maya centers. Cities dominant in the Preclassic tend to have a stronger east–west architectural focus and cities dominant in the Classic tend to have a stronger north–south focus. She suggests that this reorienting of Maya cities represents shifts in understandings of political power as either largely seated in natural processes and agricultural cycles (a dominant east–west axis) or seated in the human cycles of royalty and their dynasties (a dominant north–south axis). At Chan we see this chronological shift from an east–west to a north–south axis occurring across temporal changes in construction at a single community. In the Middle Preclassic, architecture was only constructed on the north and south ends of the Central Group. By the Late Preclassic (350 BC–AD 100/150), architecture was constructed on all four sides of the Central Group and the first ritual architecture was constructed. The major phases of rebuilding activity on Chan's east and west ritual structures were in the Preclassic and Early Classic periods, whereas for the north residence and south administrative structure they were in the Late Classic period (Kosakowsky 2006, 2007, 2008, 2009). There was a shift in the focus of architectural construction from the east–west to the north–south axis in the Late Classic. Still, as measured by building height, the east–west axis remained the dominant architectural axis at Chan throughout its history. This may relate to the Preclassic founding of the community or to Chan's enduring agrarian focus.

A 2,000-Year History of Ritual

Chan's E-Group: The Development of Community Ritual in the Late Preclassic to Terminal Classic Periods (300 BC–AD 900)

Construction of Chan's E-Group began in the Late Preclassic period and continued through the late Late Classic period with its buildings being used into the Terminal Classic (Kosakowsky 2006, 2008). In the Late Preclassic period (350 BC–100/150 AD), on the east and west sides of the Central Group, residents constructed two stone structures. The east structure rose 80 cm and the west structure rose 50 cm. At this time, the east structure was a single, not a tripartite, structure. Still, an understanding of the tripartite nature of the east side of the plaza was inscribed in a nonarchitectural form onto that side of the plaza: an upright stone and a cache containing a Candelario Appliquéd *incensario* fragment, charcoal, and two pieces of worked *Strombus* detritus mark the location that would later become the north building of the east structure of the E-Group (Kestle 2004; Kosakowsky et al., ch. 15, this vol.). By the Terminal Preclassic period (AD 100/150–250), the E-Group had taken on its final form with a tripartite east structure and a single west structure.

The central east structure (Structure 5–center) consists of 48 fill and floor layers, 10 construction phases, and 14 subphases. Rising to a height of 5.6 m in the late Late Classic period, it is the tallest structure at Chan (figure 6.3; Meierhoff et al. 2004). The northern and southern east structures are not symmetrical, as the southern east structure is taller than the northern east structure. The northern east structure (Structure 5–north) consists of 14 fill and floor layers, four construction phases, and two subphases, ultimately reaching a height of 2.2 m (Kestle 2004). We carried out horizontal and vertical excavations on both the central and northern east structures, but due to heavy looting at the southern east structure (Structure 5–south), this structure was not excavated. The west structure of the E-Group (Structure 7) consists of 38 fill and floor layers and seven construction phases, ultimately reaching a height of 4.9 m (Kestle 2005). We conducted vertical excavations at the west structure, but excavations there were more limited than on the east structure due to looting activity.

Only the summit of the central east structure has a superstructure. Horizontal exposures of the ultimate- and penultimate-phase architecture of this superstructure identify that it had two tandem rooms, the rear of which had a bench. The superstructure had partial masonry walls that rose 50 cm in height. These would have remained open to the air or could have supported a perishable building (Meierhoff et al. 2004).

Ritual practitioners deposited a late Late Classic cache of a large unslipped censer stand in the step leading to the rear and upper room. Later they placed parts of incomplete vessels including incense burners, serving vessels, and jars on the floor of the front room (Kosakowsky 2006; Kosakowsky et al., ch. 15, this vol.). Excavation supervisor Jim Meierhoff noted round burned patches across the floors of the front room and postulated these to be the locations of the placement of incense burners during ritual events.

The traces of incense burners that once stood atop Chan's tallest temple, the caching of an incense burner, and the deposition of incense-burning

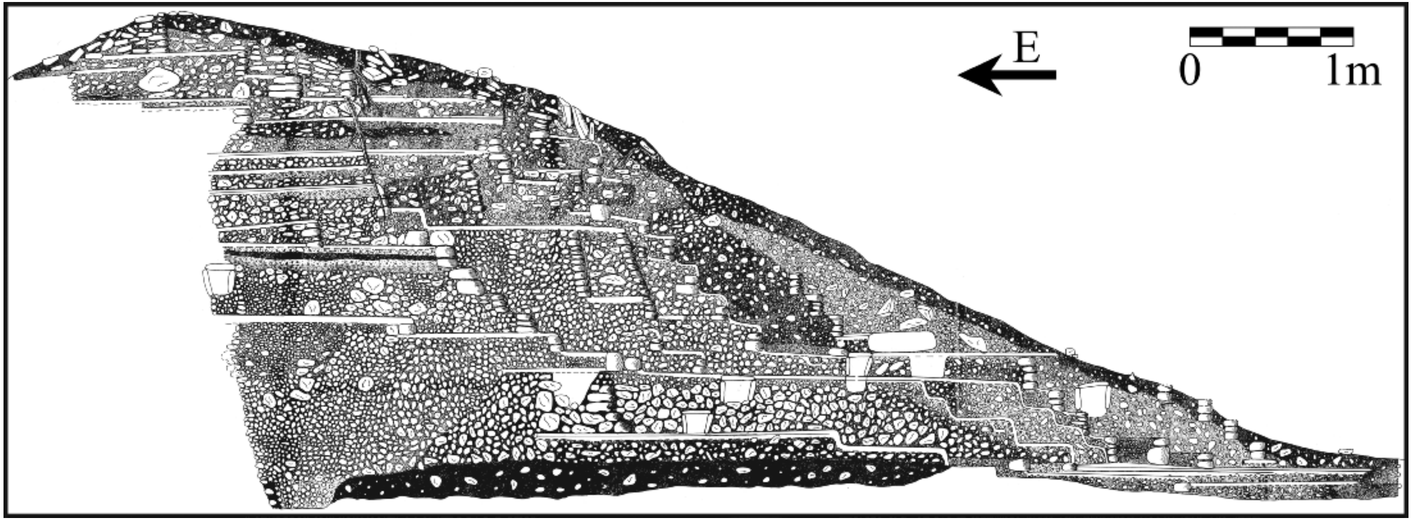

Figure 6.3. Profile of central east structure of E-Group (Structure 5–center). (Illustration by Nasario Puc.)

and food-bearing vessels across a room floor are the lines of evidence that allow us to build a picture of the ritual use of the E-Group. Burning of incense and the serving of food accompanied ritual events at the E-Group. The sight and smell of the incense rising from the ceremonial event would have been an integral part of the experience of those events.

Like other E-Groups, Chan's E-Group served as a shrine for a select group of ancestors from the community. Chan's residents interred their ancestors in both the east and west structures of the E-Group. We excavated 14 burials that house 20 individuals from the E-Group: 9 from the east structure (8 from Structure 5–center and 1 from Structure 5–north) and 5 from the west structure (Kestle 2004, 2005; Meierhoff et al. 2004). The burials in these structures date to between the Late Preclassic and late Late Classic periods (Kosakowsky 2006, 2008). As Anna Novotny's analysis in chapter 12 documents, adults and children and males and females were buried in the E-Group. Youth, a feature highly regarded in Classic Maya royal society, was a selection factor for ancestral burial. Selection of certain individuals from a community as ancestors is an integral part of ancestor veneration (McAnany 1995). The selection of young and middle adults for special burial is also found at Cuello (Robin 1989).

While the E-Group is a ritual architectural complex that is collectively dedicated to the veneration of select ancestors at Chan, there are differences between its east and west structures. The central east structure is not merely the tallest construction at Chan, but there was a greater investment in its renovation and rebuilding than in the west structure or the northern east structure, although the height of both of these was increased in the Late Classic period while that of the central east structure was not. These architectural distinctions point to the central east structure being the focal point of ritual activity for the E-Group. The focal nature of the east structure is not surprising, as east represents the position of the rising sun and is ideologically considered the dominant direction along the east–west axis.

The position of bodies in graves and ages of individuals interred also differs between the east and west structures of the E-Group (Novotny, ch. 12, this vol.). In terms of burial position, primary individuals in the east structure, where the position of the individual could be discerned, are all interred in an extended position with the head to the south. This is the most common burial position at sites throughout the Belize Valley, showing a strong cultural affiliation between the residents of Chan and regional Belize Valley–area residents. Although the burials in the west structure are poorly preserved, only one individual there is interred in the standard

Belize Valley position. One individual is interred in a flexed position with the head to the north and the cranium looking to the east (plausibly at the east structure). The other individuals are too poorly preserved to permit investigators to discern position or contain only cranial material, but in all cases the heads of these individuals are located at the north end of the grave (Kestle 2005). Interesting age differences between the individuals buried in the east and the west structures also occur: the only three children identified at Chan were all interred in the west structure of the E-Group. Although a more precise significance of the different patterns of ritual treatment of ancestors buried to the east and west in the E-Group is not discernable at this time, there is a clear association between east being the focal point of architectural and ritual activity at the E-Group involving young adult ancestors and traditional Belize Valley burial practices. West is associated with children and distinctive burial practices.

In chapter 12 Anna Novotny discusses five burials: Burials 1, 3, 5, 16, and 20, for which there is direct evidence for the reentry of ancestral graves. Additional evidence for grave reentry comes from Burial 8, the second burial to be interred in the central east structure in the Late Preclassic period. Burial 8 contains a single individual (Individual 8.1), a young adult male, aged 18 to 24. Individual 8.1 was interred with six ceramic vessels, a large and unique blade of honey-colored Northern Belize chert, and a small jade pendant. While the skull of this individual was in the anatomically correct position in relation to the body, the skull was disarticulated from the body and located inside a Sierra Red dish. The practice of placing skulls of ancestors in ceramic vessels, so they could be removed from the grave and processed around in ceremonies and communicated with about important matters is known from noble Maya iconography and burial practices of the Classic period (McAnany 1995). Placed inside a Sierra Red dish, the skull of Individual 8.1 could have been removed from the grave and incorporated into ritual performances or brought back to the world of the living for consultation on important issues. The specific treatment of burials in the E-Group and the burial of another individual, Middle Preclassic Individual 1.1 in the Central Plaza (discussed below), provide evidence that communicating with ancestors and incorporating them into contemporary ritual are a part of farmers' ideology dating back to the Middle Preclassic period.

An additional piece of evidence suggests that ritual practitioners reentered the graves of ancestors in the E-Group. Where floors were well preserved in the structures of the E-Group, excavators noted that the floors were not patched over graves. Traditional archaeological reasoning suggests that if a floor is patched above a grave, then the burial is contemporary with the use of the structure into which it was placed. Conversely, if a floor is not patched above a grave, then the burial is contemporary with the construction of the next architectural phase of the structure, as the living would not want to live with an opening in their floor.

Such traditional archaeological assumptions are false in the case of the burials at Chan's E-Group. Laura Kosakowsky's (2006, 2008) ceramic analysis of burial artifacts and associated architectural fill material illustrates that the E-Group burials are contemporary with the architecture into which they were placed rather than the architecture of the subsequent construction phase. Why were the openings to the graves of the ancestors not patched over after their burial? Ritual practitioners at Chan seem to have placed ancestors into the floors of the E-Group and not patched openings closed while the floors were still in use so they could continue to communicate with the ancestors and incorporate them into rituals even after their death. The openings in the floors allowed direct access points between the living and the dead.

Just as ritual practices differed between the east and west structures of the E-Group, the nature of ritual practices also changed through time. There is an intriguing trend in the deposition of grave goods in burials within the E-Group, noted during excavation and borne out by subsequent analyses. During the Preclassic period, burials were interred in the E-Group with a range of grave goods including ceramic vessels, figurines, incensario prongs, jade ornaments and pieces, shell ornaments and shell working detritus, obsidian blades, chert blades, stingray spines, quartz crystals, and hematite (Kosakowsky et al., ch. 15, this vol.). Ceramic vessels form a large part of Preclassic grave good assemblages. But by the Classic period, ceramics were no longer included as grave offerings. Also, as Anna Novotny notes (chapter 12), in general there is a decline in the number of grave goods interred with Classic as opposed to Preclassic period ancestor burials. Do these lines of evidence indicate a decline in the status of Chan's ancestors in the Classic period? Or do they tell us something about the changing nature of Classic and Preclassic period ancestor veneration?

Beginning in the Early Classic period and on into the Late and Terminal Classic periods, ceramics were interred in the E-Group only in caches and terminal deposits (Kosakowsky et al., ch. 15, this vol.). Thus, what we are seeing at Chan's E-Group is changing ideas about material offerings and the nature of ritual practices. Ceramics moved from being grave goods in burials to being offerings in caches and terminal deposits. Other material objects continued to be buried with the ancestors, although in lower quantities than in the Preclassic as they were incorporated into caches and terminal deposits as well. Through the placement of material offerings in caches and terminal deposits rather than with specific ancestors, the E-Group and community as a whole, rather than a specific ancestor, became the focus of ritual activity. Changes in Classic period rituals at the E-Group seem to represent a heightened focus on highlighting the community as a whole in ritual practices. Anna Novotny's osteological analysis (chapter 12) comparably shows that multiple interments are more common than single interments in the Classic period: two out of the five Classic period burials contain multiple individuals, while only one out of nine Preclassic period burials contain multiple individuals. Here again the specific individual became less the focus of the burial ritual as groups of individuals in a single grave became more common.

Marking the Community Center: Middle Preclassic to Early Postclassic (650 BC–AD 1150/1200)

While Chan's E-Group may be its most impressive architectural complex for the performance of ritual, there is one location at the site that might be considered more sacred if one measures sacred in terms of the length of time that a location is used in ritual practices. This location is the center of the Central Plaza—an area that was the focus of ritual practices from the Middle Preclassic to Early Postclassic periods (Kosakowsky 2007). As Bernadette Cap points out in chapter 8, the seeming emptiness of ancient Maya plazas today should not blind us to the vibrant array of activities that were conducted there in the past.

We initiated excavations in 2003 at the center of the Central Plaza—the geographical center point of the community—to attempt to locate evidence for community center ritual. We thought that this nonarchitectural space might be a location for ritual activities, based on evidence from contemporary Maya agrarian communities and ancient Maya civic centers. From contemporary ethnographies we knew that the social and spatial center of a farming community is often a place where people come together to consecrate community (for example, Hanks 1990; Vogt 1976). Research in plazas at larger Maya centers reveals evidence of plaza center ritual activity (for example, Awe 1992; Garber et al. 2004; Hammond 1991; Robin 1989; Welsh 1988; Wells 2003).

Chelsea Blackmore's (2003) excavations at the center of the Central Plaza revealed a 2,000-year sequence of ritual activity that marked this point as the center of the Chan community. Beginning in the Middle Preclassic period, caches and a single burial (Burial 1) were placed in small pits dug into bedrock at the center point of the Central Plaza. As caches were dug into one another through time, for the archaeologist, discerning the stratigraphic distinctions between one deposit and another was difficult. The ultimate form of the successive caching episodes appears to be a single large subcircular pit, although this pit actually consists of numerous small pits (figure 6.4). For the ancient residents of Chan, the act of successively placing caches in the Central Plaza that cut into previous caches would have invoked the memory of prior ritual events. The act of placing caches repeatedly in the same place created a record of the ritual activity consecrating that place, which was as visible to ancient ritual participants in the past as it is to archaeologists today.

Excavations bisected the area of Middle Preclassic caches and identified a single burial (Burial 1), four distinct caches, and a fifth "cache" that likely comprises multiple distinct caching episodes (Blackmore 2003). Cache offerings include fragments of serpentine and jade, shell beads and shell working detritus, a ceramic figurine fragment, a miniature unslipped square ceramic container, and quartz (Kosakowsky et al., ch. 15, this vol.). Green objects, either of serpentine or jade, are more common in ritual deposits in the Central Plaza than elsewhere at Chan. As Chelsea Blackmore (2003) notes, the color green is ritually associated with a notion of the center in Maya ideology (today and in the past), and Chan's residents used green objects in rituals to consecrate the center of their community. What we wish to point out here is not that people at Chan were drawing upon broader Maya belief systems but that the Middle Preclassic residents of Chan are among the ordinary people, like others across the Maya area, who through their ritual practices established what would become the highly conventionalized structures of ritual practices in later periods.

Many of the objects deposited in the Middle Preclassic burial and caches in the Central Plaza are partial objects: pieces of a larger serpentine or jade object, shell working detritus, or a fragment of a figurine. Cached shell beads in these deposits could be fragments of larger pieces of jewelry. Pieces of objects were deposited in the Central Plaza ritual deposits, and other pieces of those same objects remained in circulation in the living community. Angela Keller's (2008) analysis identifies that four fragments of the same jade object were successively interred in three different caches and as a grave good for Burial 1. The adjoining pieces of objects buried in

Figure 6.4. Caches and Burial 1 excavated into bedrock at the center of the Chan community. Note that what looks like a single large circular pit in the photo is a sequential series of ritual deposits dug into bedrock at the center of the community. Stone concentration in the northeast corner of excavations caps Burial 1. (Photograph by Chelsea Blackmore.)

ritual deposits that remain in circulation at Chan were curated, perhaps used in other rituals taking place at the Central Plaza or elsewhere in the community, and in some cases were interred in a subsequent Central Plaza ritual event. The part of the object that remained in circulation in the community referenced the buried part of that object and the earlier ritual event. By burying and curating partial objects, people linked themselves to their history and community.

Burial 1 contained a single individual (Individual 1.1), age 20–24 of unknown sex, who was buried in an extended supine position with the "head" (which had been removed) to the northeast. As Anna Novotny discusses in chapter 12, the grave of Burial 1 was reentered across the Middle Preclassic and Late Preclassic periods. Fragments of human bone, serpentine, jade, shell, and slate were deposited at each reentry. These objects are either objects originally placed with Individual 1.1 and removed and replaced during the reentries, or they are objects deposited at the time of the reentries to commemorate the visitation of the burial. Regardless, Individual 1.1 was revered through time with the most offerings of any ancestor or person buried at Chan. As the burial was reentered, body parts of this ancestor were removed from the grave and in some cases repositioned. The death and burial of Individual 1.1 was clearly remembered and revered for generations, and in fact centuries.

Caches continued to be placed in the Central Plaza in the subsequent Late Preclassic period, although during this time as the E-Group was constructed it became the focus of ritual activity. The Late Preclassic caches in the Central Plaza continued to reference and embody notions of the community center through their material form.

In the Terminal Preclassic, a cache of two lip-to-lip Pucte Brown or Balanza Black basal flange bowls was placed in the plaza area in front of the west structure of the E-Group. This cache contains a number of small jade, shell, slate, and chert items at the base of which are five small figures placed in a quincunx pattern (Keller, ch. 13, fig. 13.4, this vol.). The central figure is slate. Around this are a yellowish and reddish *Spondylus* figure, a green jade figure, and a white shell profile face. As Angela Keller discusses (in chapter 13), the arrangement of these objects in a quincunx pattern represents a Maya cosmogram and world axes and serves to sanctify the center of the community as the center of the world. What is particularly notable about this cache is the set of colors (green, yellow, red, black, and white) of objects associated with the quincunx. The placement of the black figure in the center, rather than the green figure, perhaps signifies the western location of this cache in the plaza, as west is associated with black.[1] This is the second cache identified at Chan in which green, yellow, red, black, and white objects were placed in a quincunx pattern. The other cache is a late Late Classic river cobble cache used to center and dedicate a humble farming house located at Chan Nòohol south of the Central Group (Robin 2002a). In the latter cache, residents placed river cobbles with yellow (south), red (east), black (west), and white (north) markings in the cardinal directions around a serpentine fragment. An intriguing aspect of these caches and their color symbolism is their dates, Terminal Preclassic and late Late Classic. While the association of green with the center is a common element of Maya ideology from the Preclassic period onward (for example, McAnany 2004a), the association of the colors white, yellow, red, and black with a quincunx and the directions north, south, east, and west is most standardized during the period of contemporary ethnographies (for example, Hanks 1990; Vogt 1976). Postclassic sources do note color-directional symbolism, but there is variation as to what colors go in what directions. Here again we see that

Figure 6.5. Early Postclassic shrine (Structure 1). The top of Stela 1 is located on the west edge of the shrine. (Photograph by Michael Latsch.)

the residents of Chan, from the humblest of farmers to community leaders, were some of the actors who through their specific ritual practices took part in creating what would become the highly conventionalized structures of ritual practices of much later times.

The late Late Classic period was the last period of major architectural construction on the buildings surrounding the Central Plaza. In the Terminal Classic period, only minor modifications of architecture, such as adding a step or raising the level of a floor, took place. The one new construction at the Central Group at the cusp of the Terminal Classic/Early Postclassic periods was the construction of a small, low square structure (Structure 1) measuring 2.6 m by 2.0 m with an elevation of 20 cm (figure 6.5; Blackmore 2003). This small shrine housed two superimposed mosaic altars (Altars 1 and 2) and is associated with a stela (Stela 1). It was constructed directly over the area of original Middle Preclassic caches and oriented to the intercardinal rather than cardinal directions, following the orientation of Middle Preclassic Burial 1.

By the Early Postclassic period, population had declined significantly at Chan and across the upper Belize Valley, but the importance of Chan's community center was commemorated. Two caches of Early Postclassic date that continued to consecrate the center of the community through their material form were placed on each of the two mosaic altars (Kosakowsky et al., ch. 15, this vol.), and the West Plaza was also in use (Cap, ch. 8, this vol.).

The two m high Stela 1 was not immediately recognizable as a stela. Upon excavation, a large cut stone fragment was identified on the top of the small central shrine. This cut stone fragment fit with other pieces of Stela 1 that were scattered across the Central Plaza. The standing stela is associated with the world tree that stands at the center of the Maya cosmos (Schele and Freidel 1990). By placing a stela at the center of the Central Plaza, Chan's latest residents were once again marking the center of their community as the center of their world. Bernadette Cap (chapter 8) identified another complete but fallen stela in the West Plaza (Stela 2), which likely marked an entrance to Chan's community center. Although we discuss in this chapter how much of the ritual practices at Chan were not cases of farmers emulating the ideas of Maya nobility, the presence of these late stelae at Chan seems evidence of Chan's leaders emulating and appropriating the symbols of the most divine of Classic Maya kings. Stelae are the quintessential marker of the ritual and political power of the Maya kings and are widely found across Maya centers as early as the Late Preclassic period (Hammond 1982). Stelae entered into Chan's ritual assemblage only late in its history and well after their salient meaning was established by noble actors across Maya society. From the dates and inscriptions on carved stelae at larger Maya centers, we know that in the Early Classic carved stelae had a restricted distribution. They were restricted to the largest centers and were erected only by the highest levels of royalty. As the power and authority of the Classic Maya kings waned at the end of the Classic period, carved stelae became more widely distributed at smaller royal seats of power and were erected by more inclusive groups of lesser royalty and nobility (for example, Martin and Grube 2000). Chan's two late uncarved stelae seem to represent the furthest extension of this process of appropriation and emulation as even smaller nonroyal centers were able to usurp the original symbols of the kings for their own purposes.

Stela 1 did not break on its own. It was intentionally cut into pieces and scattered across the plaza. Elsewhere, intentionally broken stelae are interpreted as the result of warfare, violent events, or the rejection of the ideology of particular rulers (Brown and Stanton 2003). As there is no evidence of warfare at Chan, possibly Stela 1 was destroyed in rejection of the ideology of the kings that it represented. But Stela 2 in the West Plaza was not dismantled and scattered. Cutting apart and scattering Stela 1 may reference the long history of breaking and burying parts of objects in the Central Plaza. It may have been a final act of consecrating community. Certainly the two interpretations for its breakage are not mutually exclusive.

Conclusions

The 2,000-year history of a small Maya center is an instructive history in terms of understanding the rituals and worldviews of Maya farmers and the development of a Maya religion more generally. In terms of religious practices—long given a privileged role in noble society and intellectual innovation—Chan's history shows us that complex religious knowledge was initially developed in farmers' community centers and homes and then later appropriated by society's nobility. At Chan, venerating a select group of ancestors and reentering their graves to involve them in contemporary rituals and possibly decision making has a deep history going back to the Middle Preclassic period. The ritual activities at the center of the Central Plaza, from caches and burials to altars and a stela, all materially represent ideas about the meaning and importance of the center and its color, divinity, and cosmological associations. Chan's architects planned and organized the Central Group around the cardinal directions to make visible statements about power and ideology. From noble Maya art, iconography, and hieroglyphs we know that all of these practices are key aspects of later Classic period state religion and city planning. But here at Chan we are seeing people formulate complex sets of ritual knowledge through material objects dating back to the Middle Preclassic period. What we see at Chan is the local construction of a popular religion, only later appropriated by nobility into state-level religious practices.

As archaeologists, we can understand the development and range of ritual knowledge of Chan's residents precisely because they constructed ritual spaces and events in materially visible ways—visible to them and thus visible to us. After our three years of excavations at Chan's Central Group, our entire team became profoundly aware of the enduring meaning of the center of the Chan community. When we reburied the Chan site after our excavations were complete, Belizean foreman Everaldo Chi, on behalf of the excavation team, asked if the broken Stela 1 could remain reassembled in the center of the Central Plaza to mark the importance of that place. Similarly, excavations in the central east structure of the E-Group uncovered an altar (Altar 3) carved out of a single piece of stone. Everaldo Chi likewise asked if rather than reinterring that altar we could leave it exposed so contemporary residents could "see" the importance of Chan's 5.6 m high structure. With our archaeological work once again the material record of ritual at Chan was reentered, remembered, and reformulated. Excavation supervisor Caleb Kestle made a replica of a Postclassic spiked incense burner and left it on the exposed altar after our final season of excavation. When we returned two years later, we discovered that modern residents had used the incense burner and altar. We found the remains of burned incense in the incense burner and a book on the altar. The book could not be opened or read, because it had been repeatedly rained upon since the time of its deposition. Again, modern residents in the vicinity of Chan are reentering a place of ancient ritual significance and reformulating a new type of ritual knowledge that leaves us with new material traces.

Note

1. The precise cardinal directional orientation of the four figures surrounding the central slate figure is unknown because the lip-to-lip cache vessels containing this cache were quite fragmentary. To preserve the vessels and materials they contained, they were removed from the field still encased in soil matrix. They were then carefully excavated in the controlled laboratory environment. It was during this excavation that the interior cache was identified.

7

Nonroyal Governance at Chan's Community Center

CYNTHIA ROBIN, JAMES MEIERHOFF, AND LAURA J. KOSAKOWSKY

Identifying the highest-status residents of a site or region has long been a hallmark of archaeological research. Structure size, access to luxury and long-distance trade items, and burial elaboration are the material signatures that allow archaeologists to identify high-status individuals. But identifying the material signatures of high status is just the beginning, rather than the endpoint in an analysis of power, prestige, and leadership. As Arlen and Diane Chase (1992) note in terms of definitions of Mesoamerican elites, the term *elite* combines two characteristics: those with wealth, status, and privilege in society and those who manage society's institutions (also see G. Marcus 1983). In this chapter we are particularly interested in defining the nature of community leadership at Chan. Evidence for community-wide festivals and feasts illustrates one of the mechanisms through which leaders brought the community together to build community. The unusually well preserved architecture and unique array of terminal deposits in the rooms of the southern range structure (Structure 6) at the Central Group provide a rare glimpse into the nature of community administration and adjudication in a farming community.

The obvious nature of temples from large to small Maya sites has led to a great deal of interest in Maya ceremonialism, which has demonstrated the importance of ritual in Maya political process (see chapter 6). But how did leaders use ceremonies and other means to govern their communities? The study of kingship and dynastic rule has a long history in Maya archaeology and iconographic studies dating back to the pioneering work of Tatiana Proskouriakoff (1960), but even for Maya royalty there has been less discussion of the human relationships and functions that constitute the governance of a site or community (Inomata and Houston 2001; Schele and Miller 1986). In terms of understanding royal governance of large Maya civic-centers, Takeshi Inomata and Stephen Houston (2001) have encouraged scholars to look at the people and the range of activities and interactions ongoing in Maya royal courts—the complexes in which Maya royals lived and governed. This chapter explores Chan's community center as an area in which farming community leaders lived and governed.

We focus on the excavations of Chan's leading family residences located at Structure 2, the northern structure in the Central Group (Latsch 2003), and at residential groups C-002 and C-003, located adjacent to and east of the Central Group (figure 7.1; Meierhoff and Baktash 2006). Two ancillary structures (Structures 3 and 4) in the Central Group adjacent to and west of leading family residence Structure 2 provide additional insight into the livelihoods of Chan's leaders (Latsch 2004). Excavations of the southern range structure, Structure 6, reveal an *audiencia*-style building from which Chan's leaders governed and settled disputes (Meierhoff and Miller 2005).

Locating and Defining Chan's Leaders

At Chan the location of its highest-status residences was initially proposed based on settlement survey data and the identification of the largest structures clustered at the center of the community (see figure 1.2). As discussed in chapter 6, the size and northern location of Structure 2 in the Central Group and its two associated ancillary structures, Structures 3 and 4, suggest that Structure 2 was the residence of Chan's leading family. East of and adjacent to the Central Group are two of the largest residential groups at Chan, C-002 (a type 6 group) and C-003 (a type 5 group; see figure 7.1). Based on their size and central location they were proposed to be the residential areas of the extended families of Chan's leaders. Subsequent excavation and analysis of material remains identify that the residents of Structure 2 in the Central Group and of groups C-002 and C-003 not only lived in the largest and centrally located residences at Chan but also had unique access to elaborate funerary rituals (Novotny, ch. 12, this vol.) and certain luxury goods (Meierhoff et al., ch. 14, this vol.) and were involved in the production of nonlocal luxury items (Keller, ch. 13, this vol.). We identify the residents of Structure 2 in the Central Group and of groups C-002 and C-003 as Chan's leaders not only because they were the highest-status residents but also because they orchestrated community-level ceremonies (ch. 6, this vol.), held large-scale feasts (ch. 13, this vol.), and presided over the administrative and adjudicative functions of the site (discussed below).

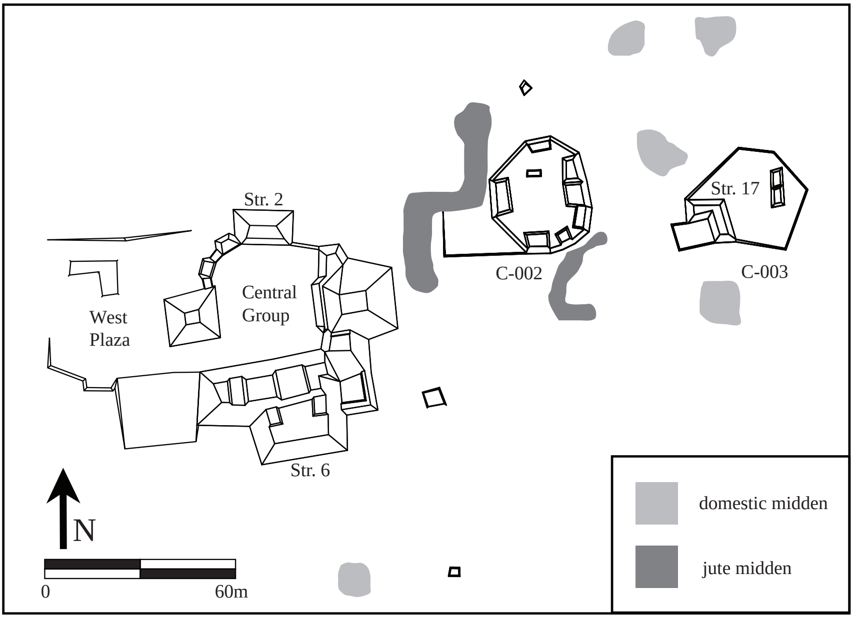

Figure 7.1. Chan's community center and adjacent leading family residences. Structures marked on figure include Structure 2 in the Central Group, the leading family residence; Structure 6 in the Central Group, the administrative building; and groups C-002 and C-003, the residences of the extended families of Chan's leaders.

Identifying the Material Nature of High Status at Chan

Comparing nonlocal luxury items such as jade, shell, and obsidian at residences across the community shows that Chan's leaders and their extended families had quantitatively more of these items than other residents, but they did not have qualitatively different luxury items (see Blackmore, ch. 9, this vol.; Keller, ch. 13, this vol.; Meierhoff et al., ch. 14, this vol.). They were the only residents who had access to non-Guatemalan obsidian from Mexico and Honduras (Meierhoff et al., ch. 14, this vol.). While the quantity of luxury items that they possessed indicates their high status, the comparability of the types of luxury items possessed by all of Chan's residents suggests a heterarchical arrangement of difference in terms of access to luxury goods. In Angela Keller's words, "What they had, they gave" (ch. 13, this vol.).

Although Structure 2 in the Central Group and the residences of C-002 and C-003 were among Chan's largest residences, with stone basal structures measuring over one meter high, perishable houses with thatch roofs surmounted these structures. Only one residence, Structure 17, had low (50 cm high) masonry foundation walls that supported full perishable walls. Chan's leaders, like other residents at Chan, lived in perishable houses.

Structure 2 in the Central Group is the most completely excavated of Chan's leading family residences. In its final, late Late Classic form, Structure 2 measured 16.20 m (E–W) by 9.8 m (N–S) by 1.45 m in height. It was a bilevel structure with a front axial stairway and a low (20 cm high) masonry bench at its summit (Latsch 2003). Each reconstruction of Structure 2 was centered upon and superimposed above the previous structure. Below the first Middle Preclassic stone structure, two post holes were identified that may indicate the presence of an earlier building made completely of perishable materials.

Unlike the E-Group, which had its major construction periods during the Preclassic and Early Classic, Structure 2, like the south Structure 6, had its major construction in the Late Classic. By the early Late Classic period, Structure 2 was 55 cm high, and the bulk of its expansion occurred in the late Late Classic period.

Adjacent to Structure 2 are two low ancillary structures, Structures 3 and 4. In the late Late Classic period, Structure 3 measured 4.4 m (N–S) by 8.5 m (E–W) by 65 cm in height and Structure 4 measured 70 cm in height (its full areal extent was not exposed; Latsch 2004). Despite the relatively small size of these structures compared to other constructions at the Central Group, higher quantities of ceramics were identified on the surface of Structures 3 and 4 than any other structure (Latsch 2003). Laura Kosakowsky's ceramic analysis (personal communication, 2010) also identifies greater amounts of ceramics in Structure 3 and 4 fills than from other structures in the Central Group. The higher quantities of ceramics at these ancillary structures suggests that at least one function of these buildings was the preparation of food—meals for the leading family and perhaps festival foods for the feasts that would have accompanied the ceremonies that the leading families hosted in the Central Group.

Craft production was also another likely function of Structures 3 and 4. Obsidian debitage related to core maintenance activities suggesting low-intensity pressure blade production was identified in a fill episode in Structure 3 dating to the Early Classic period and a fill episode in Structure 4 dating to the Late Preclassic period (Hearth 2008; Kosakowsky 2009). Structures 3 and 4 are the only places where obsidian blade production was identified at Chan. This suggests that the members of Chan's leading family either possessed the skills for obsidian blade production or associated themselves with attached specialists or itinerant specialists who may have worked at these ancillary structures (Hearth 2008; Meierhoff et al., ch. 14, this vol.).

Angela Keller (ch. 13, this vol.) also identified that Chan's leading families were involved in small-scale *Strombus* shell ornament production in the Middle to Terminal Preclassic periods. The marine shell working detritus from this production was identified in fill episodes in Structure 2, Structure 3, Structure 7, the Central Plaza, and Structure 8 in the West Plaza. Craft production of nonlocal items has only been identified associated with the leading family residences at Chan, and this craft production has a deep history going back to the Middle Preclassic period.

The Use of Space

Although there are clear distinctions between Chan's leading families and other families living at Chan, there also are core similarities in how families across Chan organized their domestic spaces. An important facet of our investigations across the Chan community was the exploration of the seemingly empty spaces around architectural groups. These spaces only appear empty today because they are devoid of architecture, but they were significant locations for a range of outdoor activities in the past (Robin 2002a). To explore the use of space around the Central Group and residential groups C-002 and C-003, investigators excavated post holes at 5 m intervals extending 50 m in all directions from the Central Group and 30 m in all directions from C-002 and C-003. Artifacts, stone, and soil samples for chemical testing were collected from each post hole.

Previous "vacant terrain" research at small type 1 and 2 farming households at Chan illustrated that small residential structures at Chan were located in the centers of "house-lots" that contained not only structures but also work spaces, entryways, gardens, and refuse deposits (ch. 1, this vol.; Robin 1999, 2002a, 2006). These house-lots extend roughly 25 meters from the domestic structures at their core. Chelsea Blackmore in chapter 9 identifies a similar house-lot pattern at midlevel households in the Northeast Group.

Artifact distributions around leading family residential groups C-002 and C-003 also follow a "house-lot" pattern, as a ring of refuse is apparent at roughly 25 m from these residential groups (see figure 7.1). Most of these refuse deposits date to the late Late Classic to Terminal Classic periods (Kosakowsky 2008). But one unique refuse deposit, located between the

Central Group and residential group C-002, contains an enormous concentration of *jutes* (the common river snail), which were consumed during the Late to Terminal Preclassic period and redeposited in this location in the late Late Classic period (Kosakowsky 2007; Keller, ch. 13, this vol.). From the smallest farming households to the households of Chan's leaders, families organized their domestic spaces as house-lots with houses surrounded by extramural work spaces. Garbage was deposited at the edge of lots demarking the living space of a house-lot. Comparable house-lot patterning has now been identified archaeologically at sites throughout the Maya area, such as Chau Hiix in Belize and Chunchucmil in Mexico (Goldsmith 2006; Hutson 2004).

The only architectural group at Chan that is not surrounded by a house-lot is the Central Group (see figure 7.1). The area around the Central Group is largely clear of artifacts. No middens were identified in extramural space by our posthole testing, and no extramural middens were identified during our excavations. The Central Group is not merely unique at Chan as its only type 7 architectural group, it is also unique in terms of the way extramural space was used. The extramural space around the Central Group was meticulously cleaned. There is a contrast between cleaned exterior spaces surrounding the most public of places at Chan, the Central Group, and the refuse deposits and work spaces of domestic life that constitute domestic house-lot exterior spaces. Late Late Classic and Terminal Classic refuse was identified at the Central Group, but there refuse was disposed of to fill in unused areas of architectural space, such as a passageway, rear doorway, or corner that was no longer in use.

In terms of interior spaces, there is also a distinction between how residential structures and ritual structures were used. Plaster samples were collected at 50 cm intervals across all preserved plaster floors at Chan. Chris Hetrick (2007) analyzed these samples to determine concentrations of phosphorus, an element highly indicative of human activity, using the Mehlich II extraction procedure adapted for Maya-area research by Richard Terry and colleagues (2000).

Phosphorus concentrations are relatively high across two adjacent room floors of the leading family residence, Structure 17, at C-003 that date to the late Late Classic period (figure 7.2). The highest phosphorus concentrations occur in room corners and doorways. This patterning suggests heavy utilization of these rooms and a cleaning pattern in which residents swept their rooms clean, finally sweeping debris out the door (Hetrick 2007). Sweeping would leave the most debris in room corners in areas that would be less

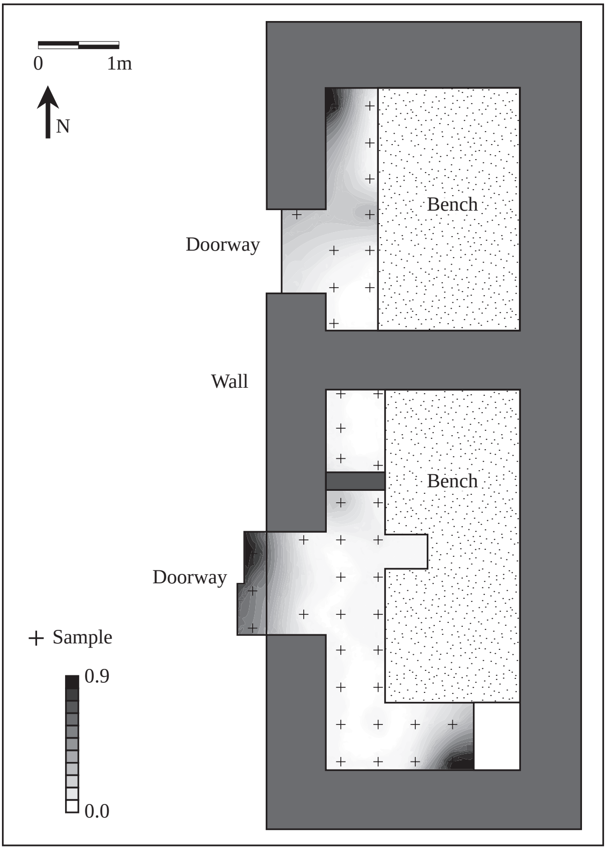

Figure 7.2. Phosphorus concentrations across room floors of leading family residence Structure 17 in C-003. (Illustration by Chris Hetrick.)

accessible to brooms and sweepers. Scott Hutson and Richard Terry (2006) identify a comparable spatial patterning of phosphorus concentrations on residence floors at Chunchucmil in Mexico.

In contrast, phosphorus concentrations are lower across a late Late Classic floor from Structure 5–center (the east building of Chan's E-Group; figure 7.3). The highest concentrations of phosphorus on this temple floor are found not in room corners but in the center of the floor in localized areas across the central part of the floor (Hetrick 2007). This analysis fits nicely with the observation that excavator Jim Meierhoff made upon excavating Structure 5–center that round burned patches occurred across the temple floors, which he postulated might be from the placement of incense burners (Meierhoff et al. 2004; ch. 6, this vol.). As incense burners would burn organic materials, these would also leave elevated phosphorus signatures across the floors.

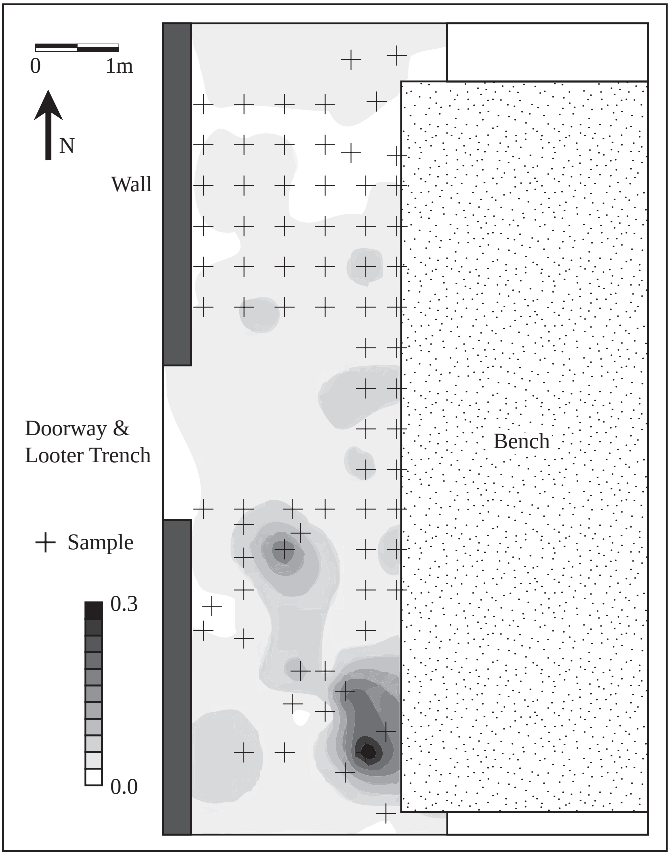

Figure 7.3. Phosphorus concentrations across the floor of the central east structure of the E-Group. (Illustration by Chris Hetrick.)

How the Leaders Led

Festivals, Feasting, and Leadership

As Bernadette Cap discusses in chapter 8, the large open spaces of Chan's Central Group and West Plaza were places where Chan's leaders sponsored events to integrate the community and legitimate their authority (also see Inomata 2006). Chapter 6 establishes the nature and symbolism of ritual deposits that were buried as part of the sacred events at the Central Group and served to consecrate the Chan community. But who attended these events? Were the attendees members of a few high-ranking families at Chan or were a broad spectrum of Chan's residents in attendance? Answering this question helps us identify how leaders used ritual to consolidate community.

Inomata (2006, following Moore 1996) estimates that participants attending events in Maya plazas would require between 0.46 m^2/person and 3.6 m^2/person of plaza space. The lower number corresponds to a tightly packed event and the higher number corresponds to an event in which participants had more space to move around. Using these numbers to gauge a minimum and maximum number of people that could participate in events in Chan's plazas in the late Late Classic period suggests that between 321 and 2,509 persons could have attended an event within the 1,154 m^2 Central Plaza and between 536 and 4,191 persons could have attended an event within the 1,928 m^2 West Plaza (including people standing along its broad south stair; see Cap, ch. 8, this vol.). A large festival that took place across Chan's civic-ceremonial plazas could have been attended by between 857 and 6,700 people. The larger of these numbers is significantly more than the number of residents at Chan at its population peak in the late Late Classic period, and the smaller of these numbers would have still included a broad spectrum of residents from across the community (see chapter 2 for population estimates). Ritual events sponsored by Chan's leaders at its community center can correctly be referred to as community-wide festivals that involved the broad membership of the community. Inomata (2006: 811–14) has found that at small royal centers such as Aguateca, all residents of a community could have attended events in its central plazas, but at the largest of Maya ceremonial centers, such as Tikal, it was not possible for the entire population to come together for an event.

The simultaneous presence of the entire Chan community for community-wide festivals furthers our understanding of the power of these events in building community. Festivals were times when community members came into face-to-face contact with each other. Residents experienced together the convening with ancestors, the burning of incense, and the deposition of sacred objects that consecrated community. All of this would have given a physical and experiential reality to the Chan community.

But as Bernadette Cap points out in chapter 8, this does not imply that community-wide rituals were devoid of division and competition. Social differences between community members would have been as visible at these events as the shared community concept that was being constructed. Divisions within the community may have been further marked by the distinction between who could view events from within the Central Group versus West Plaza. As well, hidden in the crowded space of a public event in Chan's central plazas, a resident could find the privacy to voice concern or dissent (see Scott 1990).

Two lines of evidence suggest that Chan's leaders hosted feasts as part of their community building festivals: (1) the larger quantities of ceramics from ancillary Structures 3 and 4, and (2) the deposition of an enormous amount of jutes between the Central Group and leading family residence C-002. As Angela Keller discusses in chapter 13, the "jute midden" contained 46,000 jutes per m^3, roughly 2.7 million jutes. Using Healy and colleagues' (1990) nutritional data, she estimates that the Chan jute midden contains roughly 23,000 meals of 500 calories each, or possibly the remains of 115 gatherings of 200 people—this would include the majority of Chan's residents in the Late to Terminal Preclassic periods when the jutes were consumed. The sharing of food was another means through which Chan's leaders built community and asserted their authority.

Administration and Adjudication: Evidence from Structure 6

As salient and prominent in residents' memories as the festivals in Chan's Central Group and West Plaza were for creating community, these events happened only occasionally; thus, they do not tell us how leaders led on a day-to-day basis administering over the community and settling disputes. The unusually well preserved architecture and unique array of terminal deposits in the rooms of the southern range structure, Structure 6, at the Central Group provide a rare glimpse into the nature of community administration and adjudication at Chan.

Structure 6 is the only vaulted masonry building at Chan. It consists of two buildings, Structure 6–east and Structure 6–west, that were connected by a vaulted passageway and interior stair. The smaller of the two buildings, Structure 6–west, was heavily looted, thus only salvage excavations were conducted there. The form of Structure 6–west is comparable to but smaller in scale than that of Structure 6–east. In its final late Late Classic form, Structure 6–east had 12 vaulted rooms (figure 7.4). Ten rooms formed part of a tandem-layout *audiencia* range structure with north, south, and interior doorways (Harrison's type 2 range structure [1970: 100]). The south doorways opened to a rear patio bounded by two rooms to the east and west. Ten of the 12 rooms were excavated. Each room contained a substantial bench, which took up at least half of the room and was elevated to a height of 60 cm. A *patolli* board was inscribed in the floors of Rooms 2 and 5, and horizontal and vertical lines, often called "graffiti" in the Maya area, were carved into the south wall of Room 2 (Meierhoff and Miller 2005).

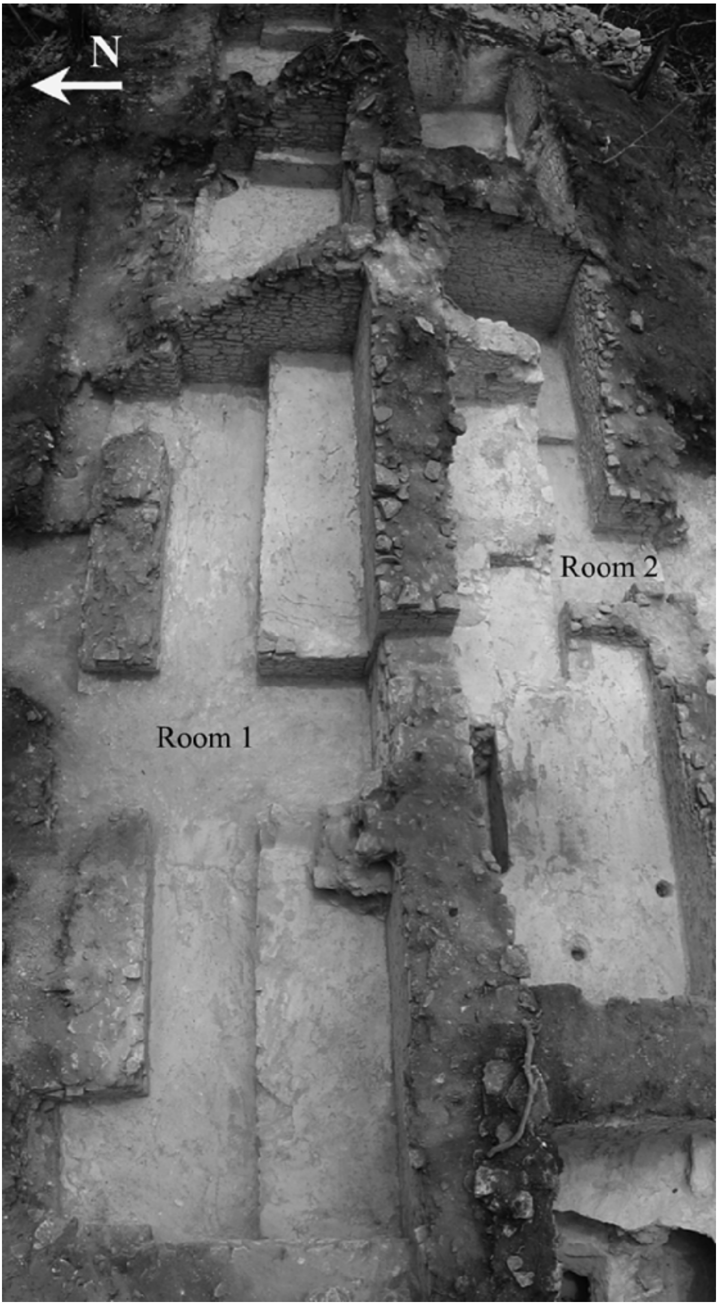

Figure 7.4. Central rooms of Chan's *audiencia*. Two of five quincunx holes in the west section of Room 2 are visible in the photo. (Photograph by James Meierhoff.)

Like the northern leading family residence (Structure 2), Structure 6 had its major period of architectural expansion in the Late Classic—the renovation of Structure 6 into a vaulted masonry building occurred completely in the late Late Classic period (Kosakowsky 2008).

A highly variable group of vaulted masonry range structures in the Maya area have long been identified as "palaces" (for example, Satterthwaite 1943). But as Takeshi Inomata and Stephen Houston (2001) note, there has been little attention to identifying what might have gone on in a palace. These buildings are commonly assumed to be residences or administrative buildings or some combination of the two. The first question we asked about Structure 6 at Chan was is it residential? The answer to this question has profound implications for our understanding of the social and political structure at Chan. If Structure 6 was the residence of Chan's leading family, this would mean that one family lived in a residence of unparalleled size, scale, and elaboration in the community, implying a profound degree of social stratification that would have its most appropriate social parallels in the European manor estates, North American plantations, or Latin American haciendas. If Structure 6 was not the residence of Chan's leading family, then Chan's leaders lived in perishable houses, similar to but larger than those of other community members. If Structure 6 was a community building, then all major architectural construction projects at Chan—Structure 6 and the E-Group—were devoted to the construction of community architecture rather than architecture for individual families.

Several lines of evidence suggest that Structure 6 did not have a residential function. First, there is a distinctive pattern of phosphorus concentrations across its room floors that differs from both the residential and ritual pattern discussed above. Two hundred fifty-four plaster floor samples were collected at 50 cm intervals across five rooms in the audiencia. Ninety-three percent (237) contained no traces of phosphorus, and the 17 samples that did contain phosphorus had only relatively low amounts of phosphorus. There is no evidence, in terms of phosphorus residues, of the types of domestic activities on the room floors of Structure 6 as is found in residential structures at Chan and across the Maya area (and indeed in contemporary and archaeological cases around the world; see Middleton 1998 for cross-cultural and cross-temporal examples). As well, plant use in Structure 6 differed from plant use in domestic and ceremonial contexts (Lentz et al., ch. 5, this vol.).

Second, the terminal deposits found across room floors in Structure 6 were distinctive in character: they differed room by room, and they differed from terminal deposits in residential and ritual structures (Kosakowsky et al., ch. 15, this vol.). Whereas terminal deposits from residential and ritual structures largely contain serving vessels and incense burners, terminal deposits from Structure 6 contain jars and unique items such as piles of jutes, spindle whorls, and deer antler. The significance of these unusual terminal deposits is discussed below, but here the contrast between these deposits and those on residential and ritual structures suffices to illustrate that Structure 6 was different than other structures at Chan.

To illustrate how Structure 6 functioned in the governance of the Chan community in this chapter, we highlight its two central rooms (figure 7.4; Meierhoff and Miller 2005). The central front Room 1 and rear Room 2 are the two largest rooms in Structure 6 and are joined by a doorway that was partly filled in at some point in the history of the rooms' use. The central front Room 1 is a broad room that measures 3.8 m by 0.9 m in its interior dimension and has three front doorways opening onto two long benches. No terminal deposit artifacts were found in Room 1.

In form, Room 1 is similar to an audiencia—a place where Chan's leaders could have held meetings and settled disputes. Benches in other smaller rooms in Structure 6 may likewise have served as meeting places for smaller groups of people. Benches are found in all of Chan's residential structures, but residential benches are low constructions rising no more than 10 or 20 cm above a floor's surface; only in Structure 17 were benches the size of Structure 6's benches identified in a residential structure. All of Structure 6's benches are substantial constructions rising 60 cm above room floors.

Room 1 of Structure 6 is comparable to Structures 3 and 13 at Cerén, which Andrea Gerstle (2002) identifies as Cerén's civic complex. No discernable residential functions were identified for Cerén's Structures 3 and 13. Structure 3 is the largest building at Cerén, and both structures represent unique constructions at the site, as puddled or rammed earth was the predominant construction technique. Both structures had large benches in their front rooms and had few associated artifacts.

The central rear Room 2 of Structure 6, like Room 1, measures 3.8 m by 0.9 m in its interior dimension, but Room 2 is unique, in that it is the only one of Structure 6's rooms to have internal divisions. Room 2 is part of the original L-shaped vaulted masonry building constructed in this location that also includes Rooms 3 and 10. Three narrow interior masonry walls, or screens, divide the space of Room 2 into three areas. The levels of the floors and benches in each of the three subdivisions differed in height. Multiple interior dividing walls and differing floor and bench elevations made it more physically complex to move around Room 2.

The west division of Room 2 has the highest floor and bench elevations and consists almost entirely of a raised bench area. Five holes forming a quincunx pattern were cut into this bench. Also a patolli board was carved into the bench floor, and horizontal and vertical lines were carved into the south wall of Room 2 in this area. Patolli boards are part of a game that could be used in divination (Connell 2000).

The central division of Room 2 has the lowest floor elevation and a bench. A terminal deposit located on this bench consists of a pile of 548 jutes covering a spindle whorl, and adjacent to this was pedestal base from a Roaring Creek Red vessel reworked as a cord holder (Kosakowsky et al., ch. 15, this vol.).

The east division of Room 2 has floors with two different elevations and no bench. A cache containing six deer antler fragments and two chert bifaces, one broken and one whole, was interred within the north floor in the east division of Room 2.

Although terminal deposits are found elsewhere in Structure 6 and at Chan, at the end of its use life Room 2 was covered with a lens of fine *sascab*, suggesting that particularly special care and attention was taken at the end of its use life to "bury" this room.

Comparing the unique architecture and deposits in Room 2 at Structure 6 to Cerén's divination structure (Structure 12) suggests that Room 2 at Structure 6 was used by a diviner who would have worked along with those meeting in the adjoining front Room 1 to settle disputes and resolve issues at Chan. Just as Room 2 of Structure 6 is divided into three areas, Structure 12 at Cerén is divided into three rooms. Scott Simmons and Payson Sheets (2002) liken this unusual tripartite division to a representation of the three levels of the Maya world: the earth, sky, and underworld. The five quincunx holes and the patolli board in Room 2 of Structure 6 represent another division of the Maya world into the four cardinal directions plus the center.

Cerén's Structure 12, like Room 2 of Structure 6 at Chan, is one of the most architecturally complex constructions at the site with numerous interior walls, steps, and changing floor elevations that made physical movement more complex than within other structures. Simmons and Sheets (2002) further suggest that narrow passageways and changing floor levels made the space feel like a cave, a key spiritual place in Maya sacred geography. The artifacts found in Structure 12 at Cerén constitute one of the most unusual collection of objects found anywhere at Cerén. Deer antler found in Cerén's Structure 12 and Chan's Room 2 of Structure 6 may have been part of a diviner's toolkit, as the deer has important ritual association in Maya beliefs and divination (Simmons and Sheets 2002). In Cerén's Structure 12, two piles of beans were found on a floor, which Linda Brown (1997) likens to the beans that modern Maya shamans use in divination and curing ceremonies. The jute pile in Chan's Structure 6, Room 2, may have served a similar divination purpose. Angela Keller's (chapter 13) analysis of the jute assemblage at Chan indicates that jutes not only were a source of food but also held important ritual meaning for Chan's residents. Linda Brown (personal communication in Simmons and Sheets 2002) also notes that seashells may be collected by modern shamans as "*cuentecitos*"—objects used to access supernatural power. The jutes in Room 2 of Structure 6 may have served a similar function for Chan's diviner.

The diviner working in Structure 6, Room 2, could have communicated with the leaders who were meeting in Structure 6, Room 1, through the doorway that connected the two rooms. Divination was directly tied to resolving issues of community interest and settling disputes.

Conclusion

The high status of Chan's leaders who lived at Structure 2 in the Central Group and adjacent residential groups C-002 and C-003 is defined by the size and centrality of their residences, their unique access to elaborate funerary rituals (Novotny, ch. 12, this vol.) and certain non-Maya luxury goods (Meierhoff et al., ch. 14, this vol.), and their involvement in the production of nonlocal luxury items (Keller, ch. 12, this vol.). Although there were clear differences between Chan's leaders and other community members, there is no evidence of an extreme system of social stratification at Chan. Leaders, like other residents, lived in perishable houses located at the center of house-lots. While they had quantitatively more luxury items than other residents, they did not have a qualitatively different range of luxury items, with the exception of non-Guatemalan obsidian (Keller, ch. 13, this vol.; Meierhoff et al., ch. 14, this vol.).

Chan's leaders governed the community through the orchestration of community-level ceremonies that brought all residents together to build community. They hosted large-scale feasts, and on a day-to-day basis they presided over the administrative and adjudicative functions of the site.

While Inomata and Houston (2001) note that the archaeological evidence for how Maya royals governed their cities is sparse, archaeological evidence for how the nonroyal leaders of farming communities administered and resolved disputes in their communities is even scarcer. One of the best archaeological examples for nonroyal governance comes from the uniquely preserved community of Cerén, where Payson Sheets and colleagues have identified a civic complex and diviner's building (Gerstle 2002; Simmons and Sheets 2002). At Chan the identification of an audiencia-style building linked to a divination room suggests that administrative and judiciary functions were joined in the governance of the site. This is perhaps unsurprising given that administrative and judiciary functions tend not to be differentiated in preindustrial societies (Durkheim 1997 [1893]; Evans-Pritchard 1940; Inomata and Houston 2001). The archaeological parallels between Chan's audiencia and divination room and Cerén's civic complex and diviner's building are striking. Together these two examples indicate basic commonalities in the ways that leaders of farming communities administered and resolved disputes in their communities.

The political strategies which Chan's leaders developed across its 2,000-year history were a blend of what Blanton and colleagues (1996) refer to as individual-centered and group-oriented strategies. Individual-centered political strategies involve principles of hierarchy and political actors' monopoly control of sources of power. Group-oriented strategies involve principles of heterarchy and sharing of sources of power among groups. As Blanton and colleagues note, individual-centered and group-oriented political strategies always coexist within any political system, but typically one strategy or the other is dominant.

Individual-centered political strategy can be seen in the veneration of individual ancestors and the revisitation of their graves across the Preclassic and Classic periods, although ancestor veneration was also a group endeavor, as the living relatives of the deceased were responsible for the burial of ancestors and larger groups of people, even at times the whole community, came together to revere their burial.

The focus on the individual ancestor as a part of ritual and political process was most marked at Chan in the Preclassic period. Preclassic burials were accompanied with more grave goods than their Classic period counterparts (Novotny, ch. 12, this vol.). Curated Middle Preclassic figurines with unique facial characteristics that may represent actual portraiture were interred in Late Preclassic ancestral burials, possibly to link the deceased with founding members of Chan (Kosakowsky et al., ch. 15, this vol.). In terms of shell ornamentation, only two burials at Chan, Late Preclassic Burial 10 and Terminal Preclassic Burial 2, were accompanied by shell ornaments that marked individual identity (Keller, ch. 13, this vol.).

While the political strategy of Chan's leaders always combined both individual-centered and group-focused strategies, by the Classic period political strategy at Chan had come to be dominated by group-focused strategies. Ritual activity in Chan's community center shifted from a focus on individual ancestors to a focus on the community as a whole (chapter 6). Feasting, the absence of extreme social stratification, and the comparability in the quality of luxury items possessed by all residents in the community are all aspects of group-oriented political strategies that were important at Chan in the Classic period, and certainly earlier.

The political strategy developed and practiced by Chan's leaders is different from that developed by Classic period royalty, who epitomize the individual-centered strategy in Blanton and colleagues model. More group-oriented political strategies have been documented late in the Classic period associated with political fragmentation of systems of kingship (Fash 1993; Fash et al. 1992; Tate 1992), as well as in the Postclassic period (Braswell 2001; Ringle and Bey 2001). Such political systems are generally seen as a breakdown in the Classic Maya system of divine kingship. As Angela Keller discusses in chapter 13, the Classic period development of group-oriented political strategies at Chan indicates that there was a greater variety of forms of governance in the Classic period than systems of kingship. Group-focused political strategies of the Postclassic and colonial period may owe as much to the development of such strategies on the part of Classic period farming communities such as Chan as they do to the breakdown of the system of kingship.

8

"Empty" Spaces and Public Places

A Microscopic View of Chan's Late Classic West Plaza

BERNADETTE CAP

The Maya created a built environment composed of a variety of architectural features and nonarchitectural spaces. Much of the archaeological research on the ancient Maya has examined buildings, but in this chapter I focus on a particular type of space, the plaza, which on the surface often appears to be empty space. However, in the past, plazas were likely filled with activities and a variety of architectural features. Maya plazas were intentionally constructed spaces that varied by size, accessibility, location within a site, the number and type of structures that mark their edges, and the activities that took place within them.

Plazas are public spaces where individuals from across the social, political, and economic spectrum come together for communal events. The experiences shared there would have been important for forging relationships, including those that constituted a community identity. Inomata (2006) proposes that leaders of polities used plazas to sponsor events that would aid in legitimizing their authority and integrating a community. Plazas also could have served as socially acceptable locations to express dissent. Although scholars have proposed many functions for Maya plazas, few have directly tested their ideas. However, recent methodological advances allow us to evaluate empirically the actual activities that occurred in them. Using a variety of methods, several researchers have begun intensive investigation of plaza spaces (for example, Cap 2007, 2008; Dahlin 2003; Jones et al. 1983; Keller 2006; Wells 2003; Wurtzburg 1991).

In this chapter I build upon this previous research and present results of my investigation of the West Plaza, located in Chan's community center (see chapter 1, figure 1.2). The Chan community center contains two plazas, the Central Plaza and the West Plaza, which have very different construction histories (see chapter 6, figure 6.1). Whereas the Central Plaza was the focal point of ceremonial and administrative activities throughout Chan's long 2,000-year history (650 BC–AD 1150/1200; see Robin et al., chs. 6 and 7, this vol.), the West Plaza was largely constructed in the late Late Classic period (AD 670–800/830), the period of Chan's maximum population expansion, and used through the Early Postclassic period (AD 900–1150/1200). Population growth may have spurred on the construction of the West Plaza, as its openness and accessibility would have allowed for a larger portion of the population to see and participate in events than would have been possible in the Central Plaza space alone.

Chan provides an ideal case study for examining how plaza spaces were used and for developing understandings of how plaza activities might have affected the community. Chan's Central Group has been identified as a locus of activities that would have had significant impacts on the political, social, and religious organization of the community (Robin et al., chs. 6 and 7, this vol.). Adjacent to and adjoining the Central Group, the West Plaza and the activities that took place in it also would have been integral to building relationships within the community.

The West Plaza and Central Plaza provide an excellent comparative case for examining how size and accessibility of a plaza can affect the types of activities that occurred there, as well as the potential number of participants. Access to the Central Plaza grew more restricted through time, and by the late Late Classic period the structures surrounding the plaza were quite substantial. At this time there were only two entryways into the Central Plaza: one located at its northeast corner and the other at its southwest corner. By way of contrast, the West Plaza in the Late Classic period was quite open. The eastern edge of the plaza is completely free of buildings, and its broad south stairway facilitated easy access to the space. These differences in accessibility were intentional aspects of the plaza's design and may have affected the types of activities that occurred there as well as those able to participate in them. Thus, each of the plazas had a distinct role in creating and sustaining a dynamic community.

Chan is also an ideal location to test the argument that plazas had distinct functions because Chan's plazas are relatively small in comparison with plaza spaces at larger Maya ceremonial centers. The Central Plaza measures approximately 1,154 m^2, and the West Plaza is 1,528 m^2 (or 1,928 m^2 if the area of the south stairway is included). In 2005, Michael Latsch excavated 1 m by 2 m test units at 5 m intervals across the West Plaza. These identified a number of low features in the open and seemingly empty plaza space south of Structure 8. The small size of the West Plaza allowed us to expose a large contiguous area in 2006 (18 percent of the broad open space south of Structure 8). With such a large exposure investigated through multiple methods, we can build detailed understandings of the different types of activities that occurred there and their spatial distribution. Additionally, full-scale horizontal excavations were conducted on Structure 8 at the north end of the West Plaza by Michael Latsch.

The Chan project investigated both the Central and the West Plaza to determine the types of activities that took place and their role in structuring a dynamic society. The discussion here focuses on results of work completed in the West Plaza.

Plaza Activities and Archaeological Correlates

There are no known Classic period texts that speak directly of plaza spaces and their uses. However, Reents-Budet (2001) has documented three painted vessels that portray activities taking place in plazas. An additional 23 vessels show activities occurring in front of structures in spaces that could be plazas. The activities portrayed on these vessels tend to be related only to the reenactment of mythical events and rituals involving elites. While these vessels are valuable for showing at least one type of activity that took place in plazas, they do not necessarily show the amount of space used, the full audience, additional activities taking place in the same area, and other details important for understanding the context of the rituals.

Accounts of the colonial period provide additional ideas about what might have taken place in Classic period plazas. These records show that a wide variety of public events were staged, including religious ceremonies (Barrera Vasquez 1965; Estrada Monroy 1979; Landa [Tozzer 1941]), marketplaces (Landa [Tozzer 1941]; McNatt 1912; Oviedo y Valdes 1851; Ximenez 1929), and tribute collection (Restall 1998). These documents focus on large-scale religious and economic activities, leaving out the small-scale social gatherings that also likely took place. While the colonial Maya culture is not a mirror for the Classic Maya, I suggest the basic types of activities represented in historic texts took place in Classic times as well. However, the material expression of these activities would have been unique to that period.

Plaza activities served multiple functions and had a myriad of meanings for participants. To simplify discussion of plaza activities I suggest there were at least three general types of activities that took place: (1) political/religious ceremonies, (2) economic transactions, and (3) social gatherings.

There are multiple expressions of each of these types of activities involving a range of material goods and architectural features. The discussion below is a compilation of correlates used to identify plaza activities and highlights some of the archaeological similarities and differences between activity types.

Political/Religious Events

Distinguishing political from religious events is difficult in the Classic Maya world because the two realms were deeply intertwined. Therefore, I consider them together. Ethnohistoric analyses and Classic period pictorial representations suggest that religious/political activities could have included rituals such as bloodletting and tribute offerings to the gods or rulers, inauguration of rulers, period-ending events, and feasting. Burning incense, praying, singing, dancing, and recitation of texts are also linked with ritual activities. Central performers in these activities were adorned with a unique assemblage of accessories and clothing that made them stand out from others. Artifacts and architectural features that would reflect these activities include objects such as bloodletters; caches of rare, symbolically charged items (for example, jade and incense); high frequencies of serving vessels; elaborate costume elements; hearths and associated food debris; stelae and altars; and platforms for performances.

Economic Transactions

Economic transactions could have been formally structured through mechanisms such as a marketplace or could have taken place on a smaller, more informal scale. A formal marketplace is more likely to be recognized in the archaeological record because such marketplaces typically meet at regular intervals in the same location over long periods of time. The actual physical exchange of goods in a marketplace is not directly observable; rather, the archaeological signatures of a marketplace are related to the spatial organization of the marketplace and its activities. Some of the possible correlates of a marketplace include low platforms spaced closely together with pathways between them (see Dahlin 2003 and Wurtzburg 1991), separation of goods by material type (for example, Feldman 1978), food preparation debris, small-scale craft production of lightweight portable items (Cap 2008; Hirth 2009; Keller 2006), and a lack of domestic or ritual artifacts and architectural features.

Social Gatherings

Typical social events that might have taken place in public plazas include dances, musical events, recitation of texts, feasting, and meetings with friends and family. Archaeological signatures of these types of events include low platforms for performances, a high frequency of serving vessels, hearths and associated food debris, musical instruments, and/or elaborate costume elements.

Identifying Plaza Activities

Trying to identify these activities in plazas using the archaeological record has proven to be challenging. Many public events involve only verbal or physical actions that lack strong material components (for example, praying, reciting texts). Some activities are based on the removal of goods after their use or acquisition (for example, a marketplace or religious ceremony). There is also overlap in the type of archaeological signatures of different activities (for example, low platforms can be used for multiple activities; specially decorated clothing can be worn for a variety of events). Additionally, multiple types of activities likely took place in the same plaza space, which could blur and mix the material record of specific events. To address the methodological challenges of identifying plaza activities, researchers in the Maya area have used a variety of methods common to investigations of nonarchitectural space. These include spatial analysis of site layout (for example, Inomata 2006; Jones 1996), surface artifact collection (Wurtzburg 1991), systematic shovel testing (Cap 2007, 2008; Keller 2006), broad exposure or extensive test excavating (Cap 2007, 2008; Dahlin 2003; Jones et al. 1983; Keller 2006; Wells 2003), microartifact analysis (Cap 2007, 2008), soil chemistry (Cap 2008; Dahlin et al. 2007; Wells 2003), and remote sensing (Haley et al. 2007). Each of these methods provides a different perspective of activities, and they are most informative when several, if not all, are applied to the same study area. Using a combination of these methods is essential for understanding plaza activities.

During the investigations of Chan's West Plaza, we used a variety of these methods. We conducted systematic post-hole testing, soil chemical analysis, and test excavating to determine generally where activities took place and, when possible, the type of activity. Using the data gathered with these methods, we then chose specific areas of the plaza to expose more fully. Collection and analysis of microartifacts was a major focus of this project because they often represent primary depositional contexts. Microartifacts are especially important for identifying activities in plaza spaces because large objects were often removed during regular cleaning of the plaza. This overall approach resulted in a wealth of data that leads us to suggest the West Plaza was the venue for important public ritual activities in the late Late Classic to Early Postclassic periods.

Investigations in Chan's West Plaza

While the Central Group was first mapped by the Xunantunich Settlement Survey in 1994 (Robin et al., ch. 2, this vol.), the West Plaza was not recognized until the 2003 season of the Chan project because it is a largely open space. Structure 8, which is located along the north edge of the West Plaza, was mapped in 2002, but heavy secondary growth prevented the identification of the plaza at this time. The West Plaza was identified in 2003 when systematic post-hole testing was conducted to explore the seemingly empty space around the Central Group. Preparation for the post-hole testing involved clearing a 50 m area in all directions around the Central Group, and it was because of this work that the West Plaza was discovered.

Four different types of features mark the edges of the West Plaza (see chapter 6, figure 6.1). On the east edge is the rear portion of the western structure (Structure 7) of the E-Group, which has its front in the Central Group. Marking the north edge of the West Plaza is a low L-shaped structure (Structure 8). Structure 8 was initially constructed in the early Late Classic period (AD 600–670), with its last construction phase dating to the late Late Classic to Terminal Classic periods (AD 670–900) (Kosakowsky 2008; Latsch 2005). Other than the E-Group and Central Plaza, Structure 8 was the only location in Chan's community center where burials were identified (Novotny, ch. 12, this vol.). L-shaped structures have been found near site entrances at sites such as Xunantunich (Keller 2006) and Dos Chombitos (Neff et al. 1995), suggesting that this particular structure type might have been used across the upper Belize River valley to indicate formal site entrances. Along the west edge, the plaza is demarcated by a limestone outcrop that appears to have been modified. Finally, the south edge of the plaza consists of a broad stairway roughly 20 m wide that descends approximately 20 m down a slope. At the top and on the edge of the stairway is an outset section of the plaza. The stairway was constructed during the late Late Classic and would have been the formal entrance into the plaza at that time. Another entryway into the plaza could have been from the west, as the area is open and free of obstructions. Access was restricted along the north edge of the plaza because of a steep slope behind Structure 8.

Excavations revealed the West Plaza was initially constructed during the Late Preclassic period (350 BC–AD 100/150). At least two phases of plastering took place at this time, suggesting this was a formal space used for specific purposes. There is no evidence for earlier use of the area in the Middle Preclassic period (650–350 BC), when the Central Group first became a center for ritual activity at Chan. Additionally, there is little evidence of activities in the West Plaza during the subsequent Terminal Preclassic (AD 100/150–250) and Early Classic periods (AD 300–600), periods of significant growth in the Central Group. The initial construction of Structure 8 began in the early Late Classic (AD 600–670), at which time the open space of the West Plaza had an area of approximately 1,083 m^2. The West Plaza itself saw its major period of construction starting in the late Late Classic period (AD 670–800/830) when the plaza went through several physical changes. Its south edge was extended roughly 10 m with the creation of an approximately 25 cm thick layer of limestone gravel and cobbles. At this time the south stairway was also constructed. The plaza extension and south stairway combined to nearly double the open space of the West Plaza, which would have had an area of 1,928 m^2. The final ancient uses of the West Plaza date to the Terminal Classic and Early Postclassic periods (AD 800/830–1150/1200), as is the case for the Central Group. Our excavations focused on the plaza surface and features from the late Late Classic to Early Postclassic periods. The following discussion describes our findings from these periods, moving from a macroscopic perspective to a microscopic view.

The Macroscopic Perspective

The West Plaza's architectural features (figure 8.1) and the artifacts recovered there allow us to build interpretations of the activities that took place in this space. During the late Late Classic, in addition to expanding the plaza by 10 m, members of the Chan community constructed a freestanding wall running east–west across the plaza. Measuring 20 m in length, the wall is constructed of cut limestone blocks. Its two faced sides are spaced 40 cm apart. The foundation of the wall was built with large natural limestone boulders on top of which were placed at least four courses of cut blocks. This created a wall with a minimum height of roughly 50 cm. Limited excavations into the space between the faced sides of the wall did not reveal

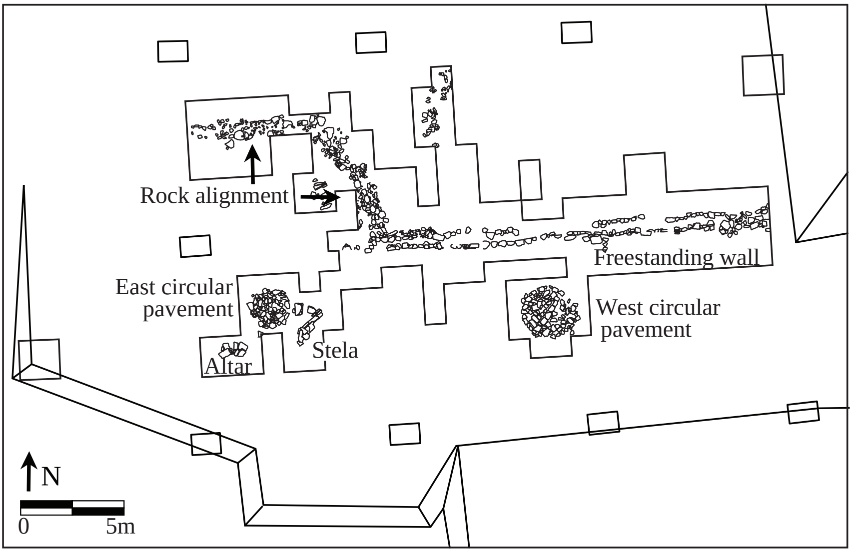

Figure 8.1. Excavation areas in Chan's West Plaza and architectural features exposed. (Illustration by Bernadette Cap.)

evidence of postmolds or daub, suggesting that the wall was constructed to be a low feature.

Freestanding walls in the Maya lowlands are not common features and vary in height, width, length, and construction technique and quality (Dahlin 2000; Rincon 2007). Most often, freestanding walls are interpreted as defensive mechanisms, especially when other evidence of warfare is also found. Walls that serve to defend a site typically encircle key sections of a site and are either part of the original site construction plan or added later (for example, Dos Pilas and Aguateca [Demarest 2006]). Although the West Plaza wall does resemble defensive freestanding walls, the location of the wall within the West Plaza and features associated with it argue against a defensive function. An alternative functional interpretation of the West Plaza wall is that it served to divide the plaza space into north and south sectors, restricting access to the north part of the plaza and helping to guide individuals from the West Plaza into one of only two accessways into the Central Plaza. A comparative example is found at Xunantunich, where a low wall was constructed in the site's main plaza (Plaza A-I) during the Late Classic. The Xunantunich wall was constructed between two major structures and limited the north plaza entrance to the alleyway of the site's Ballcourt 2 (Jamison 2010). Construction of the Xunantunich wall suggests

Figure 8.2. Distribution of macro- and microceramics in Chan's West Plaza. (Illustration by Bernadette Cap.)

that site organizers intentionally wanted to control the movement of people in this space. I suggest a similar intent at Chan with the creation of the West Plaza wall.

Adjoining the west end of the freestanding wall is an L-shaped rock alignment that measures approximately 12 m in length. In contrast to the freestanding wall, this rock alignment consists of only one single layer of cobbles and natural limestone boulders. We did not recover evidence of any postmolds or daub. This feature does not appear to have blocked entrance into the north and east portions of the plaza and could easily have been stepped on or over. Having said this, I suggest it did serve as a barrier of sorts. In examining the spatial distribution of macrosized ceramic fragments (figure 8.2) and chert debitage (figure 8.3), the highest concentrations of both categories of artifacts are located in the center of the plaza where the freestanding wall and rock alignment join. A second concentration occurs along the east–west-running portion of the rock alignment. From this pattern it appears that the rock alignment was a designated area to deposit debris.

Artifacts found along the rock alignment do not provide a clear picture of the types of activities that took place. The lithic production debris along the rock alignment tends to lack cortex (60% of the sample lacks cortex) and the majority of the flakes are in the 2–4 cm size range (60% of the sample). These data are suggestive of the middle stages of production (for example, preform preparation); whether this assemblage represents primary production or redeposited debris is unclear and will be discussed in more detail below. Unfortunately, the preservation of ceramics is very poor and diagnostics were scarce (5.6% of the assemblage). Therefore, examining distribution of forms, which might help to suggest general types of activities (for example, feasting versus storage), was not possible.

Our investigations of the plaza north of the wall were limited. We uncovered several irregularly shaped rock clusters but recovered few artifacts. Therefore, the types of activities that occurred in this area and how they differed from activities south of the wall are unclear. However, south of the wall we exposed several interesting architectural features and artifact patterns indicative of specific activity types.

In the southern half of the plaza we uncovered two circular stone mosaic pavements, one to the east and one to the west. The east pavement measures 2 m in diameter; the west pavement is 2.5 m in diameter. Both are composed of one layer of flat limestone rocks (figure 8.4). Just above the west mosaic pavement we recovered a fragment of a ceramic figurine and a

Figure 8.3. Distribution of chert macro- and microlithics in Chan's West Plaza. (Illustration by Bernadette Cap.)

Figure 8.4. West mosaic pavement in Chan's West Plaza. (Photograph by Bernadette Cap.)

broken crescent-shaped chert eccentric. In addition, the majority of recovered brazier fragments and plugs are associated with the west mosaic pavement and could have been used in rituals to burn incense or heat up food (Ball and Taschek 2007). These artifacts are significant because they have been linked to ritual activity areas elsewhere at Chan (Blackmore 2003). In contrast, the area of the east pavement was relatively devoid of all artifacts.

Also associated with the west mosaic pavement are a stela and a broken rectangular stone I suggest was an altar (see figure 8.1). The now fallen stela is approximately 2 m long, and its highly eroded surface does not appear to have been carved. Directly under the rectangular altar we found a deposit of 259 *jute* shells, which is the highest concentration of shell in the plaza. All of the jute tips were broken, suggesting that they were used for food (Healy et al. 1990), perhaps consumed in association with events taking place in the plaza.

Stela and altar combinations are found at sites throughout the Maya lowlands, and they hold political and religious significance. Altars were likely receptacles for offerings or placeholders for censers used in rituals. Stelae are commonly found at sites in the main ritual plaza, but Keller (2006) has found that stelae also were erected to mark site entrances. Stelae were seated to mark calendric events, such as period-endings, and often portrayed key events in the lives of elites. Additionally, Stuart (1996) suggests the Maya viewed stelae as containing *ch'ulel*, or a divine life-force. He has epigraphically identified a stone binding ceremony called *k'altun* in which stelae were wrapped with cloth, perhaps to contain the monument's ch'ulel. This interpretation suggests that stelae were not just markers recording important events but were also integral elements in particular rituals. While we cannot be certain of how the West Plaza stela was perceived by the Chan people, its setting would have been an important and celebrated event in the community. The stela and altar likely became a focus of ritual activities and marked a formal entrance into the community center.

Currently, features similar in construction to the circular pavements have been found in only two other locations. Both of these pavements were located in public spaces in hinterland residential communities of the Blue Creek polity (U5 plaza complex [Giacometti 2002]; RS-21 at Rosita [Preston 2007]). In both of these cases, however, excavators recovered evidence of stone walls adjacent to and surrounding the mosaic pavements. Because of this, the pavements have been interpreted as specially prepared floors of structures. We did not recover any evidence of stone or daub walls surrounding the West Plaza mosaic pavements.

Circular structures are rare throughout the Maya lowlands and through time. During the Preclassic period, circular structures are found in hinterland settlements and are associated with public ritual activities involving human burial practices, caching of rare items, and burning copal (for example, Aimers et al. 2000; Hendon 2000; Hyde and Martin 2009; Sidrys and Andresen 1978). Circular structures reappear in the Terminal and Postclassic periods; predominantly at sites in the northern Yucatan area. However, they have also been found at sites in the southern Maya lowlands and are thought to be evidence of linkages with northern Yucatan Maya sites (for example, Chase and Chase 1982; Harrison-Buck and McAnany 2006; Kowalski et al. 1996). Many circular structures constructed during this time are interpreted as ritual shrines. While the West Plaza mosaic pavements are not structures, the artifacts, stela, and altar associated with them provide data to suggest they were used for ritual performances.

Most of the data presented thus far strongly support an interpretation of ritual-based activities in the plaza, but there is a collection of artifacts that are more ambiguous as to the types of activities they represent. For example, we recovered two polished slate drilled pendants and one ceramic bead. Were these items of personal adornment lost during ritual performances or randomly lost by individuals passing through the plaza? The low frequency and lack of clustering in their distribution prevents a clear understanding of their meaning in the plaza context. We also found several granite mano and metate fragments (*n*=4), ceramic net sinkers (*n*=2), chert general utility bifaces (*n*=12), and chert spokeshaves (*n*=8) scattered across the plaza. These are items typically associated with activities in the domestic sphere. What are they doing in the plaza? Were they used in association with the rituals, or do they represent a different set of activities that lack as clear an archaeological signature as those related to rituals? Could these items represent goods exchanged in a marketplace held during or between ritual performances? Ethnohistoric and modern accounts reveal that plaza spaces were used for multiple activities. Are these artifacts traces of the variety of types of activities that took place? For now, these questions will remain questions. As more plaza studies are completed and we gain more understanding of the archaeological correlates of plaza activities, hopefully these ambiguous patterns will contribute to more refined interpretations of the activities that took place in the West Plaza.

The Microscopic Perspective

From the macroscopic perspective, it appears that the West Plaza was used for political/religious ceremonies and other activities. These data also show division of space within the plaza. The wall and rock alignment divide the plaza into north and south sectors, while the distribution of ritual architecture and artifacts indicates division in the use of the east and west areas. Even more can be understood about these patterns with the examination of microartifacts. Microartifact analysis is a time-consuming process, but the detailed information it can offer is worth the effort.

One of the difficulties in identifying the types of activities in plaza spaces is that plazas were likely swept clean of large debris on a regular basis. Microartifacts, however, remain close to their original location of deposition (Gifford-Gonzalez et al. 1985; Nielsen 1991a). Small objects tend to be trampled into surfaces over time, and there they become incorporated in the soil matrix, making them stationary and less susceptible to cleaning processes. Because of their stability in most sediments, microartifacts often have been used to distinguish between primary and secondary refuse deposits (for example, Fladmark 1982; Hull 1987; Sherwood et al. 1995). Primary refuse deposits tend to have high frequencies of micro- and macroartifacts, while secondary refuse deposits have few microartifacts but many macroartifacts.

Microartifacts are produced through several processes, including craft production (for example, stone tools and shell beads), disposal of trash, trampling of objects, natural water and wind erosion, and processes of soil formation. Each material type will be affected by these processes in different ways. For example, ceramics break down into their constituent parts and lose interpretative value at a larger size than lithic production debris. Because of these different formation factors, interpretations of microartifact patterns should proceed by material type and take into consideration context, associated macroartifact and architectural patterns, and effects of natural erosion processes.

Because of the variety of processes that create microartifacts and differences in how material types are affected by them, I have created general expectations for the West Plaza microartifact assemblage by specific material type. The major material classes found in the samples include ceramics, stone production debris, unmodified stone, and resin.

Types of Microartifacts

Ceramics

Ceramic microartifacts were identified by their color (red, tan, brown) and temper inclusions. Microceramics are broken down through the pressure of human trampling and natural chemical processes that degrade the cohesion of the clay and temper. The presence of microceramics is likely the result of these processes, which could take place in primary use areas or secondary disposal locations. I would expect that if macro- and microartifact distributions mirror each other, then the presence of the microartifacts is due to in situ effects of trampling and/or chemical breakdown. If, however, the distributions differ, then other processes are involved (for example, sweeping and sheet wash) and must be examined on a case by case basis.

Lithics

Debris from chipped stone production was divided into flakes, shatter, and tool fragments as well as by stone type (for example, chert and obsidian). Characteristics such as sharp edges, striking platforms, bulbs of percussion, and thinness were some of the features used to identify culturally modified stone. The main degradation process of microlithics is trampling, which breaks the object into smaller pieces but does not necessarily affect all of the artifact's distinguishing characteristics. Microlithics arrive in the archaeological record through production activities and loss of items. Where knapping activities take place, a high frequency of microlithics is expected (Fladmark 1982; for an exception to this argument, see Clark 1986, 1991a). This is due to the large number of small artifacts created in the production process and the difficulty of removing them through cleaning processes. However, I would expect that microlithics could be found in secondary deposits due to thorough cleaning but their frequency would likely be much lower than in primary production locations.

Unmodified Stone

Unmodified stones typically have intact cortex on the entire object and rounded edges. Their presence in archaeological contexts can be due to cultural or natural processes. The type of stone and context in which they are found are key to understanding which transformation processes or activities are in effect.

Resin

Resin is a natural tree material that can be burned to create smoke. It is identified at the microlevel by its black (sometimes shiny) color and internal structure, which is very porous. Resin breaks down into small fragments in the process of burning as well as through trampling and natural processes. In archaeological sites, the presence of burned resin is almost always due to cultural activities.

Microartifact Analysis Methods

During the West Plaza excavations, we collected a 10 liter bulk sample of soil from the center of each excavation level and processed it through a standard flotation system. A 10 liter sample resulted in a large amount of heavy fraction to examine, but we felt that a larger sample would increase the likelihood of recovering rare items. The following discussion is based on 69 analyzed samples spaced 1–2 m apart across the plaza. I also analyzed additional samples from off-plaza locations with known contexts (for example, middens, lithic end-stage production zones, and agricultural terraces). These samples provide information on how microartifacts are reflected in a variety of identifiable contexts.

The initial step in processing the flotation heavy fraction entailed dividing the sample into size grades. The sizes used for this project are >1 cm, 1 cm–4 mm, 4–2 mm, 2–1 mm, and <1 mm. There currently is no official consensus as to which size of microartifact is the best to analyze. Dunnell and Stein (1989) suggest that microartifacts are those smaller than 2 mm in diameter because it is at this size that a microscope has to be used for artifact identification. However, with the Chan sample set, I began using a microscope for identification purposes with artifacts 4 mm and smaller and was able to more confidently identify artifacts at the 4–2 mm size than smaller sized microartifacts. In addition, a study by Nielsen (1991b) showed that artifacts between 4 mm and 2 mm were more stable when surfaces were swept with a broom than smaller artifacts. For these reasons, I have chosen to analyze and report here on microartifacts in the 4–2 mm size range.

After dividing the samples into size grades, I hand sorted approximately 30 percent (by weight) of each sample and recorded the weight and count of all materials present. From the portion of the sample analyzed, I estimated the total count and weight of each material type. The counts and weights presented here are those estimates.

Microartifact Results

The microartifact analysis reveals a more detailed view of the division of space within the plaza and sheds new light on the nature of rituals that took place. As well, microartifact studies documented a new artifact class, resin, which was not identified at the macroartifact level.

Ceramics

The distribution of microceramics mirrors that of macroceramics, with the highest frequencies associated with the rock alignment (figure 8.2). Therefore, I suggest the presence of the microceramics is due to natural or cultural breakdown of the macroceramics after their deposition in this location, likely from trampling.

Chert Lithics (Flakes and Shatter)

There is one area of dense microchert lithic production debris located at the bend in the rock alignment (figure 8.3). This pattern is different from the macrolithic distribution, which is highest along the western and southern ends of the alignment. Could the bend in the rock alignment be a lithic

Table 8.1. Chan chert microdebitage comparison by context

Site	Context	Count[a]
Chan	Agricultural terrace	11
Chan	Household midden	13
Chan	Jute midden	59
Chan	West Plaza	85
Buenavista	Edge of plaza-area chert production zone	90
Buenavista	Center of plaza-area chert production zone	654

a. Each context listed is represented by one 10 liter heavy fraction sample. Chan counts are estimated totals based on the analysis of 30 percent of each sample. Buenavista counts have been adjusted by volume to be comparable to the Chan samples.

production zone while the rest of the alignment area was used to deposit large-sized production debris? If this macro and microartifact pattern was found in a household context, where lithic production is known to occur, a logical conclusion would be that the pattern represents separate areas of primary lithic production and redeposition. However, because the samples are from a plaza, where we are just learning how to identify past activities through the archaeological record, a closer examination of the data is warranted.

To investigate this pattern further, I compared the frequency of microlithics along the rock alignment to microlithics in other known contexts at Chan and the site of Buenavista (table 8.1). As table 8.1 indicates, compared to an area with known end-stage chert lithic production at Buenavista, the number of microlithics along the entire length of the rock alignment is low. By raw count, the sample with the most chert lithics in the West Plaza most closely resembles the Chan jute midden (see Keller, ch. 13, this vol.) and a portion of the lithic production zone at Buenavista. This comparison suggests that the high microchert lithic Chan samples could represent either redeposited debris or an area of low-level lithic production. These are very different interpretations, and each has separate implications for the types of activities that could have taken place in the plaza. Because the data are equivocal, I will not select one interpretation over the other but rather leave this issue open for debate.

Unmodified Stone

The majority of unmodified stone in the West Plaza is limestone. Given that bedrock in this area is limestone, located about one meter below the modern ground surface, one might expect limestone levels to be fairly similar across the plaza. However, the highest frequencies of limestone occur south of the freestanding wall. This distribution coincides with the area of the plaza expanded in the late Late Classic with the addition of a 25 cm layer of limestone gravel, the top of which served as ballast for the late Late Classic plaza surface. Microartifact samples were collected from the top of this layer and therefore are reflecting this construction.

Resin

Finding burned resin, commonly referred to as copal, in the West Plaza was unexpected. Its distribution within the plaza is spatially limited and speaks to the location and type of activities that took place. The resin is almost exclusively located in the west circular mosaic pavement. Directly under the west pavement is a thick layer of black soil. The burning of the resin and the buildup of resin fragments over time formed this layer. A very small amount of resin was also found in the east pavement. The Maya used copal in many different ceremonies (Tozzer 1941; Tedlock 1985) to create smoke and possibly as tribute to the gods (Stross 1997). I suggest the resin found in the West Plaza was used for similar purposes.

Discussion and Conclusion

The West Plaza is the kind of archaeological space that initially appears empty to us—so much so that it was not until two seasons into investigations at Chan that the plaza was identified as a constructed space. Excavations and macro- and microartifact analyses clearly show that the West Plaza was filled with activity, specifically, those activities that would have affected the religious, political, and social dynamics of Chan. Other locations for religious/political rituals at Chan include the Central Group (Robin et al., ch. 6, this vol.) as well as households across the site (for example, Blackmore, ch. 9, this vol.; Robin et al., ch. 7, this vol.; Wyatt, ch. 4, this vol.). While important events took place in these various locations, they all had different patterns of access. Only a certain number of people could attend household-based ritual events, even those taking place in patio areas within households. By the late Late Classic period, access was more restricted to the Central Plaza than it was to the West Plaza. At this time, Chan's population had reached its peak, which may have created further need for ritual space to accommodate the growing size of the community. The West Plaza reached its greatest spatial extent at this time and became more easily accessed both physically and visually. The use of entry markers (for example, the stela and L-shaped structure) indicates an intent to establish the West Plaza as the formal physical entryway into the community center. West Plaza rituals were likely linked with those taking place in the Central Plaza, and therefore the West Plaza also served as a portal to Chan ritual activities and ideologies.

Rituals in the West Plaza played a role in transforming social and political relationships among Chan inhabitants. The ritual objects and features used in the West Plaza, such as the stela, altar, incense, chert eccentric, ceramic figurine, and braziers, are also found in ritual contexts at other Maya sites, suggesting that Chan ritual leaders were drawing on shared conceptions of ritual practices. Additionally, the differential treatment of the east and west sides of the plaza, which parallels the east–west focus of the E-Group in the Central Group, could be tied to pan-Mesoamerican cosmological ideologies relating to views of east (rising of the sun) versus west (setting of the sun). Creating linkages to broadly held ideologies would have been important for unifying a potentially diverse population. Because the West Plaza is an easily accessed space, many members of the community would have been able to view or participate in the rituals taking place. The shared experience of viewing/participating in these rituals would have been important for sustaining commonly shared ideologies and would have aided in building cohesive relationships.

The West Plaza rituals also could have created differences among Chan inhabitants. Rituals often involve a small number of individuals with special access to particular spaces, objects, and knowledge, performing for a larger audience. The ritual performers could have held a unique status, different from the ritual observers or secondary participants, and may have used their position to gain and legitimize authority or power over others. Additionally, the organizers/hosts of the rituals held a different status than those who were invited to participate in them. The ability to sponsor a ritual event may have been limited to a small group of people who could have gained political/religious clout from their special role. However, I suggest that by drawing on shared ritual ideologies manifested archaeologically in ritual paraphernalia and architecture, tensions that may have arisen among the central actors and secondary participants of the rituals, due to differential roles and authority, may have been lessened.

Finally, I will add a methodological note. Obtaining data from both the macroscopic level and the microscopic level was essential in this project. Plaza spaces are difficult to study because of the manner in which many cultural and natural transformation processes alter the archaeological record. The methods used in this project were chosen because they could offer a fine-grained view of the activities in the West Plaza. Hopefully, the results of this project also attest to the strength of using multiple lines of evidence in studies of so-called empty spaces.

3

Diversity across the Chan Community

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9

Recognizing Difference in Small-Scale Settings

An Examination of Social Identity Formation at the Northeast Group, Chan

CHELSEA BLACKMORE

From the small-scale grandeur of the community center to its single-phase domestic mounds, Chan contains a wide array of material culture—some of which belies traditional archaeological notions of commoner life and behavior. The diversity of the community forces us to question archaeological assumptions of who commoners were and how static models of commoner life have affected our interpretations of ancient Maya society. Because evidence for social diversity is less tangible than for other aspects of the past, archaeologists tend to focus on the more dramatic and better-preserved remains of elite centers. Although such work has produced a rich and textured picture of elite life, it has created an unfortunate by-product, whereby elites are assumed to be the template for the rest of society. Because our analytical categories are based on the rich, wealthy, and powerful, commoner populations, in comparison, appear unobtrusive, static, and relatively simplistic. While the categories of "elite" and "commoner" reflect the extreme ends of a social continuum, they inadequately characterize, if not obscure altogether, the reality of day-to-day social interactions and organization.

Research at the Northeast Group challenges these assumptions by examining how its occupants were themselves internally diverse. Specifically, how were differences in social identity and status expressed by community members, and how did these manifest within the settlement unit of a neighborhood? This chapter examines commoner social diversity through an analysis of the material and ideological practices carried out at the Northeast Group, one of several "neighborhoods" that make up the Chan community (figure 9.1; see figure 1.2 for the location of the Northeast Group

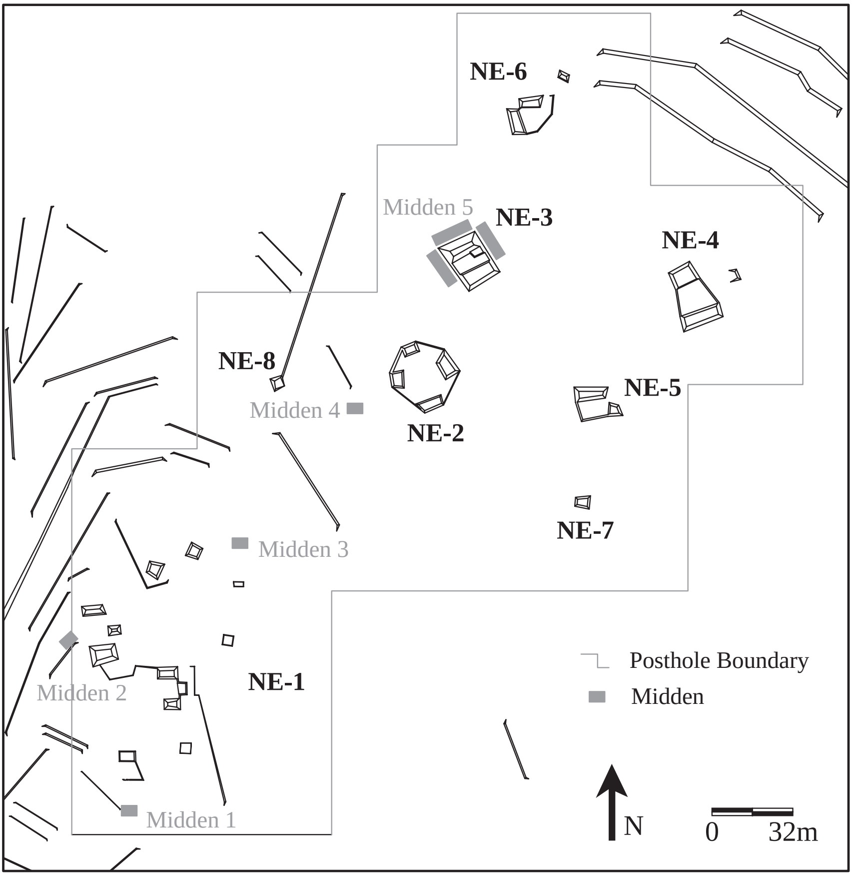

Figure 9.1. Northeast Group.

within Chan). By examining the function and organization of space and the corresponding distribution of material goods across the neighborhood, we can identify the activities in which people engaged; how these varied in relation to resource access; and the restriction and elaboration of particular spaces. Understanding how people distinguished themselves within the context of a neighborhood provides direct evidence of class complexity, challenging traditional models of commoner behavior and more importantly the role they played in ancient Maya society as a whole.

Class Identities and the State

Exploring constructed identities—the production and reproduction of diversity—is a key issue in the study of state-based societies such as the

Classic Maya. Relationships of power are a necessary avenue of inquiry for understanding the creation, maintenance, or rejection of different identities. Power and politics have been viewed, traditionally, as an outcome of the political economy—more specifically, how luxury goods, mass production, long-distance trade, and particular technologies (that is, ceramics) secure elite power and establish social affiliations among and between polity centers. Control over economic resources (that is, wealth) was seen as giving validation to claims of superior social standing; in effect naturalizing hierarchy so that power appears a priori. Power should be viewed, instead, as a simultaneous process of choice, resistance, and coercion, in which all people negotiate their position within society. According to Gledhill (2000: 38, emphasis in original), this stresses "the importance of cultural strategies of affiliation and negotiating relations of domination as central *variables* in these processes [i.e. state formation]."

In precapitalist states, people retain access to the means of production. Although social relations form differently in capitalist modes of production in comparison to others, structures of social inequality still exist in precapitalist states. These identities, in their multiple and messy forms, construct the social processes that we tend to divorce from daily life. Inequality, in particular, shapes economic and political processes, even when they emerge from the most "mundane" of social classes. Archaeologists have begun to ask how inequality and social distinctions shape, influence, and impact the larger political and economic spheres of society (Ashmore et al. 2004; Brumfiel 1991, 1992; Yeager 2000a, 2003). As a state-level society, the ancient Maya were enmeshed in multiple, overlapping levels of social organization, including factions, class, gender, status, lineage, occupation, and ethnicity. An important research direction is to examine how these facets of identity fluctuated depending on context, location, time, and social standing.

Lower-status or commoner households were neither apolitical nor powerless. Their productive capacities as farmers and laborers did not limit who they were or their interactions within and outside of their communities. Like elites, commoners were part of the state and must be examined in relationship to the discursive interactions between the state, individuals, and their communities. The state creates and reproduces identities often at odds with those enmeshed in kinship and lineage organization, helping in the maintenance of social hierarchy and control of productive labor and resources. These identities create new social conditions that create spaces of agency and resistance, among commoners and elites alike. Equating ancient commoners with modern-day peasant societies, a central, unchanging repository for tradition and communal culture, negates the variability in social identity and its relationship with the state. In recent years, an increasing number of scholars (for example, Lohse and Valdez 2004b; Robin 1999, 2002a; Yaeger 2000a, 2000b) have come to recognize the significant role of class organization as well as its inherent variability and ambiguity. While much of this research has focused on the identification of a Maya "middle" class (Masson and Peraza Lope 2004), in other cases scholars have begun examining the complexity of internal commoner politics. Studies at places like San Lorenzo, Belize, and Cerén, El Salvador, identify how social identity was marked by access to prestige goods and access to and control over public activities (L. Brown 2001; Yaeger 2000b). In a similar manner, occupants of the Northeast Group actively manipulated and used available symbolic and cosmological markers to define themselves within the context of their neighborhood (Blackmore 2011).

A Mid-Level Neighborhood at Chan

Occupied from the Early Classic (AD 250–600) to the Terminal Classic period (AD 800/830–900), the Northeast Group is characterized by six mound groups (NE-1–6) and two isolated mounds (NE-7–8), with buildings ranging in size from 0.2 m to 1.5 m in height based on excavated architecture (see figure 9.1). Excavation data identifies these eight groups as distinct social units or households. Five of the six correspond directly to Chan mound group types (chapter 2). NE-3 and NE-2 are type 4 mound groups, while NE-4, NE-5, and NE-6 refer to mound group type 3. A type 1 mound is located west of NE-2, and another is located south of NE-4. NE-1 does not fit neatly into this settlement hierarchy. Unlike the other groups, it is a loose collection of mounds, originally classified as having both a type 5 and a type 4 group. Phase I post-hole testing (described below) identified three middens associated with NE-1. As these may define house-lot boundaries, their identification suggests that NE-1 is a single social unit rather than two, as initially posited during the Chan settlement survey.

Chronological assessments were made based on type: variety-mode and form analysis of ceramics from excavated contexts. Ceramic analysis was based initially on Lisa LeCount's (1996, 2003, 2004b) work at Xunantunich and later refined by Laura Kosakowsky (2007, 2008), who established a chronology specific to the Chan site (chapter 3). Using count and minimum number of vessels (MNV), Late Classic ceramics made up 89 percent of the entire Northeast Group ceramic assemblage (see Blackmore 2008: fig. 5.1). Based on the terminus post quem of each household and respective architectural sequence, only two of the six groups tested, NE-1 and NE-6, were founded in the Early Classic. The remaining four groups, NE-2, NE-3, NE-4, and NE-5, were founded in the early and late phases of the Late Classic. Of these, only NE-3 was associated with an early Late Classic founding. The later founding of NE-2, NE-4, and NE-5 may be a result of differences in sampling strategies when compared to NE-3. NE-3 was the focus of horizontal and penetrating excavations while excavation at the other groups was limited to 2 m by 2 m test units.

Bound by steep hills and agricultural terraces along its west, east, and north edges, the Northeast Group fits archaeological and ethnohistorical definitions of a neighborhood (Bullard 1964; Fash 1983; Hammond 1972; Pyburn 1997; Vogt 1976). Bullard (1964: 281), for example, defines neighborhoods as a collection of households organized in a "hamlet-like cluster of 5–12 structures," while Vogt (1976) relates them to waterhole groups of modern-day Zinacantan. The proximity of households would have created a space for social interaction, establishing linkages among neighborhood residents as both members of the larger Chan community and a distinct subset within it. As a locus of intracommunity organization, neighborhood occupants maintained social ties through kinship as well as shared social, economic, and ritual activities. As a microcosm for the interactions of the Chan community, investigations at the Northeast Group provide a discrete testing ground for examining social relations, within and outside the settlement unit of the neighborhood.

Research and Analysis

Research and analysis were carried out over five field seasons, from 2003 to 2008. Given that research focused on neighborhood-level interactions, I established a research design that bridged survey and testing of the group as a whole with household-specific excavations. Field investigations were divided into two phases: Phase I survey, post-hole testing, and test units and Phase II areal and penetrating excavations (Blackmore 2007, 2008).

Phase I Post Holes and Test Units

Phase I was designed to determine overall occupation chronology, map the distribution of artifacts, and identify nonarchitectural activity in both on- and off-mound areas. Post-hole testing was designed to identify potential house-lots to identify materials and activities associated with households, such as middens and activity areas (Hanks 1990; Killion 1992a). Although ethnographic and ethnoarchaeological assessments suggest that house-lots typically extend 20 m from residential cores, Robin (1999: 127) has shown that boundaries and associated refuse may be found up to 30 m away. To take this into consideration, post holes were placed 6 m apart, and where possible the grid was extended to 30 m beyond mounds (see figure 9.1). Every fifth post hole and all of those containing 30 or more artifacts were examined with respect to stratigraphy, Munsell colors, and artifact location. Of the 812 postholes excavated, fewer than half (47%) contained evidence of cultural remains; only 13 of those yielded 30 or more artifacts.

Test units were placed adjacent to post holes that yielded high numbers of artifacts and within architecture to identify construction history and chronology of known architectural groups. Of the 13 post holes with high artifact counts, six were expanded into 2 m by 1 m test units. Five of these identified middens: three in association with NE-1 (middens 1, 2, and 3), one with NE-2 (midden 4), and one with NE-3 (midden 5). Middens 1, 3, and 4 were shallow in contrast to middens 2 and 5, which had denser deposition and higher diversity of materials (Blackmore 2008). Additional test units were placed as well into the patios of each house group, with NE-3 exhibiting the most complex architectural history identified. While all other groups had two to three patio construction episodes, NE-3 appeared to have at least four. Based on the above results, NE-1 and NE-3 were distinct in comparison to other households in architectural complexity (spatial complexity for NE-1 and construction sequence for NE-3), artifact diversity, and their association with middens.

Phase II: Architecture and Deposits

Based on Phase I results, Phase II work included areal and penetrating excavations of groups NE-1, NE-3, and NE-6. These excavations were carried out to establish each group's overall form and function; identify architectural plans, construction episodes, and spatial and chronological distribution of features and artifacts, as well as the potential socioeconomic composition of households. NE-1 and NE-3 were selected for excavation based on their architectural complexity. NE-6 was selected to represent the range and variability of households across the neighborhood.

Group NE-1

NE-1 consists of two connected three-mound groups, surrounded by six additional freestanding structures. Excavations were conducted at the northernmost three-mound group. Seven construction phases were identified. Structure 6, the northernmost structure, was constructed in six phases. Structure 4, the easternmost structure, was constructed in a single phase postdating the construction of Structure 6. The phase 1 founding of the group began in the Early Classic (AD 250–600) with the construction of a 20 cm high structure. By the beginning of the Late Classic (AD 600–670), residents had added to its overall height, width, and length. The remaining three phases were undertaken in the latter half of the Late Classic (AD 670–800/830), culminating in the construction of a 1.2 m high rectangular substructure with three 25 cm high benches built along its summit. Additionally, a crypt burial (Burial C4) containing a single adult aged 30 to 39 of unknown sex (Novotny 2008) was interred during Structure 6's terminal construction, placed in front of the building along its central north–south axis. The final phase of construction (phase 7) for the group was focused on patio resurfacing and the building of Structure 4, along the group's eastern edge. Structure 4 is a square, single-level structure (4.5 m by 4.5 m in basal area) with a three-course staircase located on its western face. Two burials were found in association with the structure—a single cist (Burial C3) placed under the stairs and a crypt (Burial C10) identified within the structure. Burial C3 contained a primary male adolescent aged 12 to 19 and a secondary individual, an adolescent aged 12 to 19 of unknown sex represented only by teeth (Novotny 2008). The male adolescent was buried with a piece of jade, two cut shell beads, and a third shell fragment. Burial C10 was not excavated.

Group NE-3

NE-3 is a tightly arranged three-mound patio group, located in the approximate center of the neighborhood. Excavations focused on horizontal and vertical exposure of Structure 3, a small (4 m by 3 m) ancillary structure on the east side of the group, and Structure 2—a larger residential building on the north side of the group. Five construction phases were identified at NE-3. The earliest construction was a stone substructure, 20–30 cm in height, dating to the early part of the Late Classic period. Phases 2 and 3 raised its overall height, width, and length, creating the patio surface upon which

Figure 9.2. Northeast Group hearth deposit (Special Deposit 1). (Photograph by Chelsea Blackmore.)

Structures 2 and 3 were built. In its terminal form, Structure 3 was 50 cm in height with basal molding along its lowest course of stones. It included a hearth, a 48 cm by 48 cm niche, built into the building's west face. Structure 2 was built up over the course of three additional construction phases. In its final form, it was a 1.5 m structure with a rectangular bench, 30 cm in height, and a seven-course staircase.

One of the more striking features of NE-3 was the density of burials and deposits. In 2004, a large (2.3 m N–S by 1.0 m E–W) and well-constructed stone crypt (Burial C1) was identified at the base of test excavations. Two individuals were interred, one placed on top of the other. Both individuals were adults of indeterminate sex, one aged 30 to 39 and the other aged 20 to 29. In 2005, three additional burials were recovered. The first of these was a crypt burial containing three individuals (Burial C5). Two were adults aged 30 to 39, one of indeterminate sex and the other a male. The third individual was a younger adult aged 18 to 20 years of indeterminate sex. Grave goods included 23 *Marginella* shell beads and a shaped shell disc. Adjacent to this was a 65 cm deep cist (Burial C6) cut into bedrock containing a single well-preserved male individual aged 20 to 29 lying face down. Although not excavated because of time constraints, a fourth burial (Burial C9) was identified in the western section of our trench. Other ritual materials included a lip-to-lip cache placed against the interior retaining wall built during phase 3 construction, interred at the same time as Burial C5. This included two unslipped "finger" bowls and two larger (27 cm diameter) unslipped bowls. A fifth vessel, a 26 cm unslipped plate, was placed on top of these. Excavation of the vessel's interior identified four poorly preserved fragments of bone. Based on the thickness and density of the bone's cortex, they were tentatively identified as human. A second major deposit was recovered as part of excavations that exposed phase 4 construction. Prior to resurfacing the patio, residents deposited ceramic vessels and food bone (Special Deposit 1) in the hearth identified for Structure 3 (figure 9.2). The hearth feature is a 48 cm by 48 cm niche built into the building's western facing stones. The deposit included burnt deer and peccary bone, shell fragments, ceramic and lithic fragments, two stacked ceramic dishes, and a 20 cm lens of ash. The entire deposit was then capped by NE-3's penultimate patio surface.

Group NE-6

NE-6 is a small, two-mound patio group, located at the north end of the neighborhood. Although it was founded in the Early Classic, only three construction episodes were identified. In their terminal phase, Structure 1 to the north was a 20 cm high structure and Structure 2 to the west was a 60 cm high, bilevel structure. Ritual practice consisted of two primary interments (crypt burials) and a single secondary burial. The two primary interments were placed along the central axes of Structure 2, one underneath its stairs and the other directly in front of the stairs. Burial C2 contained an adult of indeterminate sex, and Burial C4 contained an adult aged 20 to 24 of unknown sex (Novotny 2008). The adult individual in Burial C2 was interred with a piece of round worked shell and the adult individual in Burial C4 was interred with two obsidian blades. The secondary burial was a small cache of human bones identified from the patio's center; among them were two molars, one canine tooth, and fragments of long bones. A single artifact was found in association with the bones—a shaped disc of shell.

Artifact Distributions

Ceramics

Ceramic analysis examined the form, function, and distribution of materials across the neighborhood. Ceramics were analyzed from both primary and secondary contexts, with sherds weighing 555,419.65 g. At NE-6, bowls make up the majority of all open forms identified (88%). In contrast, NE-1 and NE-3 have a slightly more diverse assemblage, including plates, dishes, and vases (table 9.1). For NE-3, these forms constitute 17 percent of vessels identified, and for NE-1, 6 percent. Unslipped jars constitute nearly half (45.2%) of NE-6's overall assemblage, while they make up only 33.4 percent of NE-1 and 26 percent of NE-3 forms (Blackmore 2008: fig. 5.9). When compared to NE-1 and NE-3, few fine ceramic wares or specialty forms were identified at NE-6, suggesting that cooking, storage, and food processing were the primary foci of its residents. In contrast, finer, more decorative ceramics such as Silkgrass Fluted, Martins Incised, Gallinero Fluted, and Macal Orange were either unique to the NE-3 assemblage or found in slightly higher quantities. Additionally, the only two vases identified for the neighborhood came from NE-3: one Martins Incised vase and one Benque Viejo vase (see Gifford 1976).

Obsidian

Obsidian was analyzed to assess the form, function, and condition of material recovered during excavations. A total of 161 fragments of obsidian weighing 139.3 g were recovered from excavations of both architectural fill and primary contexts. Of the 161 pieces, 134 (94%) were prismatic blades. The remaining pieces included debitage and materials common to tool production (Blackmore 2008: table 5.5). But as these made up only 6 percent of the assemblage by count, it is highly unlikely that tool production took place in the Northeast Group. Because NE-1 and NE-3 are the two

Table 9.1. Northeast Group ceramic form distribution

	NE-1	NE-3	NE-6
Form	(%)	(%)	(%)
Bowls	66	61.5	87.5
Bowls/dishes	11.9	9.2	6.5
Dish	3.2	6.1	0
Plate	2.7	8.8	0
Vase	0	1.8	0
Unknown open	16.2	12.6	6

largest architectural groups of the neighborhood, it is important to identify distributional differences that occur between the two. An examination of primary deposits was key to understanding specific activities that may have differentiated the groups in association with access and utilization of obsidian. Of particular note is the recovery of 30.2 percent of blades from the five middens excavated during post-hole testing. Of the 46 pieces recovered from midden excavations, 29 were found in midden 2, a single piece in midden 3, 3 fragments in midden 4, and the remaining 13 recovered from midden 5 (see figure 9.1). If we compare the relative densities of obsidian artifacts recovered, it becomes clear that every midden, regardless of its location, had higher densities of obsidian than found in architectural fill contexts (table 9.2). Obsidian density for midden 2 is quite high at 23.77 pieces of obsidian found per cubic meter of soil excavated. Blades recovered from midden 2 alone constitute 19 percent of the entire blade assemblage. Considering that excavation volume was only 1.22 m^3, this is a substantial amount. While obsidian counts are relatively equal between NE-1 (*N*=57) and NE-3 (*N*=62), the density of materials from midden 2 suggests that its occupants used and disposed of the large majority of obsidian found throughout the neighborhood.

Table 9.2. Northeast Group obsidian and slate density

	Obsidian (density)	Slate (density)
NE-1 fill	0.69	1.67
NE-3 fill	1.18	0.68
NE-6 fill	0.91	1.04
Midden 2	23.77	19.67
Midden 3	1.92	1.92
Midden 4	3.26	1.09
Midden 5	6.11	2.35

Segment portions were also used to determine the minimum number of pieces (MNI) found within each context or excavation type. Because of their unique features, only proximal and distal segments were used to look at MNI. Again, midden 2 appears to have the largest concentration of blades, containing at least 17 distinct blade fragments based on the occurrence of proximal ends. While 13 fragments were recovered from midden 5, 10 of these were medial. Two proximal ends and a single distal end were also identified. Although the medial fragments cannot be identified as unique blades, the number of medial segments suggests that midden 5 may have had several more blades than just the two proximal ends reflect. Even if this is an accurate characterization, midden 2 still contains a disproportionately larger amount of obsidian blades than any other context found in the neighborhood. NE-1's proximity to terraces may explain this distribution. If the majority of agricultural activities occurred in and around this set of terraces, then obsidian blades may have been part of the cultivation and processing of plant material.

Slate

Found along the Macal River in the upper Belize Valley, slate is easily accessible to people living at Chan. At the Northeast Group, slate was found in all archaeological contexts in raw and culturally modified pieces. A total of 147 fragments of slate weighing 2290.9 g was recovered and analyzed from neighborhood excavations. Of these, 45 percent were unmodified raw fragments with the remaining 55 percent were modified, included various degrees of abrading, grinding, perforating, incising, sawing, and flaking (Blackmore 2008: tables 5.6 and 5.7). Of the modified pieces, 12 were ornaments and 8 were tools. When we look at slate distribution between household groups, a few trends are noticeable. First, over 70 percent of all slate recovered from the Northeast Group was found at NE-1. Eighteen percent of this came directly from midden 2, a higher density than that found in any of the other excavation contexts (see table 9.2). When we look at the distribution of materials by function, NE-1 has the highest frequency with 5 ornaments and 6 identifiable tools, including one side-notched pointed tool. In contrast, NE-3 contains only decorative items such as ornaments, one celt-like object, and a possible plaque fragment.

Jadeite

Jade commonly refers to jadeite or nephrite and was one of the most prized materials in Mesoamerica. While jade can be found in varying amounts throughout Mesoamerica, its most elaborate and decorative forms are usually found in elite burials and the deposits of civic centers. The ideological and ritual significance of jade, however, was not lost on the commoners at Chan (Blackmore 2011). Jade at the Northeast Group included seven pieces (figure 9.3). All are small unfinished fragments, no more than 3 cm in length. While their form is not identifiable, they each exhibit varying degrees of polish and shaping, although the minimal workmanship suggests that they may have been reconditioned fragments of larger ornaments or remnants of production debris. Five of the pieces were found in association with primary burial and collapse contexts of NE-1. Two were identified from collapse associated with NE-1, Structure 4: one located at the base of the structure's staircase and the other in the collapse along its northeast corner. Two additional pieces of jade were found in association with other grave goods in Burial C3 under Structure 4's staircase and Burial C2 found in association with Structure 6, NE-1. These were the only mortuary goods

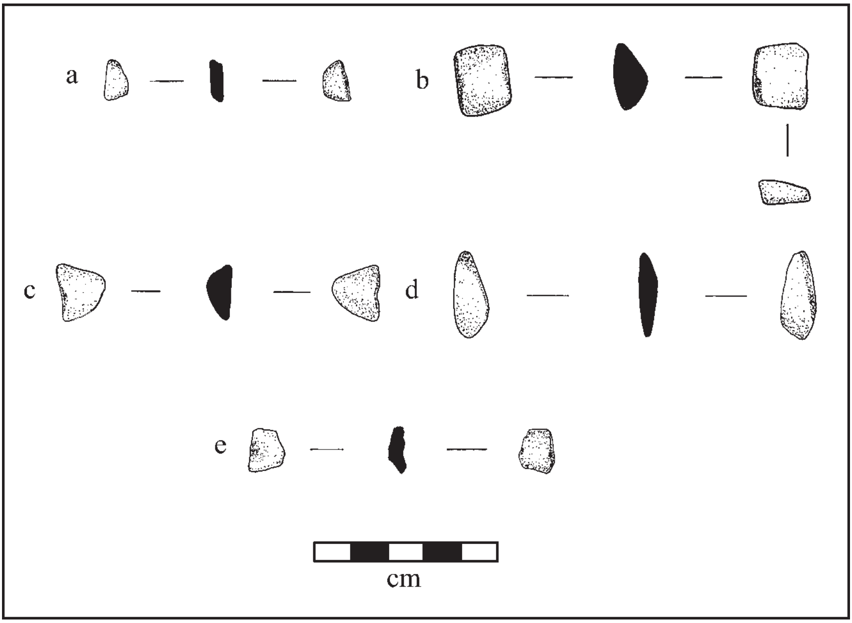

Figure 9.3. Jade objects from the Northeast Group. (Illustrations by Carmen Ting.)

of their type found in the neighborhood. The remaining two pieces were recovered from collapse contexts in NE-3's alleyway.

Shell

Angela Keller (2008) analyzed a total of 40 pieces of unworked marine shell and marine shell artifacts recovered from the Northeast neighborhood group. Of these, all but four were recovered from excavations at NE-3. Three of these were found at NE-1, including a fragment of an unknown marine bivalve and two *Spondylus* shell beads—grave goods associated with Burial C3 of Structure 4 (Blackmore 2008: fig. 5.30). The two shell beads were shaped, incised, and biconically drilled, deposited below the remains of a single individual lying face down in a capped cist. The fourth shell artifact was recovered from Burial C2 of NE-6—a flat round disk probably made from marine shell.

The remaining 36 pieces are associated with three contexts identified during excavations at NE-3—that of Special Deposit 1 (found in association with Structure 3's hearth), Burial C5, and the surface and overlying collapse contexts of alleyway 1. The first piece of shell identified from NE-3 was part of Special Deposit 1. This deposit, located in and around Structure 3's hearth feature, included a scattering of faunal bones, ceramic sherds, lithics, and a two unslipped bowls. A fragment of unworked marine bivalve was placed into the center of the stacked bowls. This was the only piece of shell found in association with the deposit. Shell was also found within and in overlying deposits of Burial C5. A possible dedicatory deposit was placed on top of Burial C5's capstones, characterized by ashy soil, bone fragments, and two pieces of shell. The shell included a broken fragment of a *Strombus* columella and a pendant made from a freshwater bivalve (*Nephronaias ortmann*). Within the burial, we identified an additional 23 *Marginella* shell beads and 2 disc-shaped ornaments—1 from *Strombus* and the other unknown. The remaining shell was recovered from alleyway 1, located between Structures 2 and 3. This narrow area was likely where trash was swept into from both work and living surfaces. The ten pieces recovered from this area were found in primary and secondary contexts, primarily on surface 1 of the alleyway and in the overlying collapse, which extended over 60 cm in depth. Of the 10 pieces of shell, only 2 were unworked, and both were fragments of conch columella. The other 8 pieces were worked and included 2 *Oliva* tinklers, 4 conch ornaments, 1 *Marginella* shell bead, and 1 shell pendant. The conch ornaments were shaped, incised, and polished

Table 9.3. Distribution of fauna by weight (g) in Special Deposit 1 at the Northeast Group

Class/order	Family	Genus and species	Weight (%)
Mammalia			38.51
Mammalia (small)			0.001
Mammalia (medium)			3.42
Mammalia (large)			1.11
Artiodactyla	Cervidae		21.59
Artiodactyla	Cervidae	*Mazama americana*	4.08
Artiodactyla	Cervidae	*Odocoileus virginianus*	11.09
Artiodactyla	Tayassuidae	*Tayassu tajacu*	12.33
Lagomorpha	Leporidae		0.03
Carnivora	Mustelidae		0.03
Rodentia	Sciuridae		0.03
Rodentia			0.18
Osteichthyes			0.21
Testudines			0.03
Animalia			7.37

into different shapes: one simple flat disc, two crenellated discs reminiscent of a sun, and an unusual shape possibly of a butterfly (see figure 13.6).

Fauna

Because of high soil acidity, faunal remains make up only a small percentage of materials recovered from excavations. At the Northeast Group, 611 fragments of faunal remains were identified, weighing little more than 400 g. Just over 99 percent of all faunal remains were recovered from NE-3 excavations, the majority from Special Deposit 1 (hearth deposit). In the fauna from this deposit, large mammals make up the majority of the assemblage, including 2 specimens of white-tail deer (*Odocoileus virginianus*), 1 brocket deer (*Mazama americana*), and 2 white-lipped peccaries (*Tayassu tajacu*). Other identified taxonomic groups include rabbit (Lagomorpha), bony fish (Osteichthyes), skunk (Mustelidae), squirrel (Sciuridae), and turtle (Testudines) (table 9.3).

Status and Commoner Identity

Given the neighborhood's association with terraces, residents were involved in daily activities focused in and around agricultural production.

While farming may have been the primary occupation of residents, at least two households, NE-1 and NE-3, engaged in practices and behaviors that distinguished them socially and physically from their neighbors.

Based on the differential distribution of ceramics, slate, obsidian, jade, shell, and animal bone, each of these two households appears to be the locus of distinct sets of activities, related directly to the control and centralization of neighborhood-wide social practices.

The identification of middens, serving wares, burials, ritual deposits, fauna, and worked shell suggests that the occupants of NE-3 were actively involved in ritual and activities linked to ancestor commemoration (Blackmore 2011). By burying the dead under their households, occupants created a connection between themselves and the distant past. While burials were identified at NE-1 and NE-6, they were fewer in number and spatially dispersed in comparison to those at NE-3. Burials emphasized the connection and dialogue between the living family members and their ancestors (Geller 2004: 286). This practice not only reinvigorated the community but also tied NE-3's living relatives to the land and their past (Barrett 1990; McAnany 1995). The density of material from this one group is more than we would expect from household-level activities. This material may indicate that occupants of NE-3 were practicing ritual and producing goods to be consumed physically and socially by their neighbors; these may have been acts used to sanctify and protect the neighborhood while simultaneously aggrandizing the identity and status of its practitioners.

The identification of the hearth deposit in association with midden 5 further supports this. The concentration of faunal bone within the hearth and the density of midden surrounding NE-3 force us to consider the role of food consumption by ritual participants. For the Classic period Maya, deer, peccary, turkey, and dog were common components of public festivals and feasts (LeCount 2001; see also Pohl and Feldman 1982). As a central component in ritual and religious activities worldwide, food is a powerful symbol of culture; it defines group identity and can reify societal norms. The relationships that define the order in which people eat, what they eat, who prepares food, and who eats with whom, among other practices, produce and reify socially defined identities. While the hearth itself is not indicative of feasting, other material indicators identified at NE-3, midden refuse and ceramic vessel forms, may be used to infer this specific form of ritual and social activity.

The recovery of marine shell similarly reflects a focus on ancestor commemoration. While the large majority of shell identified was ornamental, these pieces had important cosmological meaning. Conch and *Spondylus* are tied to the underworld and to notions of birth and fertility (Milbrath 1999: 119). The specific shapes of worked shell mimic Mesoamerican imagery related to wind jewels, items conceptually tied to the solar paradise of ancestors (Hill 1992; Mendieta 1980: 97; Taube 2007). Residents of NE-3 may have worn the pieces as ornamentation as a way of symbolically invoking their connection to the ancestors. More importantly, as long-distant trade items, the concentration of these materials at NE-3 links its occupants to larger social networks.

Ritual activity was not limited to the occupants of NE-3. Given the close proximity of this residence group to agricultural terraces, life at NE-1 may have been organized around the physical, social, and symbolic production of food. The particulars of ancestor commemoration practices, especially the deposition of mortuary goods and concentrations of slate and obsidian, suggest that NE-1 residents were invested in practices concerned with fertility and productive success. The caching and use of jade set residents apart from others in the neighborhood: "jade embodies the concept of life essence in Mesoamerican thought" and is closely associated with "wind, carrier of rain, and the essence of the life spirit" (Taube 2005: 30; see also Fields 1991; Freidel 1990; Miller and Taube 1993; Taube 2000). Its association with water and fertility may reinforce the group's association with agricultural rites. While obsidian and slate can be tied to ideology as well, these artifacts also reflect functional aspects of production and consumption. The sharpness of obsidian blades makes them useful, albeit delicate, tools for everyday chores. Aoyama's (1995) microwear analysis of obsidian blades from Copan demonstrates their use in a wide array of production activities, including hunting, agriculture, food processing, and shell and craft specializations. While everyone had access to obsidian, the concentration of these artifacts in midden 2 suggests that they were an important part of daily activities of the group.

Like obsidian, slate densities are much higher at midden 2 than elsewhere in the neighborhood. Slate is commonly used in the production of plaques and mirror backings, construction slabs, and tomb capstones, as well as other portable ornaments and sculpture (Braswell 1998; Healy et al. 1995). In the Belize Valley, slate is a local and easily accessible material and as such is common in archaeological assemblages. Perhaps the ubiquity of the material allowed residents to use it both as a ritual item and as an expedient source of tool material. When we look at the specific distribution of slate across the neighborhood, it is notable that NE-1 has five ornaments and six identifiable tools, including one side-notched pointed tool. In contrast, NE-3 contains only decorative items, including ornaments: one celt-shaped object and a possible plaque fragment.

The residents of the Northeast Group shared a common worldview, as indicated by the overlapping form and function of day-to-day practices. Differences in their scale and organization reflect that neighborhood residents were invested as well in the social prestige accorded to these acts. While the control and centralization of these activities would have played a significant role in establishing social authority, architecture and the organization of space would have further enhanced these positions. The distinctions among households discussed in the preceding pages are paralleled by differences in architecture and household arrangement. Based on architectural complexity alone, NE-1 and NE-3, while mutually different, are quite distinct from NE-6. The overall organization and size of buildings associated with NE-1 and NE-3 make these two groups stand out from other configurations in the neighborhood. The tallest structures in the neighborhood are located at NE-1 and NE-3. Structure 2 of NE-3 reached a height of 1.5 m. Survey data indicated that Structure 5 of NE-3 was of comparable height, but it was not excavated. The size of the structures would have differentiated residents, as they would have required larger investments of labor. In terms of spatial organization, NE-3 has a constricted arrangement, focused on the north–south alignment of Structures 1 and 2. The interior patio space of the group is much smaller when compared to those of other groups, in which patio space accounts for at least 50 percent of area. For NE-3, the focus is on the building and not the patio surface in between. Additionally, its structures are built on a clearly defined platform surface, approximately 1 m in height. In comparison, other group platforms are less than 1 m and incorporate natural outcrops of bedrock. For NE-3, this is not the case, as the structure retaining wall is clearly differentiated from the surrounding modern ground surface.

NE-1, in contrast, is dispersed spatially. The focus of the group is the two, three-mound groups connected by a single platform. As NE-1 is one of two groups founded in the Early Classic, a local version of the principle of first occupancy applies (Ashmore 1991; McAnany 1995): the longer a family has lived in an area, the larger and more elaborate a household group should be, both in construction sequences and in the number of structures. While NE-1 fits this model, NE-3 appears to be a focus of ancestor commemoration practices, often linked to a founding settlement, although it was founded several hundred years after NE-1. The occupants of NE-1 may have had ancestral ties to the land that they used to further legitimate their status within the neighborhood. As the principle of first occupancy focuses on ancestor veneration, why did occupants of NE-3 focus nearly exclusively on these types of practices? Although NE-3 was founded later than NE-1 (and NE-6), it was clearly the locus of these neighborhood-wide activities. This contradiction in settlement organization, ritual practice, and occupation suggests that status could be derived from more than a household's legitimate claim to the land. As the population increased in the Late Classic, residents of NE-3 may have manipulated the meaning invested in ancestor veneration as a way to claim more neighborhood resources.

Conclusion

If archaeological interpretations of ancient Maya society are based on the lives of the elite, then how can we accurately describe commoner populations, let alone ancient Maya society as a whole? This research challenges such misconceptions by focusing on social diversity within the confines of an ancient Maya commoner neighborhood. As Gailey and Patterson (1988) note, peripheral communities are impacted by state practices, particularly those that focus on the reorganization of kinship. This internal reorganization, then, creates opportunities for commoners to manipulate and define themselves in resistance to state-defined identities. While commoners constituted the farmers and laborers of ancient Maya society, their productive capacities did not limit who they were or their interactions within and outside of their communities. Rather than being considered redundant units of economic and social behavior, rural settlements are better contextualized as fluid social milieus. By exploring the relationships, behaviors, and identities of people living in the Northeast Group, we can begin to refine archaeological interpretations of social identity and give agency to commoners as active and fully cognizant participants of Maya society.

10

Organization of Chert Tool Economy during the Late and Terminal Classic Periods at Chan

Preliminary Thoughts Based upon Debitage Analyses

NICHOLAS F. HEARTH

The ancient Maya used chert tools to create the material culture hallmarks that define their civilization. They employed chert tools in many tasks such as quarrying cut-block limestone, cutting *milpas*, creating fill for architecture and roads, pulverizing limestone gravel for plaster, constructing agricultural terraces, preparing food, and other domestic tasks (Abrams 1994; Woods and Titmus 1996). For the residents of an agricultural community like Chan, chert tools were a daily necessity. To understand the ancient Maya's agriculturally based society (Whitmore and Turner 2001; Yeager and Robin 2004), we need to know how its tool economies operated.

The analysis of chert tool economies at Chan considers both household contexts across Chan where chert tools were produced and used for household-level provisioning and a specialized production household where bifaces were made for community-level exchanges. Middens at Chan were excavated at a range of households that represent the socioeconomic variability in types of households across the community. Analysis of chert tools and debitage (stone-tool production waste) from these middens allows exploration of how different households at Chan produced and used chert tools. The chert tool assemblages from these households include bifaces, flake tools, flake cores, and debitage.

During the 2002 Chan settlement survey (chapter 2), a dense chert debitage midden, unusual for household contexts at Chan, was identified approximately 1 km southeast of Chan's community center at household C-199 (see figure 1.2). Preliminary investigations in 2006 excavated eight

1 m by 1 m test units in the chert debitage midden and illustrated that the densest concentration of the midden extended over an area measuring at least 105 m^2 (Meierhoff 2006). The scale of production represented by this midden is between that of household-level production and the larger scale of regional production seen at sites like Colha (Hester and Shafer 1984). In 2009 I excavated portions of the architecture and the extramural areas in C-199 to explore the relationship between the residential buildings, the chert debitage midden, and the nature of the community-level production of chert tools at Chan (Hearth 2007, 2008).

The chert tool economy at Chan is quite complex and illustrates how its residents were enmeshed in webs of economic relationships. At the household level, all of Chan's households, regardless of wealth or status, produced and used flake tools. At the community level, chert bifaces were produced at one household, household C-199, for exchange across the community and possibly to other communities within the immediate area. Evidence of flake core production has been absent from Chan, potentially indicating that residents engaged in the regional economy to acquire these items.

Chert Tool Economies

Despite the importance of chert tools to the overall economy, the role of chert tool economies remains largely disarticulated from broader discussions of ancient Maya social organization. Likely the absence of discussions about utilitarian chert tools is a consequence of research questions focused on the development of social complexity vis-à-vis craft specialization for long-distance trade of portables like obsidian, jade, and basalt. Chert tool economies are often absent from publications examining regional ancient Maya economies (Garber 2004; Mathews and Morrison 2006) and even Mesoamerican lithic technology (Hirth 2003). This chapter explores three models that together allow us to understand the range of chert tool economies at Chan and the importance of different levels of economy in social organization.

Production intensity ranges along a continuum of difference in social and economic organization. Full-time craft specialization would yield the greatest quantity of goods (Braswell 2002; Brumfiel and Earle 1987; Santley and Kneebone 1993). The best-documented community in the Maya area that engaged in the full-time or nearly full-time production of chert tools is Colha in northern Belize (Hester and Shafer 1984, 1994; King 2000; Masson 2001; McAnany 1986, 1989; McAnany and Peterson 2004; McSwain 1991;

Roemer 1991; Shafer 1991; Hester and Shafer 1984, 1994). At Colha, various archaeologists have identified dense deposits of chert debitage across the community. Different households within the community specialized in a particular stage and type of reduction that linked household to household in the broader specialized production of chert tools. Exchange and trade then moved the tools to sites across northern Belize where they were used for various agriculture-related and nonagricultural tasks. The trade zone for utilitarian chert tools produced at Colha extended at least 60 km from the site, and numerous sites within this area were "consumers" of Colha chert tools (Hester and Shafer 1994: 55–58). The only artifact likely from Colha at Chan was a 38 cm long chert blade of honey-colored chert that was found in the grave of Late Preclassic Burial 10 (Novotny, ch. 12, this vol.). No other site with the extent of production as seen at Colha has been identified in the Maya area. Potentially "Colha-like" debitage middens exist at the site of El Pedernal in the Rio Azul region of Guatemala (Black 1987: 190), although this site has not been as extensively researched as Colha (see Buttles 2003 for the Colha bibliography).

At the other end of the production continuum is household production. Household production is the least intensive in terms of production output because the goods produced are used by only the household. Household level production of chert tools is widely documented across the Belize River valley (Ford and Olson 1989; Robin 1999; Stemp and Helmke 2008; VandenBosch 1999; VandenBosch et al. 2010; Willey et al. 1965: 411). The presence of household-level production of chert tools could be taken as evidence that chert tools were produced relatively redundantly within many agrarian households, thereby implying that these households were self-sufficient for their tool needs and were not integrated into broader economies of chert tool exchange. But for a household to be fully self-sufficient in terms of its stone tool production needs, it would have to independently quarry stone, perform the initial stages of reduction, perform finishing production steps, and resharpen tools. However, at the time when Gordon Willey and colleagues (1965: 411) inferred that the residents of Barton Ramie were self-sufficient in terms of their chert tool needs, the field of lithic technology was not developed enough to make any other assertion from debitage analyses.

Viewing household-level production of chert tools as indicating that certain households were not integrated into broader chert tool distribution networks is partly a function of methodological issues and partly a function of a lack of models that focus on how chert tool economies may work in smaller communities. Methodologically, lithicists working in the Maya area tend to generalize a singular chert tool economic strategy for a household or a community. Instead we need to realize that any household or community may have utilized a wide range of chert tool types, including flake tools and more formally produced bifaces and flake cores. Different chert tools may have been produced and exchanged in different manners. Rather than looking for a single economic model that can characterize the way a household or community related to broader chert tool distribution networks, we should focus on the potential for variation in how any household or community participated in a range of chert tool economies based on the different types of tools they used and tool-specific debitage produced (Shafer 1983).

In the Maya area, two models of the chert tool economy are common. A producer-consumer model is established by the Colha data in which a single site produced tools for consumers within a regional economy. A household self-sufficiency model is seen in the redundant production of chert tools at many small households within and between communities. These two models do not sufficiently describe potential variation in chert tool economies.

Situated between the producer-consumer model and the household self-sufficiency model is the village-level model, in which one or very few producers make tools for the immediate village or for local political powers. The village-level model bears similarity to the producer-consumer model in that craft specialization does exist; however, both the number of producers and the number of consumers in the village-level model are far fewer or even singular. Production occurs in one or very few households within a community, and within these households production occurs within spatially discrete structures.

These three levels of the chert tool economy are comparable to three general levels of economic activities that Payson Sheets (2000) identified at Cerén in El Salvador: residents produced some goods for household-level provisioning (the household economy), produced others for exchange within the community (the village economy), and obtained exotic objects from beyond their community (the regional economy). Most significant about Sheets's trilevel economic model is that households at Cerén participated in each level of the economy by making and exchanging goods within different economic structures.

In addition to the importance of including the third potential arrangement of the chert tool economy (the village-level economy), multiple kinds of economies could have been involved in tool production and use within a given region. For example, in Fedick's (1991) study of households at varying distance from the major centers of Tikal and Yaxha, he noted that although all households produced their own chert tools, in households closer to Tikal and Yaxha late-stage production flakes dominate, whereas in households that are more distant from these major centers, early-stage production flakes were present. Fedick interpreted this data to indicate that while all households were producing their own chert tools, households nearest Tikal and Yaxha had access to preformed tools that were finished, curated, and recycled in the household. They were both producers of their own tools and participating in a broader regional economy for the acquisition of preforms (also see Robin 1999: 485–87).

Methods

Lithic production is a reductive technology—that is, multiple pieces of debitage are removed to produce a single artifact. Analyzing the resultant debitage has been a useful means for archaeologists to explore how tools were produced (Crabtree 1968; Inizan et al. 1999; Whittaker 1994). Most analyses of chert debitage in the Maya area use morphological-metric analyses to elucidate the stage in the production process from which a flake originated (for example, Fedick 1991; Robin 1999; Stemp and Helmke 2008; VandenBosch 1999). Morphological-metric analyses measure the sizes of flakes while noting flake morphology such as platform characteristics or cortex.

Lithic analysts generally agree that during the initial stages of production, flakes tend to have a greater amount of cortex and fewer dorsal scars, prominent bulbs of percussion resulting from percussion flaking with large hard hammerstones, and natural and single-facet platforms. During the later stages of production, flakes tend to be smaller and thinner and have less cortex, greater numbers of dorsal scars, and multifaceted platforms. While all of this accurately generalizes the reduction process and allows researchers to grasp a general stage or stages of reduction present in an archaeological assemblage, morphological-metric debitage analyses do not elucidate what kinds of tools were made from a particular debitage assemblage, because they do not consider the different technologies (for example, biface production or flake core reduction), which produce distinctive types of debitage. Early- and late-stage production flakes are derived from the production of any tool; thus, by merely identifying early- and late-stage production, one cannot identify what particular types of tools were produced. While the flakes derived from the production of different types of tools may be similar in their morphological- and metric-based characteristics, they are quite distinct if one considers a flake's technological attributes, which are highly variable depending on the type of tool being produced (for an example, see Shafer 1983). Across the Maya area, multiple types of flake core production and bifacial production occurred; thus, technological analyses of debitage need to be undertaken to determine what tool types were being produced.

I base my analytic technique upon my firsthand knowledge of knapping and resultant debitage like other lithic technologists such as Clark (1988, 1997), Clark and Bryant (1997), Flenniken (1981), Wilke and Quintero (1994), and Woods and Titmus (1996). I categorize each flake piece by piece by the kind of tool or core that begat the flake. Technological studies of debitage require typing every piece of debitage by the material and technology used in flake removal. I use the analytical rubric in use at the Lithic Technology Laboratory of the University of California, Riverside. The variables of this rubric that allow us to understand the relationship between a flake and its parent rock and the technology used to produce it include the presence or absence of cortex, platform configuration, and the types of flakes that result from different knapping processes such as biface percussion and pressure flakes (both of which can be early and late), platform spalls, overshot flakes, erraillures, and others, to more general flake fragments and shatter. Every piece has technological characteristics; there is no nondiagnostic debitage in a technological analysis. With an understanding of these variables, we can determine the type of parent piece and reduction technique that begat a flake, which might be a biface, one of the variable types of flake cores (Hearth 2009), pressure blade cores (Clark and Bryant 1997; Hintzman 2000), or a bipolar technology (Flenniken 1981).

At Chan, biface and multiple types of flake core technologies were present. Early-stage biface debitage is generally more curved and would have either single-facet (SFP) or multifaceted platforms (MFP). Sometimes a small amount of cortex remains on flakes in this stage, though the singular presence of cortex is not directly attributable to early stages of biface reduction. In contrast to early stages of biface production, late-stage debitage would be less curved, as the biface has become flatter (which assumes that a flat biface was the intended end product), and platforms would have more complex faceting. Additionally, late-stage debitage would generally have more complicated dorsal scar patterns due to more flakes having been previously removed. Multifaceted platform flakes can also come from thick bifaces or from bifaces in early stages of production.

Multiple flake core technologies were also present at Chan (Hearth 2009). Flake core production and reduction yield different technological types of debitage than other types of tool production. The predominant kind of flake core was the single-facet, single-direction flake core. The platform for this core is made by the removal of a single flake. Knappers then use naturally occurring ridges in the material and the arrises from previous flake removals to aid the removal of flakes down the sides of the core. Flakes taken down the face of this technological type of core have simple, single-faceted platforms (SFP). The flakes show only one direction of removals on their outer surface. Debitage resulting from making flake cores of this type would be large completely cortical or partially cortical platform spalls and flakes removed with incorrect configuration for use as a flake tool. Arris-aligning flakes could also be present if straight arrises were needed to remove the intended flake from the core. Flakes used for tools would be removed from the face of the core, and they exhibit the same technological characteristics as the debitage taken off the face of the core. Flakes backed with cortex and steep noncortical edges can be created with this type of technology. Other flake core reduction strategies utilized at Chan have their own technologically distinctive debitage. Utilizing a technological analysis allows me to differentiate between the production and consumption of the various tool types produced and used at Chan.

Contexts at Chan

The household data used in this analysis derive from Late and Terminal Classic (AD 670–900) midden contexts at Chan. I analyzed debitage from seven households that represent the range of socioeconomic variability in households at Chan. Household C-304 excavated by Andrew Wyatt (chapter 4) and household C-251 (also referred to as CN1) excavated by Cynthia Robin (chapter 1; Robin 1999, 2002b) are both type 1 mound groups and represent the smallest farming households at Chan. Household C-003 is a type 6 mound group, the most elaborate household at Chan, where its leading families resided (Robin et al., ch. 7, this vol.). Between these two ends lie households C-154/155, C-156, C-157, and C-199. Household C-199 is a type 2 mound group located 1 km southeast of Chan's community center and is associated with a 105 m^2 debitage midden (Hearth 2007, 2008).

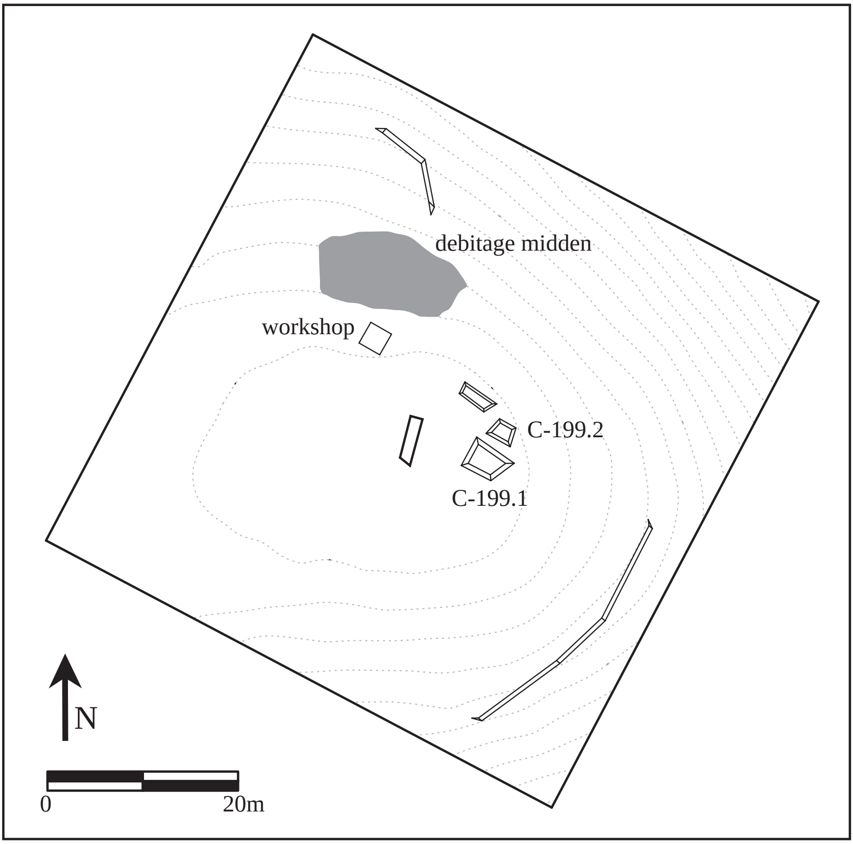

Figure 10.1. C-199 and associated workshop and debitage midden. One meter contour interval.

Households C-154/155, C-156, and C-157 were excavated by Chelsea Blackmore (chapter 9) and are situated 1 km east of Chan's community center in the Northeast Group. They are also referred to as NE-3, NE-2, and NE-1, respectively. Households C-156 and C-157 are type 4 mound groups. Blackmore identified that what was originally mapped as two mound groups in our survey (C-154, a type 5 mound group, and C-155, a type 4 mound group) was a single larger multifamily household.

Horizontal excavations were conducted at C-199 in 2009 (Hearth 2009). Ceramic analysis undertaken by Laura Kosakowsky (2009) indicates that C-199 was occupied during the Late and Terminal Classic periods. C-199 consists of multiple architectural components. The two adjacent structures that would have supported perishable buildings likely were the domestic quarters of the household (figure 10.1). Structure C-199.1 is comparable in size to the small perishable houses, and Structure C-199.2 is comparable in size to the small perishable ancillary structures inhabited by farmers (Blackmore, ch. 9, this vol.; Wyatt, ch. 4, this vol.; Robin 1999, 2002b) and stone quarriers (Kestle, ch. 11, this vol.) elsewhere at Chan. Additionally, two narrow linear features were located north and west of these structures to enclose a patio area. To the northwest of this patio group was a small ground-level cobble surface preliminarily identified as a workshop and the 105 m^2 debitage midden. The two domestic structures, two linear features, and debitage midden were identified during the survey of C-199 in 2002; the chert tool production area was identified only during the 2009 excavations that explored the extramural area between the C-199 architecture and the debitage midden. The chert tool production area measures 2.5 m by 2.5 m. It consists of a ground-level pavement of limestone cobbles and heavy amounts of debitage and microdebitage present within and between the cobbles. It is possible that a perishable roof or building existed over the cobble pavement. Few ceramics were identified in the area of the cobble pavement, but abundant chert debitage and debitage smaller than 1/8-inch mesh indicates that this area was likely a primary context where knapping occurred (Clark 1986, 1990, 1991b).

The identification of a chert production workshop in a house-lot at Chan is comparable to Sheets's (2002) identification of workshops in house-lots at Cerén. The C-199 house-lot and workshop is situated on a flat area in the topography, and chert producers discarded the debitage from their production to the north of the workshop, just off the edge of the area of flat terrain where they lived and worked.

Jim Meierhoff directed excavation of the chert debitage midden in 2006. Eight 1 m by 1 m test excavations identified that the densest concentration of chert debitage extends across an area measuring at least 105 m^2 and is 71 cm below ground surface at its deepest point. The midden contained 970,000 flakes per m^3 in its densest portions. Around 72 million flakes are likely represented by this midden. Given the density of flakes in the midden, all excavated matrix was bagged in the field and taken to the lab for flotation for 100 percent recovery of debitage.

Results

Table 10.1 simplifies the types of debitage identified at Chan into six broader categories. Analysis is still ongoing and therefore incomplete, but examina-

Table 10.1. Count and percent of chert debitage by household at Chan

Household	Single-facet platform flakes (SFP)	Multifacet platform flakes (MFP)	Core platform spalls and faceting flakes	Biface-related debitage (without MFP)	Biface-related debitage (with MFP)	Other (shatter, flake frags., etc.)
(N)	%	%	%	%	%	%
C-003						
(286)	26.92	6.64	0.35	0.00	6.64	59.44
C-154/5						
(665)	25.26	7.97	0.45	1.20	9.17	65.11
C-156						
(289)	29.07	10.03	0.69	1.04	11.07	59.17
C-157						
(147)	31.29	10.20	0.00	0.00	10.20	58.50
C-199						
(3098)[a]	5.23	29.31	0.48	6.20	35.51	23.27
C-251						
(1593)	19.15	16.26	0.63	1.57	17.83	44.57
C-304						
(109)	39.45	15.60	0.00	0.92	16.51	27.52

a. Includes test unit 29.B only. For comparative purposes, only debitage >1/4 inch is reported here. Total debitage count from 29.B is 47,026.

tion of the data from these seven households at Chan likely exemplifies the economies of the broader trends across the community.

Biface production is identified only at C-199. C-199 has a consistently higher percentage of debitage resulting from biface reduction than do other households. At C-199, 6.2 percent of flakes are biface-related debitage without multifaceted platform flakes and 35.51 percent are biface-related debitage with multifaceted platform flakes. Multifaceted platform flakes would be expected from the production of thick bifaces like axes, the common bifacial tool used in agricultural work at Chan. C-199 also has the highest percentage of general multifaceted platform flakes of any household at

Chan. These flakes likely derived from biface production, though they were not directly attributable to biface production, because one technological characteristic, such as the proper proximal to distal curvature, platform complexity, and dorsal scars consistent with flake removal from a biface, was not present. Proximal to distal curvature and dorsal scars consistent with flake removal from a biface would be absent if thickness of the finished biface was a desired trait. In many instances during analysis these flakes were too short or were broken and the proximal to distal curvature was lost or unclear. Furthermore, many flakes would not extend past the midline of the biface, as flakes that would extend far would effectively thin the biface. These flakes would not capture the dorsal scars and undulations indicative of biface manufacture, though they were derived from a biface.

Flakes off of bifaces are evident from other households, which implies that not all knapping of bifaces occurred at C-199. However, the biface-related debitage at other households is a lower percentage of the assemblage than at C-199. The flakes from bifaces in these contexts could derive from biface resharpening, although it is difficult to identify resharpening with a high degree of certainty. All of the flakes included in this analysis have heavy patination through chemical weathering. This patination obscures any silica or hoe polish on the dorsal surfaces of flakes removed to re-sharpen a dull, utilized biface.

Flake reduction from flake cores occurred in every household examined as both single-facet flakes and platform maintenance debitage are evident in all households. The highest percentage of these flakes consists of single-facet platform flakes. These are the flakes produced from single-facet-platform, single-direction flake cores although they could also come from single-direction, multifaceted flake cores as long as the cores had large platform facets that would yield single faceted platform flakes. In terms of flake production from flake cores, C-199 also has the lowest percentage of single-facet platform flakes, thereby indicating the debitage assemblage was different than that of the other households in question, as the knapping that occurred there was related to its biface production.

There is no strong evidence that flake core production itself took place in any of Chan's households. Evidence of the production of single-facet, single-direction flake cores would consist of large flakes that establish striking platforms, and production failures. Both of these products could be recycled into flake blanks for bifaces and other types of flake cores. Therefore, it is difficult to identify the production flake cores with any certainty.

However, the lack of evidence of flake core production suggests that cores were made elsewhere and then brought into Chan or that their production location at Chan has yet to be identified.

Discussion and Implications

At Chan, the production of chert bifaces, flake tools, and flake cores was organized differently. No single model sufficiently describes tool production at the community or within individual households. The residents of C-199 produced thick bifaces likely to be used as axes. They produced these tools in larger quantities than they needed for use within their household. Nothing about the architecture or agricultural terraces at C-199 necessitated a larger number of bifaces than other households of the same size. No complete bifaces were recovered from excavations at C-199, further indicating that the household was a workshop (Clark 1990). Therefore, the residents of C-199 likely practiced a low level of occupational specialization. Other households at Chan, regardless of status, likely acquired their bifaces from C-199 and resharpened them within their homes, as evidenced by the comparatively lower quantities of biface production flakes from other households. People at Chan likely used these bifaces in agricultural work (Wyatt, ch. 4, this vol.), to cut trees (Lentz et al., ch. 5, this vol.), and to quarry limestone (Kestle, ch. 11, this vol.).

In comparison to biface production, people in all households reduced flake cores for flake tools, though no strong evidence of flake core production exists in any household. All households may have participated in the broader regional economy to acquire flake cores, or there may be production locations for these cores at Chan that have yet to be identified. These flake cores would have been brought into the site with the core configured for flake removal. Every household at Chan produced flakes from flake cores, and many had flake tools; thus, the flake tool economy at Chan was organized for household-level provisioning, or in other words, each household was likely self-sufficient in their production of flake tools. Households' self-sufficiency in terms of flake tool production does not imply that they were self-sufficient in terms of all chert tool economies. Flake cores may have come from beyond Chan, linking residents to broader chert tool economies. Alternatively, their production location at Chan has yet to be identified or the evidence of their production was recycled into other goods. Households also used bifaces that they acquired from C-199. In general, these data correspond with McAnany's (2004b) assertion that a completely self-sufficiency model for ancient Maya households is no longer viable in the Maya area.

My findings contrast with and are similar to previous research into the chert tool economy at Chan by Jon VandenBosch (1999; VandenBosch et al. 2010). VandenBosch conducted a regional analysis of chert tool economies in the vicinity of Xunantunich. He excavated test units at 28 households identified along two 400 m wide transects that extended from Xunantunich. One transect extended west of Xunantunich and included the settlement areas of Succotz, Chan, and Dos Chombitos, and the other extended north of Xunantunich and included the settlement areas of Actuncan and Callar Creek. Because he was particularly interested in understanding chert tool economies among the lowest tier of Maya society, all of the households in his study were type 1, 2, and 3 mound groups. Eight of the households in his study were located within the Chan community.

VandenBosch argued that households within the Chan community were autonomous from each other in terms of the chert tool economy because he observed a great uniformity in the flakes recovered from the households he tested. But because he conducted a morphological-metric analysis, rather than a technological analysis based on firsthand knowledge of stone knapping, he was unable to identify what tools were being made. The analysis that I present in this chapter does indicate a high degree of uniformity in flake tool production at Chan households in my sample if the materials from C-199 are excluded from the sample.

VandenBosch's morphological-metric-based analysis was unable to differentiate between the following two scenarios: that Chan's households produced all of their tools themselves or that they were producing a particular set of tools themselves and acquiring other tools from elsewhere. As well, his sampling strategy was regionally based, not community based; thus, his findings are best understood at a regional rather than community-specific level. The households he investigated on the transects were part of communities that extended beyond the reach of the transects, and any variability in the broader communities that lay beyond the boundaries of the transect could not be assessed at the time of his study. Household C-199 was not part of his study.

Cynthia Robin (1999) for her dissertation explored seven type 1 and 2 mound groups (one of which, C-251/CN1, is included in my sample) at the Chan Nòohol neighborhood located south of Chan's community center. She undertook a morphological-metric analysis similar to that of VandenBosch and comparably found that the Chan Nòohol households were producing their own tools. She also explored the proportions of early- and late-stage production flakes at the Chan Nòohol households and identified that late-stage production flakes formed the majority of the flakes identified at these households (Robin 1999: table 147). Drawing upon the work of Fedick (1991) discussed earlier and differing from VandenBosch, she argued that the residents of Chan Nòohol acquired preforms through exchange from which they produced their tools, indicating that they were both producing tools for their own provisioning and participating in broader chert tool economies. But because she, like VandenBosch, used a morphological-metric analysis, she was unable to identify what tools were being produced and what types of performs were being brought into these households.

My technologically based analysis corroborates some aspects of VandenBosch's (1999) study: all of Chan's households from its humblest farmer to community leader were producing flake tools from flake cores redundantly for their own provisioning. But this does not imply, as VandenBosch argues, that Chan's households were self-sufficient in terms of the total economy of chert tools. Chan's households were also acquiring bifaces produced at household C-199, and all households were acquiring their flake cores from beyond the community or a location yet to be identified at Chan.

Conclusion

At Chan we can see that the chert tool economy of a single community, or even a single household, cannot be characterized by a singular model of economic production (compare McAnany 2004b: 145). The residents of Chan produced a range of different tools, and they organized the economies of different tool types on distinct levels of economic integration. At Chan, a single occupationally specialized household, C-199, produced thick bifaces, likely axes, for exchange across the community. The village-level economy of chert tools is the least explored level of chert tool economies in the Maya area. Currently a number of other examples of potential village level production have been identified in the Maya area, including Succotz (VandenBosch 1999; VandenBosch et al. 2010), El Pilar (Ford and Olson 1989; Whittaker et al. 2009), Yaxox (Ford and Olson 1989; S. Fedick, personal communication), in the Rio Azul Region, and in Guatemala (Black 1987), among others.

All of Chan's households produced their own flakes and flake tools from flake cores. Households predominantly used single-faceted flake cores for flake production. As there is no evidence for flake core production in any of Chan's households, these cores were likely attained by households from beyond the community or an area yet to be identified within the community.

The technological analysis of chert debitage at Chan allowed identification of the different types of tools from which flakes were produced. The significance of a technological approach is not purely methodological, because it enables us to examine the possibility that either people made different tools in different locations or they made the same tools in all locations. Examining these possibilities distinguishes between a household that would be self-sufficient in terms of all of the tools that it used and a household that is self-sufficient for some of the tools that it used though it acquired other tools from elsewhere. This is a crucial distinction for lithic analysts to make, because the self-sufficiency and integration of households within communities and communities within the broader society are central issues in the study of social complexity.

11

Limestone Quarrying and Household Organization at Chan

CALEB KESTLE

Quarries are a common feature of the Maya landscape and have been widely noted in archaeological investigations (Beekman 1992; Sweely 2005; Weiss-Krejci and Sabbas 2002; Graham 1994; Scarborough 1991; Sharer and Sedat 1987; Folan 1977, 1982). Perhaps the clearest significance of Maya quarries is that the materials produced there were used to construct the grand monuments and architecture for which the Maya are renowned. Following this observation, archaeological interpretations of Maya quarrying have focused on understanding the relationship between quarries and the monuments and architecture created from quarried materials. Some authors have attempted to acquire volumetric data on the quarries and/or surrounding architecture (Beekman 1992; Scarborough 1991; Folan 1977, 1982). Other authors have extrapolated the techniques used in quarrying (Beekman 1992; Folan 1977, 1982). These studies advance our understanding of Maya labor practices and technological abilities; however, they tend to view the act of quarrying as epiphenomenal to the creation of monumental architecture. The current research explores quarries themselves and the activities that went on in quarries as contexts and locations of social action. Quarries provided the building material not only for monumental centers but also for every aspect of constructing the Maya landscape, from simple houses to palaces, agricultural terraces, roads, reservoirs, and temples. A social analysis of quarrying shows how these locations were more than pits dug into the ground or ledges carved along hillslopes from which stone was extracted. Quarries were places where people negotiated relationships of production and consumption. They were central arenas for economic activities and exchanges.

This chapter explores the relationship between technology and social organization as it is exhibited in the practice of limestone quarrying at Chan during the Late and Terminal Classic periods (AD 600–900). At Chan, quarries were identified across the community, with the largest concentration and greatest extent of quarries located adjacent to the community center. One season (2006) of horizontal excavations of limestone quarries and associated households north of and adjacent to the community center provided detailed insights into the technological and social organization of limestone quarrying at Chan (see figure 1.2; Kestle 2006). Patterns observed from household and quarry excavations are further compared to regional ethnographic, ethnohistoric, and archaeological data on quarrying. By considering location, quarrying techniques, material preferences, and tool distributions, inferences can be made about the social organization of limestone quarrying technologies.

Quarries and Household Social and Economic Organization

At Chan, quarries were always located adjacent to households and architecture. At one level, this association makes intuitive sense—quarried materials were used to build these places. But at another level, this association prompts us to ask the question: what was the relationship between the productive activities going on in quarries and the organization of adjacent households? The Chan data asks us to query the relationship between quarrying activities and the household organization of labor. Households can be defined as minimal social units of production and consumption (Wilk and Ashmore 1988; Hendon 2004; Robin 2003). This emphasis on production and consumption situates the household in the larger context of craft specialization and regional economics, respectively.

As others have noted, previous scholarship in the Maya area (and elsewhere) has tended to focus on elite, intersite exchange and full-time craft specialization (for example, Feinman et al. 2002; Robin 2003; Sheets 2000). Though this approach can assess top-down and regional exchange networks, it focuses our understanding of the complexity of Maya exchange on that garnered from elite writings and the trade of exotic goods. Top-down approaches have a tendency to reduce agricultural communities to passive producers locked in relationships of dependence. In many ways, this resembles dependency theory and to some extent its academic offspring, world-systems theory (Wallerstein 1974). Politically dominant centers are viewed as the places where production for the political economy occurs, whereas hinterlands are conceived of as places in which only raw materials, such as labor or agricultural produce, are produced.

However, in more recent years there has been a greater fine-tuning of our understanding of the Maya world and its trade and exchange networks. New approaches, particularly those developed within the field of household archaeology, have given us paradigms through which we can add the complexities of intrasite exchange, commoner production and consumption, and the role of utilitarian goods to our models to create a more complete picture of the Maya world. One such paradigm, developed by Sheets (2000) based upon his observations of the well-preserved households of Cerén, identifies three spheres of exchange:

> (1) Household members produce many items for intrahousehold use, including architecture, food, and some artifacts with no input from the outside. (2) Each household produces some commodity in excess of what they needed for their internal consumption, by means of part time specialization, and they use this for exchange with other households within the village or nearby. This is termed the horizontal or village economy. . . . (3) Each household obtained distant exotic items, such as obsidian tools, jade axes, and polychrome serving ceramics, by exchanging their household surplus commodities in elite centers. In this paper this is called the vertical economy.

Understanding that households, particularly commoner households, may participate in three levels of economies—(1) the household economy, economic production for the household; (2) the village or horizontal economy, economic production for the community; and (3) the regional economy, economic production for exchange with elite centers—illustrates the complexity of economic interactions and the varied roles that households may play in broader economies. This also allows us to see that the heterogeneity of household assemblages identifiable in the archaeological record can be the product not only of external exchange with larger polities (as in the top-down approach) but also of internal economic activity with households and communities (for example, Hirth 1996; Sheets 2000).

From this perspective, we can see that when farming communities limit their dependence on centers for everyday items they are not only taking practical measures but are also engaging in political action. As Falconer (1995) has noted, "peasant" communities will often organize their labor and exchange networks to promote their long-term viability. This is similar to what Eric Wolf (1955) called the "closed community," but rather than seeing the closed community as simply a community that reacts to centers by drawing upon its internal labor and production, as Falconer points out, the organization of internal labor and exchange can be a promotional strategy developed by communities themselves. Fostering economic independence is something that major civic-centers may do as well (Wolf 1955). In both cases, the promotion of a group's internal economic viability is a mechanism of buffering against the ebbs and flows of politically or environmentally unstable systems. Indeed, from what we can discern of the end of the Classic period, political instability was common. Particularly relevant to the Chan study is that the polity capital of Xunantunich had a relatively late and short-lived florescence in the late Late Classic period and went through a period of rapid demise in the Terminal Classic period (LeCount and Yaeger 2010; Leventhal and Ashmore 2004). As Chan's quarries and associated households were continuously occupied from the Late to Terminal Classic period, understanding their economic organization can provide insight into the survival of the Terminal Classic community at Chan, which would have been reliant in part on its ability to participate in larger economic networks while simultaneously maintaining internal economic stability.

If we apply a multilevel economic model to the limestone quarries and associated households at Chan, we can better interpret what might otherwise have seemed like a mundane activity—limestone quarrying—that might seem to lack in social and economic complexity. Rather than viewing the quarries as simply a source of stone, we can attempt to interpret the place of these quarries in the larger economic system of the Chan community and the households associated with quarrying activities.

The Limestone Quarries at Chan

Ten quarry areas were identified and mapped during the 2002 and 2003 survey work at Chan (figure 11.1). The 2006 season mapped an additional quarry area north of the Chan Central Group. Examination of the location of the limestone quarries at Chan reveals several interesting features. First, we can see that limestone quarrying faces are predominantly located in the central area of the community adjacent to the main areas of largest architectural construction projects. Second, the Chan quarries tend to be on hilltops and steep hillsides.

To explore the nature of limestone quarrying and household organization at Chan, horizontal excavations (Operation 28) were undertaken in

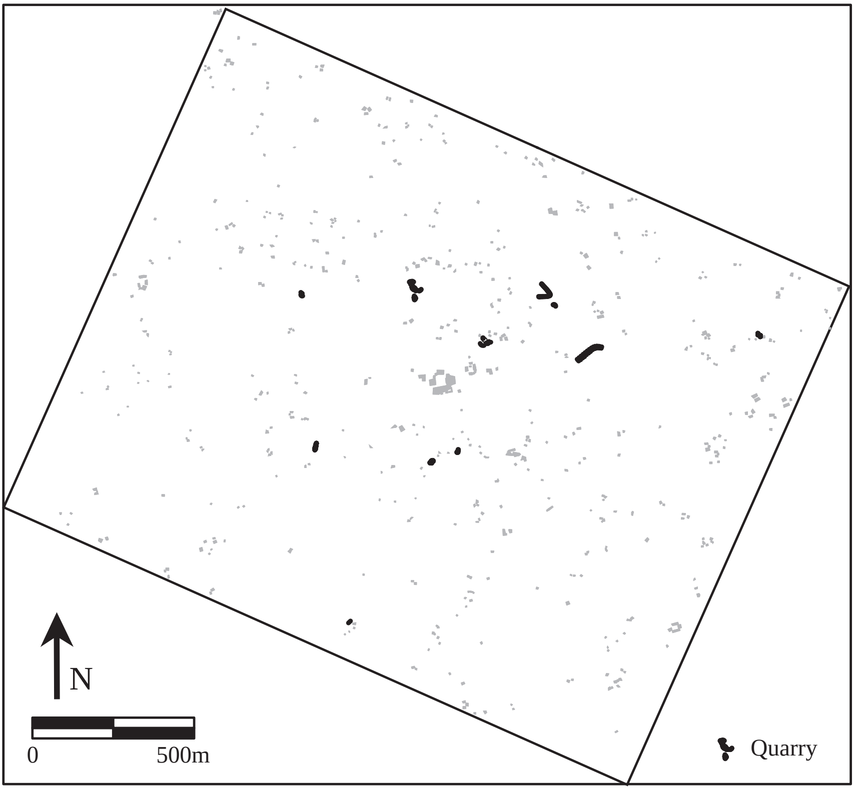

Figure 11.1. Quarry locations at Chan.

2006 at a concentration of quarries and agricultural terraces adjacent to households C-010 and C-011 located 70 m north of Chan's Central Group (figure 11.2; Kestle 2006). The quarry area consisted of five quarry faces extending across a 70 m by 45 m area situated on terraced terrain. Within this area, four quarry faces were selected for excavation: quarries A, B, C, and D. Quarry A measures 12.7 m along its exposed face. It is located on a slope and consists of a hard tabular limestone (figure 11.3, left image). Quarry B is a semicircular pit approximately 3 m in diameter; this feature had a late agricultural terrace constructed over it and was only exposed upslope of the terrace. Quarry C is another semicircular exposure; this feature is located on a hill slope and is 2.44 m in diameter (figure 11.3, right image). Quarry D is located on a hilltop; this feature is approximately 5.44 m long and is deeply cut into the naturally eroded bedrock. Quarries B, C, and D all consist of the naturally eroding soft white limestone.

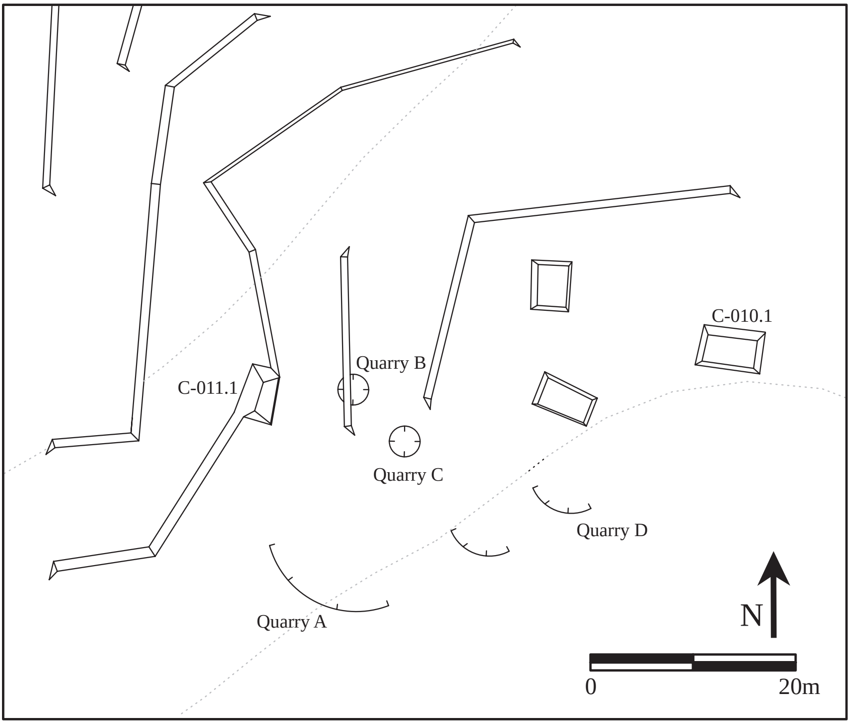

Figure 11.2. Operation 28 quarries, households, and terraces.

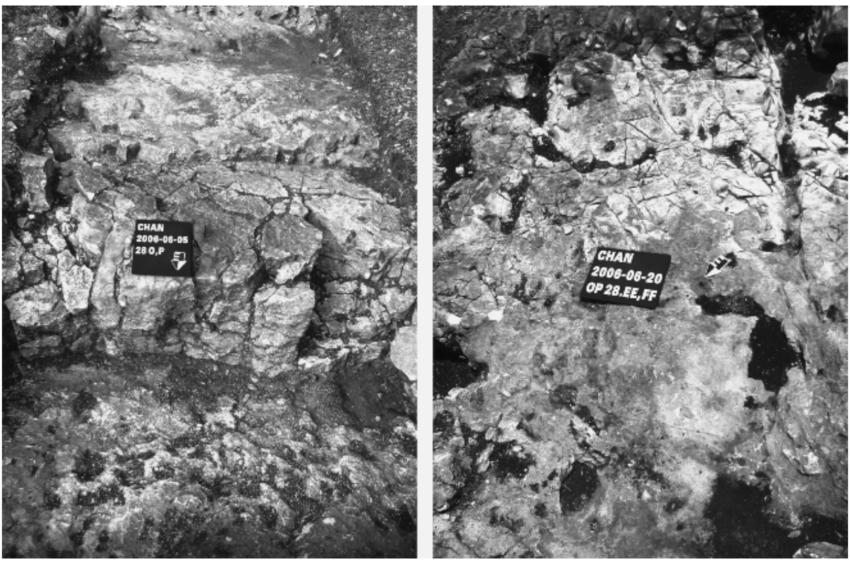

Figure 11.3. Hard tabular limestone quarry A (*left*) and naturally eroding soft limestone quarry C (*right*). (Photographs by Caleb Kestle.)

Household C-010 is a type 3 mound group in the Chan settlement typology (see chapter 2). It comprises three low house mounds, two of which were adjoined by a patio area. Household C-011 is a type 1 mound group. It consists of a single low house mound. Household excavations included horizontal excavations of two of these four mounds—Structures C-010.1 and C-011.1, a test unit in the approximate center of the patio area at household C-010, and a trench across the agricultural terrace adjoining Structure C-011.1.

Households C-010 and C-011

Structure C010.1 was constructed in two phases. A structure with an elevated area (or bench) in its southwest portion was initially constructed over bedrock. In a second phase of construction, the structure was raised to a level height (figure 11.4).

Ceramics indicate that Structure C010-1 was constructed during the late Late Classic to Terminal Classic period (Kosakowsky 2008). Recovery of a range of ceramic forms, chert tools and debitage (including 12 thick chert bifaces), and ground stone metate pieces indicate that Structure C-010.1 was a part of a domestic unit comparable to other small domestic units at Chan (see Hearth, ch. 10, this vol.; Robin, ch. 1, this vol.; Wyatt, ch. 4, this vol.). Also associated with this structure were three obsidian blade fragments and one *Strombus adorno*. As obsidian and marine shell are not available at Chan, the residents of Structure C-010.1 had access to a wider economic or exchange network.

Structure C-011.1 was originally built as a low single-level structure over a preexisting terrace. It had a small bench in its western portion. In the second phase of construction, this bench and structure were turned into inset steps with an L-shaped structure surrounding it. The final phase of construction was an extension of the L-shaped structure (figure 11.5).

Ceramics indicate that Structure C-011.1 was first erected during the early Late Classic period; however, subsequent remodeling occurred during the late Late Classic and Terminal Classic (Kosakowsky 2008). Recovery of a range of ceramic forms, chert tools and debitage (including two thick chert bifaces), ground stone mano and metate pieces, two spindle whorls, and one bark beater indicates that Structure C-011.1 was a part of a domestic unit comparable to other small domestic units at Chan. In addition to these items, long-distance trade materials were also recovered, including obsidian, slate, two serpentine artifacts, and marine shell (one

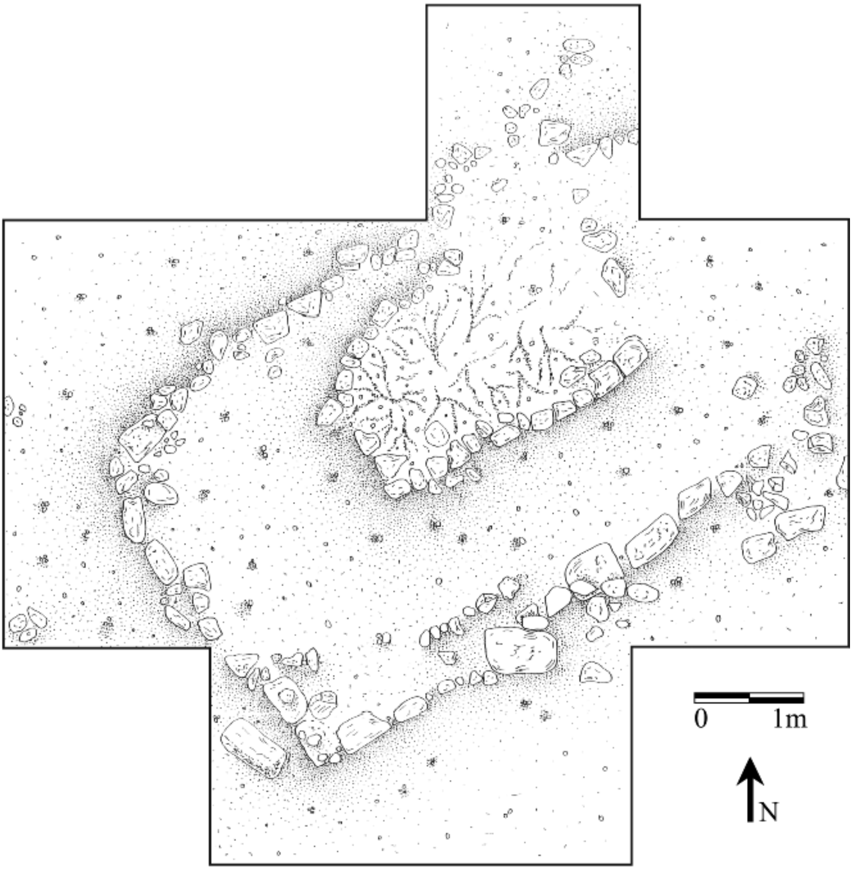

Figure 11.4. Plan of house C-010.1. (Illustration by Nasario Puc.)

Strombus sp. adorno and two *Strombus* sp. beads). These artifacts indicate that the residents of Structure C-011.1 were capable of producing the surpluses necessary to engage in a larger regional economy.

The terrace adjoining Structure C-011.1 was excavated to establish a relative chronology for its construction. The terrace was constructed in one phase. Its construction began with the land being cleared down to a level of naturally occurring reddish clay. A retaining wall of larger informal stones was built over the reddish clay, and the area upslope of this wall was filled with rubble and soil. The ceramics recovered in the fill of the retaining wall indicate a late Late Classic to Terminal Classic date of construction (Kosakowsky 2008).

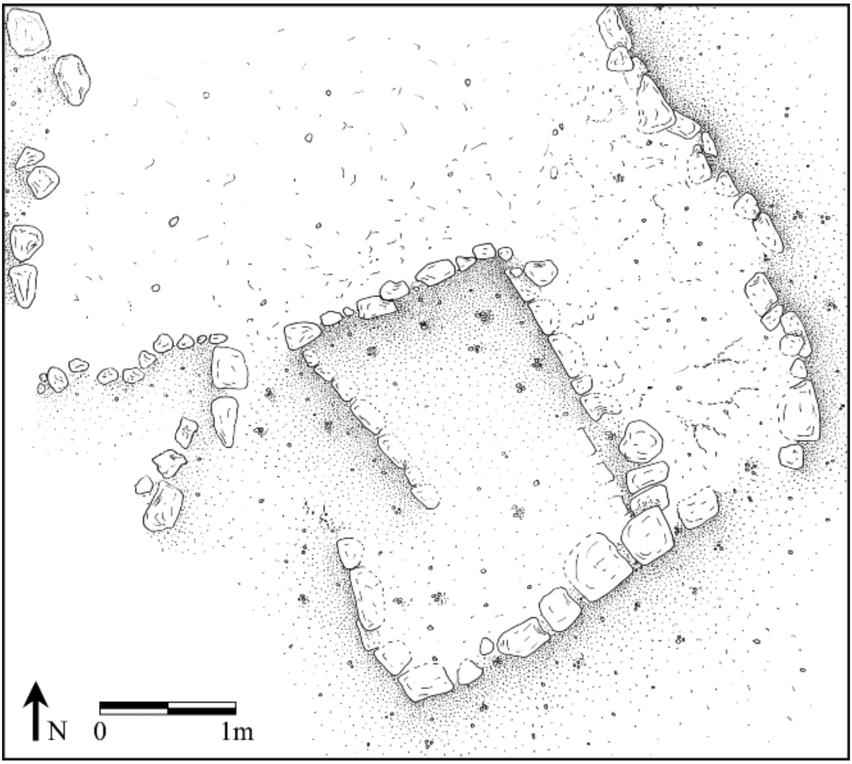

Figure 11.5. Plan of house C-011.1. (Illustration by Nasario Puc.)

Thick chert bifaces were found in higher densities at Structure C010-1 than at Structure C011-1, but they were smaller broken fragments of bifaces when compared to those associated with Structure C-011.1 (table 11.1). Thick chert bifaces, such as those identified at C010-1 and C-011-1, as well as on terraces and in quarries, can be used for a variety of activities that would involve adzes and picklike tools. They are a primary agricultural implement used at Chan (Hearth, ch. 10, this vol.). They are also commonly employed in quarrying (Cook 1973; Hayden 1987). Although the form of a thick chert biface does not indicate if it was used as an agricultural tool or a quarrying tool, I demonstrate in this chapter that by looking at the density, condition, and context of these tools in households, agricultural terraces, and quarries we can suggest functional designations.

Table 11.1. Distribution of thick chert bifaces at quarries, households, and terraces

	Number of thick bifaces *N*	Total weight of thick bifaces grams	Volume of excavations m^3	Density of thick bifaces per m^3	Average biface weight grams
Str. C-010.1	12	1127.2	5.32	2.26	93.93
Str. C-011.1	2	986	4.66	0.43	493
Quarry A	0	0	4.54	0	0
Quarry B	1	44.4	1.88	0.53	44.4
Quarry C	0	0	0.84	0	0
Quarry D[a]	3	0	0.92	0	0
Terrace	1	203.8	3.84	0.26	203.8

a. Two informal siliceous limestone picks were identified on quarry D.

Quarry Excavations

Four different quarry faces were excavated in Operation 28. Two of the excavated quarries were located on hilltops; both of these were of the soft-weathered type of limestone (quarries B and D). The other two quarries were located on hillslopes: one of these was hard tabular limestone (quarry A), and the other was the soft weathered variety (quarry C).

Quarry A was located at the only distinct outcropping of hard tabular limestone in the Operation 28 area. This quarry was excavated in five contiguous 2 m by 2 m excavations. These excavations recovered low densities of artifacts and included no thick bifaces or other kinds of quarrying tools. High densities of burnt limestone were identified (table 11.2). This evidence suggests that fire cracking quarrying techniques might have been the primary method of removing stone from quarry A.

Quarry B was located on a hilltop outcropping of soft limestone. This outcropping was excavated in two contiguous 1 m by 2 m excavations. The purpose of these excavations was to bisect the quarry area. Excavations recovered one thick biface (table 11.1). Burnt limestone was also recovered in quarry B but at a much lower density than other quarries (table 11.2). The presence of a quarrying tool and the lower density of burnt limestone suggest that quarry B might have been quarried differently than quarry A.

Quarry C was also a soft limestone quarry, like quarry B, but it was located on a hillside, like quarry A. This quarry was excavated in two contiguous 1 m by 2 m excavations that followed the general slope of the quarry. Unlike the other quarries, this quarry had a terrace constructed over it. The quarry face had no associated tools and had moderate densities of burnt limestone (table 11.2). The reuse of this area through the construction of a

Table 11.2. Distribution of burnt limestone at Chan quarries

	Type	Location	Volume of excavations m^3	Weight of burnt limestone grams	Density of burnt limestone per m^3
Quarry A	Tabular	Hillside	4.54	1,907	420.044
Quarry B	Weathered	Hilltop	0.84	3.5	4.167
Quarry C	Weathered	Hillside	1.88	112	59.574
Quarry D	Weathered	Hilltop	0.92	77	83.696

terrace makes it difficult to assess whether this quarry was used in a manner more similar to quarry A or quarry B. This quarry may have been cleared of tools when the fill for the terrace was deposited, and the burnt limestone might have been redeposited as part of that fill episode. Because of the unique depositional processes occurring on quarry C, this quarry will be given less consideration than the other three quarries.

Quarry D was a hilltop quarry like quarry B. This quarry also consisted of the soft, easily crumbled type of stone. It was excavated in one 2 m by 2 m excavation. Quarry D seemed to have been cut as a pit into the hilltop and was used to remove eroded stone. Artifacts recovered from this quarry included two informal siliceous limestone picks. In addition to these artifacts, burnt limestone was also recovered on this quarry (table 11.2). Quarry D resembles quarry B with regard to recovered artifacts, location, and presence of burnt limestone.

Household and Quarry Excavations

From the excavation data we can discern two important points. First, the two excavated mounds were of comparable size and were part of small household domestic units. They were both equidistant from sets of agricultural terraces and limestone quarries. But they each had access to a different range of exotic items and had different amounts and conditions of the primary formal tool type identified at Chan: thick chert bifaces (which could be used as adzes or picklike tools). The other important observation is that there are two different patterns of artifact and burnt limestone deposition among the quarries. The quarry that consisted of hard tabular limestone had the most charred limestone but no actual stone artifacts associated with quarrying. The quarries that consisted of soft limestone tended to be associated with fragmentary thick chert bifaces and informal siliceous limestone picks and had less charred limestone (tables 11.1 and 11.2). These two patterns may seem incidental, but when we consider ethnographic examples of quarrying, these observations actually tell us a great deal about how labor was organized in quarrying at the Chan community and at households C-010 and C-011.

Ethnohistoric Data

When we consider the Chan data, there are four observations that resonate with ethnographic data and can inform our understanding of the economic configuration of quarrying at Chan. The first is the general locations of types of quarries. Second, some quarries have associated artifacts, while others do not. Third, different kinds of artifacts are found on both quarry faces and in associated house mounds. Fourth, different amounts of charred limestone are found on the two types of quarries (hard tabular and soft limestone quarries). These all vary in ethnographic contexts, and as they vary, they seem to correlate with different methods of organizing labor. Moreover, these methods of organizing labor also seem to correlate with the intended uses of the produced materials.

The location of quarry faces is an important factor in establishing different kinds of labor organization. In much of the ethnographic literature, quarries are not located in habitation areas but are out away from towns (Nelson 1987; Hayden 1987; Cook 1982). Although these quarries are dispersed away from habitation areas, landownership is a significant factor in how labor is organized in a quarry. In many ethnographic cases, quarry faces are owned by individuals as parts of larger landholdings, and in these cases individual quarriers "lease" access to these quarries (Cook 1973, 1982; Hayden 1987). In other cases quarries are owned as communal land or parts of *ejidos* (Hayden 1987; Nelson 1987). However, despite this fact they are still parceled off and rented to private individuals. In either case, access to quarries is restricted to individuals who pay for the right to use them.

This tendency toward restricted access seems to be related to labor. Restricting access means that individuals must be organized into teams under quarry heads. These heads generally pay workers in portions of the stone acquired through the group's organized effort (Cook 1973, 1982). As some older quarrymen have noted, the practice of quarrying stone used to require large teams, and they had to concentrate their efforts as a group (Cook 1973, 1982). Under these circumstances, people had to work under a quarry head, but the head could only successfully quarry as long as people would work.

However, this control of quarry access is not the only way quarry labor can be organized. Many of the above cited studies focus on stone used in the creation of metates. The stone used to manufacture metates had to have several intrinsic qualities, all of which were recognized by quarriers as necessary (Cook 1973; Hayden 1987). However, in at least one study, soft, easily quarried marl was conceived of as publicly owned (Cook 1982; see also Beekman 1992; Folan 1982). This stone, generally used in road construction and as construction fill, is soft and easily removed by an individual with nonspecialized tools. Also, this stone is generally quarried in areas adjacent to the places where it is consumed, or the building project it will be used to create.

Thus, there seems to be a link between the locations of quarries and the kind of labor organized to exploit them. Quarries located near the architecture they were used to build were often used informally by anyone, whereas quarries containing stone with sought-after qualities had access restricted through some form of ownership or rent, and these quarries were not directly associated with the places where their stone was used. It should be noted, however, that the finished stone products from these quarries eventually ended up as regular parts of local material culture.

In the ethnographic literature, a stone quarrying tool's location and type are both related to different methods of organizing labor. The types of stone tools associated with quarrying can be either formal or informal. Formal tools often include large hafted mauls, varied sizes of "picks," and adzes (Cook 1973). These tools are often made of harder stone, or in some cases metal (Cook 1973). Regardless of the material, these formal tools tend to be the property of individuals who store them in their houses (Cook 1982). When these tools are used, they are often supplied to quarry crews by the individual who has access to the quarry. Informal tools tend to be made on-site and cached at the quarry site (Cook 1982; Hayden 1987; Nelson 1987). The forms of these tools are generally picklike, and they can be identified by retouch and the stone plaque that develops on them from use (Hayden 1987). Informal tools will sometimes be used alongside formal ones (Hayden 1987; Cook 1973) but they are only stored at the quarrier's residence if the informal tool is a particularly good one (Hayden 1987). Formal and informal tools are not just two different kinds of tools; they are distinguished by the locations where they are stored.

Different patterns of tool storage reflect different methods of organizing labor. Specialized tools are often associated with individuals who organize labor (Cook 1973, 1982), whereas informal tools are used by quarriers who work individually (Hayden 1987; Cook 1982). The former class of tools tends to be stored in the homes or workshops of their owners, but the latter will often be stored near the actual quarry faces. This is in part because individuals who work alone must minimize the amount of weight they carry in order to bring back the most workable stone (Binford and O'Connell 1984; Hayden 1987; Weiss-Krejci and Sabbas 2002; Beekman 1992; Folan 1977, 1982; Graham 1994; Scarborough 1991). Likewise, formal tools owned by quarriers who work individually will also have a tendency to be stored near quarries, generally in well-hidden caches (Hayden 1987). This means that although quarriers who are organized in teams will have some informal tools, their assemblages can be distinguished from quarriers who work individually, because individuals will tend to cache all tools near faces.

Another material that can help identify how labor is organized at quarries is charred limestone. Although little ethnographic evidence is directly recorded in the Maya area, fire is known to have been used in other areas to chemically and mechanically weather limestone (Foster 1905; Binford and O'Connell 1984; Kopper and Rossello-Bordoy 1974). Many archaeologists in the Maya area have noted a preference for quarries to be located near naturally weathered outcroppings (Beekman 1992; Sweely 2005; Weiss-Krejci and Sabbas 2002; Graham 1994; Scarborough 1991). The general hypothesis is that the Maya preferred these sources for fill stones and nonfaced stones because exposed stone tends to break apart easily. This preference toward weathered rock is seen in ethnohistoric cases (Hayden 1987; Nelson 1987; Cook 1982). The charred limestone in the Chan excavations suggests that the Chan quarriers knew that when naturally weathered limestone was not available, fire could be used to artificially weather stone.

The recovery of charred limestone should be expected on a quarry where fire was used to weather stone. Generally, when fire cracking is practiced, people tend to reduce their load by leaving charred stone on or near the quarry (Binford and O'Connell 1984). However, it seems that this observation would only hold true as long as the quarrier's goal was to acquire stone for later use as a finish product. When quarrying is being done just to acquire fill stones, then burnt and unburnt limestone might all be removed from the quarry for use.

Discussion

If we consider the ethnographic literature alongside archaeological data from Chan and other Maya sites, we can see that quarrying was an activity organized in many ways for different economic ends. In some cases, Classic Maya quarries were accessed by informal labor, probably of individuals. These quarries were very likely "public domain" and supplied the household level of the economy. Other quarries were more restricted in their use. Evidence suggests that these quarries were more intensely used, and labor was probably organized at a higher level for the extraction of stone from these quarries. These quarries were probably used by household groups in order to participate in the village-level economy. Although large-scale extraction is not seen at Chan, larger Maya sites have evidence for larger-scale extraction projects, which may represent extraction of stone for regional markets. The presence of these different economic strategies associated with different quarries can be seen in both the data acquired from the quarries and the data acquired from associated house structures.

None of the excavated quarries at Chan represent large-scale extraction projects for the regional economy. However, two such quarries have been excavated in other Maya contexts. One of the more recently recorded large-scale quarries primarily produced large limestone blocks (Beekman 1992). This quarry was not located near any particular settlement but could be accessed along a nearby river bend. Larger sites were connected to this quarry by the river, and this quarry was being worked to satisfy the demand for faced stone blocks. The labor used to work the quarry could have been supplied by nearby larger sites (Beekman 1992). The other well-documented large-scale quarry was used to extract soft slake lime (Folan 1977, 1982). Based on the scale of this quarry, the lime was being gathered for distribution in a much larger exchange network, one beyond the level of the site (Folan 1977, 1982). These two massive quarries are very different from the scale of production recorded at Chan but provide us a baseline for examining the smaller scale of production found at the level of the village and household.

Smaller quarries are a more widely recorded phenomenon in the Maya area. These quarries were often located adjacent to the building projects to which they supplied lime (Folan 1977, 1982). This is a common practice in Maya civic centers, for both limestone and fill-stone quarrying (Beekman 1992; Sweely 2005; Weiss-Krejci and Sabbas 2002; Graham 1994; Scarborough 1991; Sharer and Sedat 1987). These smaller quarries generally supplied the household level of the economy (Sweely 2005; Weiss-Krejci and Sabbas 2002).

Quarries B, C, and D at Chan represent quarries where stone resources were informally acquired for household use. This assertion is supported by the artifacts associated with these quarries, the amount of charred limestone recovered, and the general locations of the quarries.

Few artifacts were recovered from any quarry faces at Chan. However, the recovered quarrying tools all came from these quarries (tables 11.1). What is noteworthy is that the tools recovered from these quarries were all thick bifaces or informal picks. This is consistent with ethnographic contexts in which quarries were informally accessed (Hayden 1987; Nelson 1987) and quarries in which multiple individuals accessed the same feature (Nelson 1987). This tentatively supports the idea that these quarries were "public" (for lack of a better word) and were not controlled by particular individuals or households. In Cook's (1982) observations, these kinds of quarries were generally used for construction and road fill and were used by members of a community on an as-needed basis.

The locations of quarries may also help categorize them as informal and household oriented. As other archaeologists have noted, small depressions characteristic of capstone quarries are a common feature at many Maya sites. These features are often adjacent to the houses that they presumably supplied with stone (Sweely 2005; Weiss-Krejci and Sabbas 2002; Folan 1977, 1982) and are clearly different in scale from the larger quarries that supplied stone for regional exchange (Beekman 1992; Folan 1982). Quarries B, C and D are all close to Structures C-010.1 and C-011.1 and a series of small terraces. Much of the Chan community was terraced, and this terracing was built in an accretional fashion, implying that the labor for their construction was organized by individual households and groups of households (Wyatt, ch. 4, this vol.). Thus, stone that was quarried for house and terrace construction represents consumption and production focused at the level of the household economy. Quarries B, C, and D appear to have been used to supply stone for nearby building projects. Therefore, the exploitation of these features was likely not intended as a method of participating in any sort of exchange; rather, labor was organized to acquire expedient building materials for household projects.

Unlike quarries B, C, and D, quarry A, the largest and most substantial quarry in the study area, seems to represent a different economic orientation. The quality of limestone on this quarry face is different from that of the other quarries: the stone is harder and less weathered and breaks off in hard tabular faces. Ethnographic accounts have noted that stone workers note quality differences in stone and intentionally mine quarries for these qualities based on the end product they wish to create (Cook 1973). This means that the differences between quarry A and the other three quarries might reflect differences in utilization based on different demands for different final products. If the quarries were being quarried differently, it is likely that the stone was being worked and exchanged differently too.

The utilization of quarry A seems to reflect a different method of organizing labor. Unlike the other three quarries, no thick bifaces were recovered from the excavations in quarry A, despite the more extensive nature of the quarry A excavations. This absence of tools on quarry A is consistent with ethnographic observations that formal tools tend to not be left on or around quarries that are privately owned (Cook 1973, 1982). This observation suggests that quarry A was not being exploited using the same labor practices as other quarries. The tools used for quarrying on quarry A were being stored elsewhere; in ethnographic literature, this is usually what happens when a quarry has a head who organizes the labor (Cook 1982). This among other lines of evidence (discussed below) suggests that one or more of the nearby households might have controlled access to this quarry.

The recovery of charred limestone from all quarries suggests that fire cracking was a technological process used in most circumstances. However, differing amounts of charred limestone suggest differences in the use of fire cracking at quarries. When volume of excavated soil is considered, quarries B, C, and D have substantially less charred limestone than does quarry A (table 11.2). Moreover, among these quarries, more charred limestone was recovered from quarries that are located on the sides of hills. These observations can be interpreted in one of two ways: either some quarries were more intensely used, or some quarries were being exploited for different resources. These interpretations are not mutually exclusive.

The first possibility is that the quarries were subjected to different intensities of use. Charred limestone has been recorded as refuse from quarries where fire cracking was clearly used (Binford and O'Connell 1984; Foster 1905). However, not all contexts necessarily yield this material (Kopper and Rossello-Bordoy 1974). Moreover, techniques for fire cracking can vary. In some contexts, quarriers might have created sustained fires to chemically weather stone; in other contexts, they may have subjected quarry faces to alternating rounds of fire and cold water as a means of using thermal alteration to mechanically weather stone (Kopper and Rossello-Bordoy 1974). If Chan's quarriers used the same quarrying techniques at all quarries, then we could suggest that the limestone of quarry A was preferentially used. However, if the quarries were being utilized using different techniques, then we might not be able to suggest that one stone face was more intensively used. Volume of charred limestone could represent intensity of use, or it could represent an alternative technological approach to quarrying the different kinds of stone. Either way, a distinction exists between quarry A and the other three quarries.

The other possible explanation for varying frequencies of charred limestone is that the desired finished stone products might have been different depending on the type of stone. As multiple authors have noted, the tendency to reduce stones at the site of the quarry is a common practice in Mesoamerica and the Maya region (for ethnography, see Cook 1973, 1982; Hayden 1987; Nelson 1987; Holmes 1919; Gallagher 1977; for archaeology, see Scarborough 1991). The general reason for this practice is to reduce the transportation load. If the desired end product of the quarry was simply fill, then whether limestone was charred or uncharred would not matter. However, if the desired material was faced limestone blocks, then the smaller charred rocks would be nothing more than reduced refuse.

Looking at Structures C-010.1 and C-011.1, we can see that the way limestone was distributed in the construction of these structures varied by type of stone. The heavy stone found in quarry A tends to break in hard tabular surfaces; as a result, most of the faced stones of these structures are made of this stone type. Generally, none of these stones have burning or fire scorching on them. However, the fill stones of these structures are made from a combination of refuse, soil matrix, and limestone. This limestone is a combination of soft early fractured capstone and the harder stone from quarry A, and this limestone fill also contains burnt limestone. These observations further the argument that quarry A and quarries B, C, and D were differentially used to meet two different construction needs. The soft limestone from quarries B, C, D was used as a general fill for structures and terraces, whereas the hard limestone from quarry A was a specialized material that was used to make hard angular surfaces and face structures.

The residents of Structures C-010.1 and C-011.1 used both hard tabular limestone and soft capstone in the construction of their homes, as did other residents at Chan. But residents' roles in the extraction of these raw materials seem to have varied between the two households. While a similar range of domestic activities was going on in Structures C-010.1 and C-011.1, the quantity and density of thick bifaces differed between the two households.

Structure C-010.1 was associated with more thick bifaces (table 11.1).

As discussed above, in contexts in which quarries were accessed by individuals under more-formal ownership, there is a tendency for tools to be stored in individual houses (Cook 1973, 1982). Not only were there more thick bifaces at Structure C-010.1, but the condition of these implements was fragmentary. Their fragmentary condition matches the condition of the thick biface associated with a quarry face but is different from the more complete condition of a thick biface left associated with an agricultural terrace (figure 11.1). This observation could suggest that the residents of Structure C-010.1 maintained the quarries or accessed them more regularly than did the residents of Structure C-011.1. They may have been responsible for organizing labor along quarry A. This quarry produced a specific type of limestone, angular limestone blocks, that would have been required for facing houses across the community. Through accessing this quarry, the residents of Structure C-010.1 would have been able to participate in the village level of the economy.

Structure C-011.1 presents a different case. When compared to Structure C-010.1 this structure and its associated terrace had a wider variety of artifact types but fewer thick bifaces (table 11.1). This seems to indicate that the residents of Structure C-011.1 were likely less involved in specialized quarrying activities. The size and condition of the thick bifaces from C-011.1 are comparable to those of a thick biface found on the adjacent agricultural terrace. The lower density and more complete condition of thick bifaces at C-011.1 could indicate that the replacement rate for these artifact types was lower at Structure C-011.1. Though the evidence is tentative, it is plausible that the residents of Structure C-011.1 were using their thick bifaces in agricultural production rather than in quarrying.

Conclusion

Traditionally we have looked at economic interactions as a process that existed primarily between elites or as a process that occurred between sites (Sheets 2000). However, as we can see, "commoners" are not just background noise in this process but engage in economic strategies for the provisioning of their own households and communities. The simple commodities produced for village consumption are not so simple. Rather, a seemingly mundane material like stone has multiple methods of extraction, which reflect differences in organization and ownership. These differences lead to distinctions between peoples within the village. Superficially, Structures C-010.1 and C-011.1 are very similar; however, when we look at their tool assemblages and compare this data to known patterns of resource use, we can see that these two households accessed the village economy in very different ways.

A social analysis of quarries shows that quarries are not just empty landscapes from which stone was extracted. Quarries were active locales where people labored and interacted, developing economic strategies for their households. Excavations of quarries and associated households revealed that people at Chan exploited quarries to access two levels of the economy—the household level of the economy and the village level of the economy.

At least two types of limestone, as a raw material, existed at the Chan community. The readily available type was a soft, easily broken limestone. This type of limestone was primarily used as fill and was generally broken from naturally weathered faces. Ethnographically, stone like this was often in the "public domain," and its exploitation was generally executed with informal tools at the site of its extraction. At Chan, this pattern seems to be reflected in the assemblages associated with quarry faces B, C, and D. Informal access to a resource like this soft stone generally provisions nearby households. The other type of stone quarried at Chan is a hard tabular limestone. This stone was generally used to make the facing stones of the low house structures found throughout the community. Outcroppings of this stone are infrequent, and the excavated example of such an outcropping, quarry A, shows its intensive use through a fire-cracking technique. The lack of stone artifacts found in association with this kind of quarry is consistent with ethnographic accounts of situations in which ownership of quarry resources is controlled by individuals or households. Artifacts from Structures C-010.1 and C-011.1 demonstrate that their residents had different strategies of extraction associated with the raw material stone.

Although the residents of Structures C-010.1 and C-011.1 appear to have been of equal status from an elite perspective, they were different in their ability to access local and exotic materials. The relative status of villagers is reflected not only in their ability to access regional markets or prestige goods but also in their ability to relate to one another in a village setting. Quarrying for stone facing material is time consuming and hard labor, and this task as a specialized economic strategy seems to have fallen into the hands of only a few of Chan's households. Other households at Chan seemed to have been able to engage in other specialized economic pursuits and did not need to maintain the tools or labor strategies necessary to extract hard faced stones. Whether or not these quarrying households were "dependent" on quarrying for their subsistence cannot be extrapolated from this data set. But this study does raise the question, can the village level of the economy be used to foster relationships of interdependency between a community's households? More importantly, do these households engage in specialized activities as a mechanism for enhancing a sense of group identity? Ethnographic and archaeological research has identified that "commoners" will attempt to forgo economic interactions with larger centers as a method of maintaining autonomy (Wolf 1955; Falconer 1995). The farmers and stone quarriers of Chan might have been engaging in economic exchange with one another not only as a method of provisioning households but also as a buffering strategy against the uncertainty of vagaries in broader regional economies. Moreover, this possible interdependence between households at the village level may well have been a way of codifying a cohesive identity between the members of the Chan community.

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Bodies, Material Culture, and Meaning

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12

The Chan Community

A Bioarchaeological Perspective

ANNA C. NOVOTNY

No archaeological data set speaks more to the lives and deaths of the Chan people than the skeletal remains of the Chan people themselves. The following bioarchaeological study seeks to elucidate two aspects of ancient lifeways of the Chan community: physical well-being, garnered from osteological data on health; and mortuary ritual. Chan's unusual temporal depth allows us to address questions about how health, well-being, and ritual practices changed over time. The Chan bioarchaeological data reveal a community with a vibrant and complex ritual life that persisted over two millennia.

The Chan skeletal sample represents individuals specially selected for burial in the community center ancestor shrine. Human burials and ritual caches were placed in the Chan community center beginning in the Middle Preclassic period to the Early Postclassic period (650 BC–1150/1200; Kosakowsky, ch. 3, this vol.; Kosakowsky et al., ch. 15, this vol.). The central ritual architecture of the Chan community center was an E-Group (Robin et al., ch. 6, this vol.). Throughout the Maya area, buildings marking the eastern side of a plaza, as part of a tripartite E-Group structure, residential group, or monumental public plaza, seem to have functioned as loci of corporate group rituals including rites of ancestor veneration (Becker 1971; McAnany 1995, 1998).

Burials were found in three locations in Chan's community center—within the E-Group, in the Central Plaza between the east and west structures of the E-Group, and in the West Plaza's L-shaped Structure 8. Nearly 75 percent of all human burials placed in Chan's community center were interred within the E-Group complex. The Chan sample consists of a total of 25 individuals from 19 separate mortuary contexts (table 12.1; Novotny 2007).

Table 12.1. Burials at Chan's community center

Burial	Time period	Age	Sex	Grave offerings
1	Middle Preclassic	Adult	?	Reworked jade (3)
1 (1st reentry)	Middle Preclassic	N/a	N/a	Jade piece (1), greenstone piece (2), serpentine piece (4), unidentified marine shell bead (1)
1 (2nd reentry)	Late Preclassic	N/a	N/a	Jade bead (2), broken jade celt (1), reworked jade piece (1), serpentine piece (2), unidentified marine shell bead (2), *Strombus* detritus (3), worked slate (3)
8	Late Preclassic	16–20	M	Sierra Red dish (2), Paila Unslipped dish (2), Hillbank red dish (1), Laguna Verde Incised bowl (1), 38 cm long honey-colored chert blade (1), jade pendant (1)
9	Late Preclassic	23–25	M	Sierra Red bucket (1), Society Hall Red bucket (1), incensario or stove prong (1)
10	Late Preclassic	20–24	M	Sierra Red bucket (1), curated Middle Preclassic figurine head (1), incensario or stove prong (1), jade bead (1), hematite (1), stingray spine (1), shell ornaments (3, including *Spondylus*, *Busycon*, and *Nephronaias*), obsidian piece (1), pieces of turtle carapace
14	Late Preclassic	Adult	?	Sierra Red dish (1), curated Middle Preclassic figurine torso (1), jade beads (3), jade pendant (3), *Nephronaias* ornaments (2), *Strombus* detritus (6)
15	Late Preclassic	Juvenile	?	*Strombus* spirals (2)
16.1	Late Preclassic	Adult	M	Worked jade chunk (1), broken jade celt (1), jade pendant (1), jade bead (1), *Olivella* shell beads (99), *Marginella* shell bead (1), *Strombus* adorno (1), obsidian piece (1); grave goods may have been associated with either or both Individuals 6.1 and 6.2
16.2	Late Preclassic	5–6	?	
17	Late Preclassic	Adult	?	Curated Middle Preclassic figurine head (1), *Strombus* detritus (3)

6	Terminal Preclassic	18–22	?	Cabro Red bowl (1), Paila Unslipped jar (1), jade bead (1), unworked quartz crystal (1)
2	Terminal Preclassic	20–29	M	*Strombus* adorno (2)
12	Early Classic	8–9	?	Serpentine piece (1), *Strombus* detritus (3)
20	Early Classic	Adult	?	None
4	Early Late Classic	Adult	?	Jade bead (2)
5.1	Early Late Classic	20–24	F	Obsidian (1) may have been associated with either or both Individuals 5.1 and 5.2
5.2	Early Late Classic	30–35	M	
7	Early Late Classic	18–22	F	*Olivella* shell bead (1), obsidian piece (1)
11	Early Late Classic	20–30	?	Obsidian piece (2)
19	Early Late Classic	20–24	M	Obsidian piece (4)
3.4[a]	Early Late Classic	Adult	M	Obsidian piece (1)
18	Early/Late Late Classic	40–55	F	Broken mano (1), broken biface (1)
3.3[a]	Early/Late Late Classic	Adult	M	*Strombus* adorno (4), *Strombus* bead (1), *Spondylus* fragment resembling a frog's foot (1), adorno of unidentified marine shell (1), sea bivalve (1), obsidian piece (1), feline teeth (2)
3.5[a]	Early/Late Late Classic	Adult	?	None
3.2[a]	Late Late Classic	Adult	F	*Marginella* and spire-looped dwarf olive shell beads (322)
3.1[a]	Late Late Classic	Adult	?	None

a. An additional shell bead and piece of obsidian were identified in the screen associated with Burial 3 and may have belonged to any of its individuals.

The earliest burial in the Chan sequence is a Middle Preclassic burial from its Central Plaza. Excavations were conducted in the central and northern east structure of the E-Group (Structure 5–center and Structure 5–north), and burials were identified in both structures from the Late Preclassic period until the late Late Classic period, when the last human burials were interred there (Novotny and Kosakowsky 2009). Looting disturbed the latest contexts in the west structure of the E-Group, and only early period burials from the Late and Terminal Preclassic periods were identified. The L-shaped Structure 8 located in the West Plaza contained four burials, the earliest of which dates to the Early Classic period and the three others dating to the Late Classic period.

Methods: Bioarchaeological Analysis of the Chan Sample

All skeletal data were collected in accordance with the Standards for Collection of Data from Human Skeletal Remains (Buikstra and Ubelaker 1994). This document is a compilation of techniques used in osteological analysis that outlines methods for determining age, sex, pathological conditions, and cultural body modifications. As much of these data were collected for each individual as possible. Age was estimated for most skeletons by dental wear and dental eruption, although where preservation was adequate, epiphyseal closure, cranial sutures, and pelvic morphology were also used. Sex was determined by a combination of cranial traits, pelvic morphology, and long bone measurements as preservation allowed.

For the multiple individual burials, a taphonomic approach to osteological analysis called *anthropologie de terrain* was employed (Duday et al. 1990). This method takes into account how the intrinsic factors of the body and extrinsic factors of the burial environment contribute to the disarticulation of the joints of the body. Reconstructing the process of disarticulation reveals aspects of mortuary ritual, such as tomb reentry or wrappings that may not be visible in the archaeological record. Maintenance of labile, or weak, articulations—the cervical vertebrae, small bones of the hands and feet, the temporal mandibular joint, costosternal, and scapulo-thoracic articulations (Duday 2004: 33)—indicates a primary burial. A secondary burial is missing small skeletal elements, and the labile articulations are not maintained (Duday 2004: 45–46). It is crucial, of course, to consider what other factors may have caused the bones to become disarticulated—bioturbation, scavenging, looting (modern or ancient), or disturbance by excavators. Here, I follow McAnany and Storey's more specific definition

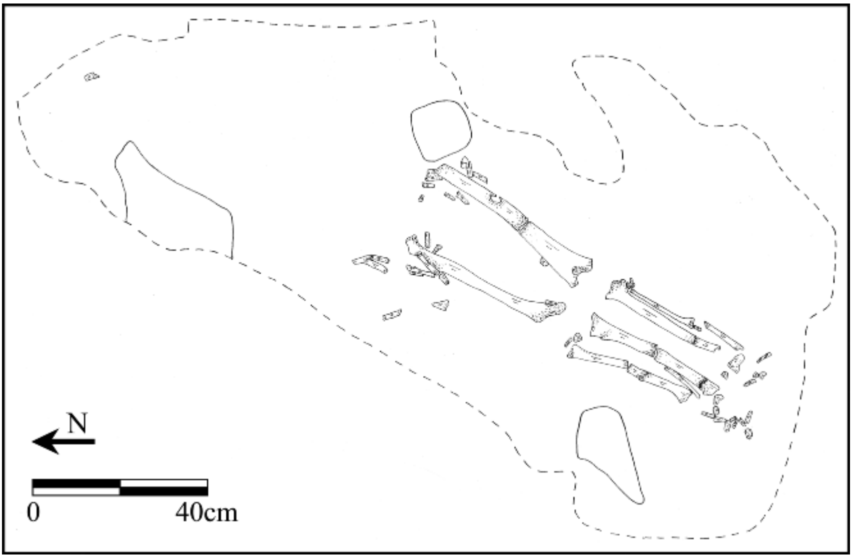

Figure 12.1. Burial 1. (Illustration by Carmen Ting.)

of a secondary burial as a primary interment that was exhumed and reinterred or remains defleshed and then bundled for interment (McAnany et al. 1999: 131). The contents of a secondary burial can vary widely to a nearly complete but disarticulated skeleton to only long bones and a mandible (McAnany et al. 1999).

Chan Community Burials

Middle Preclassic (650–350 BC; Boden Complex)

The Middle Preclassic marks the placement of the first burial in Chan's community center. Burial 1, a 20–24-year-old adult of unknown sex, was interred in a simple cist grave carved into bedrock in the Central Plaza (figure 12.1). The body was laid in a supine, extended position with the "head" toward the northeast (Blackmore 2003). The burial was determined to be a primary burial because of the presence of small bones of the hands and feet in the grave and maintained articulations of the knee and pelvis (Novotny 2007). Three pieces of reworked jade were the only objects found within the grave. One of these was complete, and the other two were fragments that were likely part of the same original piece (Keller 2008). Burial 1 was located immediately to the east of a series of caches placed in carved bedrock pits containing ceramic items, obsidian, jade, serpentine, and marine shell (Robin et al., ch. 6, this vol.; Kosakowsky et al., ch. 15, this vol.).

Several pieces of evidence suggest that Burial 1 was reentered in antiquity. First, in the excavations above the burial the stratigraphy was mixed (Blackmore 2003) and fragments of human bone, jade, serpentine, and shell artifacts were found. These artifacts and bone fragments appeared to have been intentionally placed. The bone fragments were all horizontal, oriented to the long axis of the burial, and carefully stacked. The nature of the stratigraphy and placement of the fragments and artifacts led Blackmore to identify at least two reentry episodes, which Kosakowsky (2007) has now dated to the Middle and Late Preclassic periods, respectively. Second, although several major joints were still articulated, the right humerus was found besides the right femur, and bones of the cranium, torso, and left arm were not present (Blackmore 2003). Finally, fragments of reworked jade were found in caches located adjacent to the burial and may have refit with the two reworked jade fragments from the burial (Keller 2008).

Very little evidence was found of trauma or illness. A healed fracture callous was present on the posterio-medial aspect of the right fibula. The callous was well healed, indicating that the trauma took place well before the individual died (Novotny 2007).

Late Preclassic (350 BC–AD 100/150; Cadle Complex)

In the Late Preclassic period, burials were identified in the central east and west structures of the E-Group.

East Structure of the E-Group: Structure 5–Center

Three interments were placed within Structure 5–center during the Late Preclassic period—Burials 8, 9, and 10. Because of the presence of small bones of the hands and feet and the maintenance of certain articulations, Burials 8, 9, and 10 were deemed primary burials. The skull of Burial 8 was situated in the grave in its anatomically correct position but was located within a ceramic vessel and may have been removed from the grave sometime in prehistory.

Beginning with Burial 10, the Late Preclassic burial practice consisted of the excavation of a grave through the contemporary plaster floor into building fill. The grave of Burial 8 was placed directly in subfloor fill, and this is the only grave not cut through a plaster floor in the Structure 5–center sequence. In several cases, grave excavation halted at the plaster floor of a previous structure, allowing the plaster surface to form the bottom of the grave. Grave construction differed between burials. Burial 10 was entombed in a simple pit (Welsh 1988). Simple crypts, consisting of stone slabs lining and capping the grave, were constructed for the individuals in Burials 8 and 9 (Welsh 1988). All three burials were laid in extended positions with heads to the south, as was customary for many burials in the Belize Valley (Welsh 1988). Burials 8 and 9 were in a prone position; however, the poor preservation of Burial 10 precluded identification of body position.

The relatively simple tomb construction of Burial 10 is belied by the quantity and quality of grave goods within it. The objects found within Burial 10 include a Sierra Red recurving bucket, a curated Middle Preclassic figurine head, an *incensario* or stove prong, a jade bead, a piece of polished hematite, a stingray spine, three shell items (including *Spondylus*, *Busycon,* and *Nephronaias* ornaments), an obsidian blade piece, and pieces of turtle carapace. Burial 8 contained six ceramic vessels—two Sierra Red dishes, two Paila Unslipped dishes, a Hillbank red dish, and a Laguna Verde Incised bowl. A 38 cm long chert blade of honey-colored northern Belize chert was also recovered, as well as a jade pendant placed between the teeth of the Burial 8 individual. Burial 9 was interred with a Sierra Red bucket and Society Hall Red bucket, which was placed over the head, and an incensario or stove prong.

All three Late Preclassic burials were young adult males between the ages of 18 and 24. The young male in Burial 10 showed early signs of osteoarthritis in several vertebral fragments and a possible sinus infection within an unsided fragment of maxilla (Novotny 2007). The upper, central incisors of Burials 8 and 10 were filed in type I1 (Romero Molina 1986), in which square notches are carved into the distal corners of the teeth. Burial 9 did not have dental modification. The cranial remains of Burial 8 showed an isolated locus of sclerotic bone, which may have been caused by trauma or a mild infection (Novotny 2007). Burial 9 showed a suite of unique pathologies. These are described below.

West Structure of the E-Group: Structure 7

Four burials were interred in the west structure of the E-Group during the Late Preclassic period—Burials 14–17. Burial 17, consisting of only the cranium of a young adult male, was the first human skeletal material to be interred. Burials 14–16 were in close proximity to each other within the central stair block of the structure (Kestle 2005). The grave of Burial 16 was excavated through structural fill to the surface of a previous stair block,

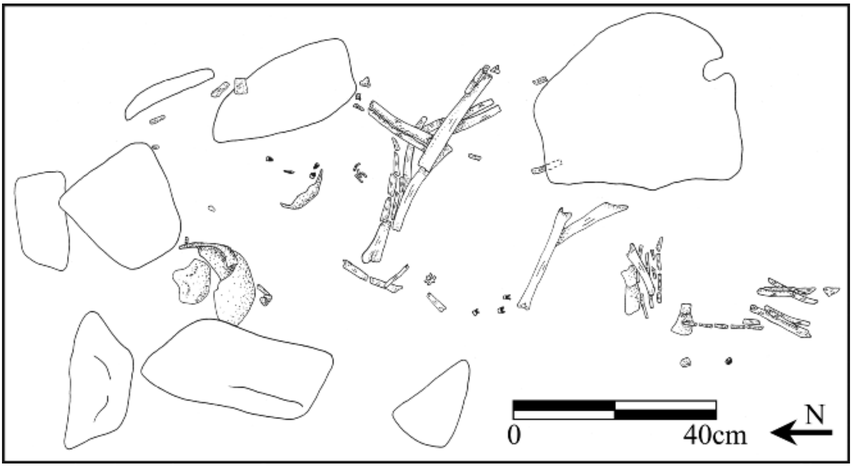

Figure 12.2. Burial 16, Individual 16.1. (Illustration by Carmen Ting.)

which formed the base of the grave (figure 12.2). Burial 14 was placed immediately on top of the capstones of Burial 16, and Burial 15 was located west of Burials 14 and 16. The grave construction of Burials 15–17 was the simple crypt form, while Burial 14 was placed in a simple pit (Welsh 1988).

Burial 14, most likely a primary burial because of the presence of small bones of hands and feet, was in a flexed position with head oriented to the north; a Sierra Red dish was also placed over the cranium. Because preservation of Burials 15 and 16 was poor, orientation and body position could be ascertained for Burial 14 only, but in both Burials 15 and 16 the crania of interred individuals were in the north end of the grave.

Jade and marine shell were the most common artifacts placed with the Late Preclassic period burials of the west structure of the E-Group. In addition to three jade beads and a jade pendant, Burial 14 included a curated Middle Preclassic figurine torso, a Sierra Red dish, two *Nephronaias* ornaments, and six pieces of worked *Strombus* shell detritus. Two *Strombus* spirals were placed with Burial 15. Burial 16 also contained a chunk of worked jade, a broken jade celt, a jade pendant, and a jade bead. A total of 99 *Olivella* shell beads, one *Marginella* shell bead, a *Strombus adorno,* and a fragment of obsidian were found in Burial 16. Burial 17 was accompanied by a curated Middle Preclassic figurine head and three pieces of worked *Strombus* detritus.

Burial 14 contained the remains of one adult individual of unknown sex. Poor preservation prevented accurate osteological analysis. Burial 15 consisted of the remains of a juvenile of unknown age. This burial was most likely a secondary burial, as indicated by the disarticulation and scarcity of skeletal elements. Burial 16 included two individuals: an adult male and a child aged 5–6 at death. As noted above, Burial 17 was a young adult male.

The preservation of all burials within the west structure of the E-Group was poor; thus, a fine-grained osteological analysis was not possible. Nevertheless, no pathological bone formation was observed on any skeletal or dental material.

Terminal Preclassic (AD 100/150–250; Potts Complex)

Two burials were identified dating to the Terminal Preclassic period: one was interred in Structure 5–center, the other in Structure 5–north.

East Structure of the E-Group: Structure 5–Center

One burial, Burial 6, was interred in Structure 5–center during Terminal Preclassic times. Similar to the burials in the Late Preclassic period, the grave of Burial 6 was cut through a plaster floor into substructural fill. The grave was a cist, less formal than the Late Preclassic–era stone-lined and capped crypts. One individual was interred within the cist, although preservation of the bone was very poor and orientation and position were indeterminate. The excavators suggested that the head might have been to the south, because of the presence of a jade bead in the southern part of the grave (Meierhoff et al. 2004). In addition to the jade bead, Burial 6 was interred with an unworked quartz crystal, a Cabro Red bowl, and a Paila Unslipped jar.

Poor preservation of the skeletal material rendered sex indeterminate. Several teeth recovered provided an approximate age of young adult, aged 18–22. The RC^1, RI^1, RI^2, and LC^1 all had severe linear enamel hypoplasias, indicating that the individual survived an episode of disease, malnutrition, or trauma when he or she was 3–4 years old.

East Structure of the E-Group: Structure 5–North

The only burial identified in the heavily looted northern east structure of the E-Group was Burial 2.

The grave of Burial 2 was intrusive into substructural fill. A simple crypt was built to hold the body (Meierhoff et al. 2004). The individual, a young adult male, was placed in an extended and prone position with head oriented to the south. Two adornos crafted from *Strombus* shell, possibly ear ornaments, were associated with the body of Burial 2. No pathological bone, teeth, or body modification was observed.

Early Classic (AD 250–600; Burrell Complex)

Two burials were identified from the Early Classic period. One was from the west structure of the E-Group, and the other was from Structure 8 in the West Plaza.

West Structure of the E-Group: Structure 7

Burial 12 was placed in the construction fill of the penultimate staircase of Structure 7. The grave contained a single individual laid in an extended, prone position with head oriented to the south. A piece of serpentine and three pieces of worked *Strombus* detritus were interred with this individual.

The grave contained the reasonably well preserved remains of a child aged 8–9 years. The body was placed in the grave in an extended, prone position with the head to the south. No pathological bone formation or trauma was observed on these remains.

West Plaza: Structure 8

The first burial to be placed in the West Plaza was Burial 20, within the fill of the original substructure of the L-shaped Structure 8. Burial 20, placed in a simple crypt with capstones, was interred in an extended and supine position with the head to the south. The supine placement of the body is an unusual position for the Belize Valley.

Burial 20 was a young adult of indeterminate sex. The only pathologies identified on the skeletal remains were carious on several of the teeth and a linear enamel hypoplasia on the LM^1. The lower legs and feet were missing and possibly had been removed in a reentry episode. Numerous capstones were found above the grave, many placed in a haphazard manner that may have been intended to mark the location of the grave for future visitation.

Early Late Classic/Late Late Classic (AD 600–800/830; Jalacte and Pesoro Complexes)

Seven burials were identified from the early and late Late Classic periods. Four were interred in the east structure of the E-Group (Structure 5–center), and three were interred in Structure 8 in the West Plaza. All four of the graves in the east structure of the E-Group were initially constructed in the early Late Classic period, but one, the cist grave of Burial 3, was used into the late Late Classic period. One of the Structure 8 graves dates to the early Late Classic period and two to the cusp of the late Late Classic period.

East Structure of the E-Group: Structure 5–Center

The first interment to be made in Structure 5–center during the early Late Classic period was Burial 3. Burial 3 was placed within fill of Structure 5–center's lower substructure. Burials 4, 5, and 7 were also placed in the fill of the lower substructure and were located adjacent to each other and Altar 3. Burial 4 was recovered north of Altar 3, and Burials 5 and 7 were interred south of Altar 3. All three graves were excavated through construction fill to the plaster floor of a previous construction, which formed the base of each grave (Meierhoff et al. 2004). Two grave types were used; Burials 3 and 4 were interred in cists, and Burials 5 and 7 were placed in simple crypts.

Burials 4 and 7 each contained one adult individual. Burial 7 contained the remains of a young adult female, aged 18–22. Unfortunately, Burial 4 was too poorly preserved for specific age or sex to be determined. Burial 7 had dental pathologies including caries and antemortem tooth loss of two left mandibular molars. Burial 4 was placed in the grave in an extended and prone position, head to the south. The exact position of Burial 7 is unknown, but its head was in the south end of the grave.

Two jade beads were interred with Burial 4. Burial 7 was interred with an *Olivella* shell bead and a piece of obsidian.

Burials 3 and 5 were multiple individual burials containing adults of both sexes. Burial 3 contained five individuals: one secondary burial consisting only of long bones (Individual 3.1), three individuals interred prone with heads oriented to the south (Individuals 3.2–3.4), and a fifth individual (Individual 3.5) represented by teeth only (figure 12.3). The three more-complete burials were most likely primary interments, based on the presence of numerous phalanges, metacarpals, and metatarsals. The arms, legs, and crania settled near each other, and it does not seem as though one individual was moved out of the way to make room for another corpse as was done in Burial 5 (see below). The space containing skeletal remains was remarkably shallow—the remains of all three individuals occurred within 20 cm of the floor of the grave (Meierhoff et al. 2004). Carbon-14 dating of human bone collagen marks Individual 3.4 as the earliest interment in Burial 3, placed in the grave in AD 640–710, and Individual 3.2 as one of the latest, dating to AD 680–890. The grave itself appears to have been revisited across the early and late Late Classic periods.

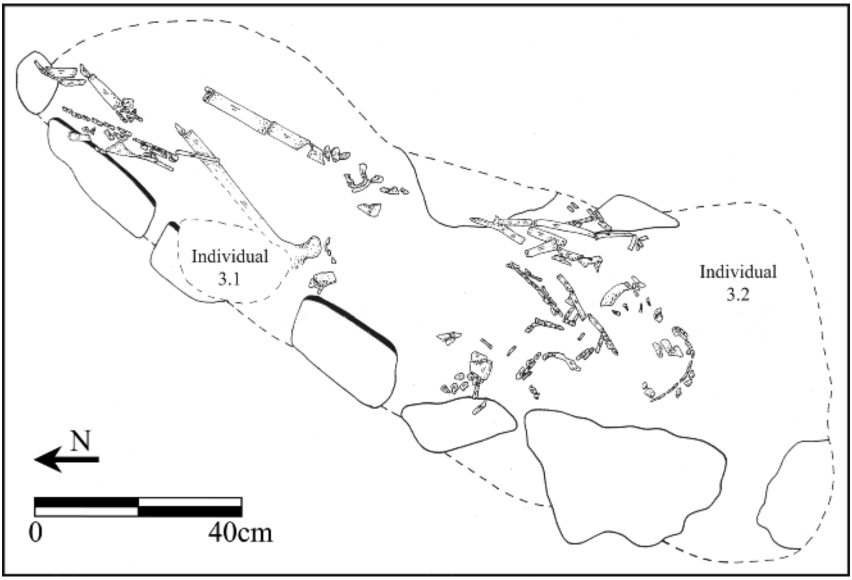

Figure 12.3. Burial 3, Individuals 3.1 and 3.2. (Illustration by Carmen Ting.)

Individual 3.4, an adult male, was the first to be interred in the shared cist grave. Several of his teeth were carious and showed moderate amounts of dental calculus. A piece of obsidian was associated with Individual 3.4.

The remains of Individual 3.3, also an adult male, were extremely poorly preserved. No pathologies were observed in the teeth or skeletal remains. Several unique shell objects, possibly decorations for an item of clothing or a shroud, were associated with the cranium of Individual 3.3. These included four *Strombus* adornos, one of which was fashioned into a rosette bead, a *Strombus* bead, a *Spondylus* fragment resembling a frog's foot, an adorno of unidentified marine shell, a sea bivalve, and a piece of obsidian. In addition, two feline teeth were recovered in association with Individual 3.3.

Individual 3.2 was a young adult female. Her LC^1 and RC^1 had been filed on both mesial and distal edges to form a point, Romero's type III7 (Romero 1986). A total of 322 tiny shell beads crafted from punch-perforated *Marginella* shells and spire-lopped dwarf olive shells were directly associated with the mandible of Individual 3.2, suggesting that she may have been interred with a necklace. An additional shell bead and piece of obsidian associated with Burial 3 were identified in the screen during excavation.

Burial 5 contained an older adult male and a young adult female (figure 12.4). The male, most likely interred first, was moved to the side of the

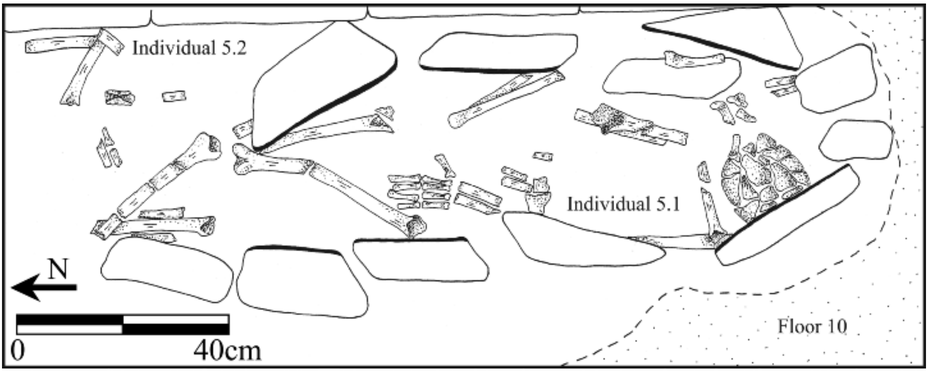

Figure 12.4. Burial 5, Individuals 5.1 and 5.2. (Illustration by Carmen Ting.)

crypt to make way for the female individual, whose body was in an extended, prone position with the head to the south. The female individual's right hand was completely articulated upon excavation, indicating that her body was most likely not the subject of extended funerary ritual after her interment in this crypt (Duday 2004). The body of the male individual was poorly preserved, and its burial position was indeterminate. It is difficult to say conclusively whether Individual 5.2 is a primary or secondary burial. The fact that there were teeth associated with the skeletal remains of Individual 5.2 suggests that the burial was primary. If the body was a secondary burial, it is less likely that it would include teeth, as they often become loose and fall out after decomposition and would be expected to be lost during transport of the remains (Roksandic 2002: 110). However, none of these teeth were recovered in alveolar bone, so it is impossible to say if they were actually from the individual represented by the long bones or if they represent a third individual.

A single piece of obsidian was recovered from the burial; however, it was unclear with which individual the obsidian was associated.

West Plaza: Structure 8

Early Late Classic Burial 11 from Structure 8 was significantly disturbed by looters, and several skeletal elements, including the skull, were missing. Burial 11 was a single individual, primary burial within a simple crypt (Welsh 1988). Two pieces of obsidian were interred with Burial 11. The individual in Burial 11 was estimated to be 20–30 years old at death and of indeterminate sex. No pathological bone or teeth were observed.

Two burials were interred in Structure 8 at the cusp of the late Late Classic transition. Burials 18 and 19 were placed within Structure 8 when the northwestern addition formed the building's final L-shape. They were located adjacent to each other, although Burial 19 was most likely interred slightly before Burial 18. The grave of Burial 19 was cut through the floor on which Burial 18 rested. Burial 19 was interred in a simple crypt, while Burial 18 was interred in a cist that made use of a freestanding wall as part of the wall of the grave (Welsh 1988).

Both contexts contained single individual, primary burials. Burials 18 and 19 conformed to the burial norm of the Chan site, and of the greater Belize Valley, and were in an extended, prone position, with the heads to the south. The left arm of Burial 19 was flexed at the elbow, the only burial from the Chan site in this position.

Burial 18 was interred with a broken granite mano and the medial fragment of a broken limestone biface. Four pieces of obsidian were placed with the individual in Burial 19.

Burial 18 was a female individual approximately 40–55 years old at death. Burial 19 was a male individual aged 20–24 at death. Burial 20 was an adult at the time of death, but because of the lack of preserved diagnostic remains, no specific age or sex could be determined.

Burial 19 had a well-healed fracture callous on left metatarsals 3–5 and had moderate amounts of dental calculus on several teeth. Burial 18 had a sclerotic bone reaction on the left and right fibulae, most likely due to a minor, local infection.

Discussion: Ritual and Well-Being in an Ancient Maya Farming Community

Mortuary Ritual at the Chan Site: Burial Location, Body Treatment, and Grave Goods

Details of mortuary ritual convey information about social organization (Binford 1971) and ancient belief systems (Carr 1995; Hodder 1982). The Chan community mortuary data attest to the rich and complex nature of social life among ancient Maya farmers, a subject only recently receiving its due attention (Lohse 2007; Robin 2002b). The Chan sample consists of burials from a particular context; only select individuals were chosen to be buried in Chan's E-Group, due to their membership in the leading family of Chan and their anticipated role as ancestors in the lives of their descendants.

At the Chan site, 79 percent (11 of 14) of individuals where burial position could be identified were buried in an extended and prone position with the head to the south. Only two individuals were interred in a supine position: Burial 1, a Middle Preclassic burial interred in the Central Plaza; and Burial 20, a Late Classic burial from Structure 8 in the West Plaza. Burial 14 in the west structure of the E-Group was interred in a flexed position with the head to the north. The pattern of burial in an extended, prone position with head to the south became common in the Late Preclassic period at many sites in the Belize Valley (Healy 2004: 21).

The small sample size precludes an in-depth analysis of mortuary treatment with regard to age or sex. As well, age and sex could not be determined for over half of the skeletal remains, further obscuring trends. However, general trends through time are apparent. Males were interred in the community center in all time periods, while females were interred there beginning in the early Late Classic period. From the Late Preclassic to the Early Classic, children were interred in the community center. They were placed exclusively in the west structure of the E-Group.

The mean age at death for individuals in all community center locations was young, mid-20s to early 30s, suggesting that age was a factor in the selection of ancestors to be interred in Chan's most revered spaces. Recent research by Stephen Houston (2009) describes the value placed on youth by the ancient Maya, at least among the noble portion of society. The concept of "tender, immature growth" (Houston 2009: 173) is particularly emphasized. Classic Maya hieroglyphs refer to young males as *ch'ok*, sprouts, an "allusion to the growth that leads eventually to fruition and productive harvest" (Houston 2009: 149). Youths that most likely belonged to the lineage of the king were referred to as *chak ch'ok*, great youths (Houston 2009: 165), and fulfilled various roles at court before entering fully into adulthood. Houston's focus is on the Classic period noble Maya, and he readily acknowledges that other segments of Maya society may have held alternative views on youthfulness. Nonetheless, he provides evidence that some of the youths, particularly those referred to on ceramic vessels as "great youths," were intended to eventually become ancestors after living long, productive lives (Houston 2009: 173). The Chan Maya constituted a different portion of Maya society, but their interment of young individuals, particularly males, in a location and with objects associated with ancestors is intriguing.

Women were also interred in Chan's E-Group, although their placement therein occurred less frequently. Females are sometimes underrepresented in skeletal populations (Larsen 1997). The robusticity of cranial features in older females resembles that of males because of postmenopausal hormonal changes and may lead to errors in determination of sex (P. Walker 1995). Other researchers suggest that the generally more gracile nature of the female skeleton results in poor preservation, lending further bias to skeletal samples when remains are unidentifiable with regard to sex. Walker and colleagues (1988) tested the latter point on a cemetery sample for which sex and age were known from historic records and did not find a significant difference in preservation between the sexes. Sample representation and paleodemographic reconstruction, and interpretations of social life which are based on these reconstructions, remain a challenge to bioarchaeological research (Geller 2008; Larsen 1997).

Reentry into graves as part of extended mortuary rituals is well documented in the Maya area (Buikstra et al. 2004; Eberl 2005; Fitzsimmons 2009; Palka 1995). Extended mortuary rituals served to maintain the link between the living and their deceased ancestors so that the ancestors were well cared for and willing to, in turn, provide sustenance and good health to their descendants (Astor-Aguilera 2009). Burial reentry is evident at Chan beginning in the Middle Preclassic period. Burial 1, interred in the Central Plaza, was reentered during the Middle Preclassic and Late Preclassic periods. Eight additional offerings were left above the grave in the Middle Preclassic period, and twelve additional offerings were deposited in the Late Preclassic period. These items either were items originally associated with Burial 1 that were removed from the grave during the reentries and then deposited above the grave, or they were items deposited above the grave during the reentry event to mark the location of the grave (Kosakowsky et al., ch. 15, this vol.; Robin et al., ch. 6, this vol.).

Burial 16 also has evidence of reentry. The grave, stratigraphically, dates to the Late Preclassic period and contains the remains of an adult and a child aged 5–6 at death. Carbon-14 dating of bone collagen from the adult dates the skeletal remains within the grave to the Middle Preclassic era. The adult remains are disarticulated and thus were most likely removed from their original location and redeposited in the west structure of the E-Group. The grave itself is small and may have been constructed to hold the remains of the child, which in turn were disturbed by the deposition of the adult secondary burial.

Burial 20, interred in the Early Classic period in Structure 8 of the West Plaza, may have evidence of reentry. The placement of the capstones and the absence of the lower limbs suggest that the grave was reopened in antiquity and the elements were removed (Latsch 2005).

Burial 3, an early Late Classic burial in the east structure of the E-Group, contained the remains of five individuals. Carbon-14 dating of bone collagen taken from two of the individuals dates one to the early Late Classic period and one to the late Late Classic period. These dates indicate that the grave was first used as a grave in the early Late Classic period and subsequently reused into the late Late Classic period.

Burial 5 contained the remains of two individuals and dated to the Late Classic period. At least one episode of reentry is apparent. The disarticulated remains of a male individual appear to have been moved to the side of the crypt to make way for a subsequent burial, a younger adult female.

There were three burials that contained multiple individuals—Burials 16, 3, and 5. Each was slightly different in its makeup. Burial 16 included the remains of a child and an adult, a practice common in the Maya area (McAnany et al. 1999; Welsh 1988). Burial 3 contained the remains of three primary burials and one secondary burial, all stacked upon one another, as well as a fifth individual whose initial burial treatment could not be determined. Burial 5 contained the remains of two individuals, one of which was certainly primary. As discussed above, it seems most likely that Individual 5.2 was a primary burial. If this is the case, then the treatment of the bodies in this burial is quite different from that observed in Burial 3: in the case of Burial 3, the bodies were stacked; in Burial 5, one was moved to the side most likely to make space for the second interment.

The placement of material objects within an individual's grave upon, during, or after his or her interment holds cosmological and ideological significance that may include information about the individual's position in the social hierarchy, the personal identity held by the deceased during life, or the significance of the individual's death to the living (Binford 1971; Carr 1995; Hodder 1982). The ancient Maya of Chan chose to memorialize and celebrate the deceased by placing a particular suite of items in graves. The type and quantity of objects placed within the grave varied according to the burial's context and the time period in which it was interred.

The Chan residents clearly demonstrated their preference for certain locations through the placement of graves therein and the quantity of objects interred in those graves. Burials in both the east and west structures of the E-Group were comparably furnished with grave goods. Burials in the east structure of the E-Group contained an average of 5.1 grave goods, and burials in the west structure of the E-Group contained an average of 5 grave goods.[1] Including artifacts placed during reentry events, Burial 1, the young individual interred in the bedrock grave in the Central Plaza, was associated with 23 grave goods. The burials of the West Plaza were the least well provisioned, containing only an average of 2 grave goods.

The type of goods placed in graves differed by location and changed through time at Chan. Within the E-Group, jade was a more common grave good in the west structure of the E-Group, and ceramic vessels and objects and obsidian blades were more common in the east structure of the E-Group. Jade was a more common grave good in the Preclassic period, and obsidian was a more common grave good in the Classic period. Shell detritus was only interred in Preclassic graves in the west structure of the E-Group. Ceramic vessels and other ceramic items were only interred in Preclassic graves. Starting in the Early Classic, ceramic vessels were no longer placed in any burials but were found in caches and terminal deposits (Kosakowsky et al., ch. 15, this vol.; Robin et al., ch. 6, this vol.).

The highest quantity of greenstone, however, was found in Burial 1 in the Central Plaza, including the reentry lots; many of these were broken pieces, which in some cases refit with one another or other greenstone fragments found in Middle Preclassic caches also in the Central Plaza (Kosakowsky et al., ch. 15, this vol.; Robin et al., ch. 6, this vol.). The only utilitarian items in the grave good assemblage were interred in the West Plaza burials. In terms of locational importance as indicated by the objects interred in graves, the E-Group and Central Plaza were the most significant burial places at Chan's community center.

Demographics and Health at Chan

Of the 25 individuals in the Chan sample, sex could be determined for only 13 individuals: 4 females and 9 males. Age could be determined with precision for only 13 individuals, as well (see table 12.1). Only three children were interred in the community center, aged 8–9 and 5–6 years and a juvenile of unknown age.

The individuals of Chan had an expected amount of pathologies of the teeth and bony skeleton. The most dramatic was the trauma sustained by the individual in Burial 9, a male aged 23–25 at death. All bones were extremely brittle and lightweight. The 12th thoracic vertebra showed a severe compression fracture on its right side. Three ribs, 10, 11, and 12, from the right side showed partially healed greenstick fractures of the anterior aspect of the bone just lateral to the neck of each rib. An infection, most likely originating in the fractured ribs, spread within the chest cavity. The severe decrease in bone density observed in Burial 9 is unexpected in a male individual so young in age. Disturbances to the endocrine system, particularly syndromes associated with an increase in secretion of cortisol (Cushing syndrome) or parathyroid hormone (hyperparathyroidism), can cause the dramatic loss of bone density observed in Burial 9 (Ortner 2003). An excess of cortisol results in suppression of new bone formation, and over time this causes bone to become brittle and thin (Ortner 2003). Parathyroid hormone regulates calcium levels in the blood, and high levels of the hormone increase bone resorption, which, over time, weakens the skeleton. The causes of hyperparathyroidism include tumors on the parathyroid gland. Cushing syndrome is sometimes a side effect of modern steroid medications or can be caused by a tumor on the adrenal or pituitary glands (Tortora and Grabowski 2003). In addition to weakening the skeletal system, high levels of cortisol suppress the body's immune response. Healing was evident on the rib and vertebral fractures, indicating that the individual in Burial 9 survived the traumatic episode for some time. It is possible that the immune response was not strong enough to stop the spread of infection throughout the chest cavity.

Although his case was the most extreme, Burial 9 was not the only individual who experienced episodes of trauma during life. Two individuals showed signs of healed fractures in their lower limbs, the right fibula of Burial 1 and the 3rd, 4th, and 5th metatarsals of Burial 19. These fractures were most likely caused by minor accidents, and both were well healed at death.

Only 22 percent of the individuals in the total sample showed some form of nonspecific stress indicator in the form of periostitis or linear enamel hypoplasias. Periostitis and hypoplasias are nonspecific indicators because they can be caused by an array of factors that leave identical marks on the skeleton and dentition (Hillson 1996; Ortner 2003). Periostitis is a proliferative bony reaction that appears secondary to trauma or infection (Ortner 2003). Periostitis is most commonly seen on long bones, especially the tibia, as these bones are close to the skin surface and are commonly the site of minor trauma. Four individuals, Burials 5a, 3a, 9, and 18, constituting only 15 percent of the sample, had periostitis on the tibia or fibula. With the exception of Burial 9, these insults were all healed or healing at the time of death, indicating that the affected individuals were healthy enough to survive minor episodes of disease or infection.

Only two individuals, Burial 6, from the east structure of the E-Group, and Burial 20, from Structure 8 in the West Plaza, had linear enamel hypoplasias. Hypoplasias are growth interruption lines that form after a severe disease episode, nutritional deficiencies, or trauma during dental development (Hillson 1996). Ethnohistoric data relay that weaning occurred between the ages of 3 and 4 among the Maya of the Yucatan peninsula, a statement supported by bioarchaeological studies of enamel hypoplasias and weaning (Tozzer 1941; Williams et al. 2005; Wright 1997; Wright and Schwarcz 1998). The hypoplasias on both Burial 6 and Burial 20 occurred between approximately 3 and 4 years of age, suggesting illness or nutritional stress associated with weaning as possible causes.

A lack of activity-related pathologies such as osteoarthritis (OA) is expected in the burials from the E-Group, as these individuals filled the role of community leaders who lead a less active lifestyle. Burial 10, one of the earliest burials in the east structure of the E-Group, was the only individual who displayed signs of OA, in the form of osteophytes, on a single vertebral fragment. The occurrence of OA has not been successfully linked to specific activities or behaviors in clinical studies (Jumain 1999; Pearson and Buikstra 2006). Clinical literature indicates that risk factors for OA include injury to joints while age of onset of mechanical loading and genetics also contribute to its occurrence (Jumain 1999). The Burial 10 individual was relatively young when he died (approximately 20–24 years old); thus, the presence of osteophytes on his spine, as minor as they were, indicates that though he was of higher status he led an active life, possibly starting at a young age.

Dental pathologies were common at Chan, as they are in many ancient Maya skeletal samples. Teeth were preserved in virtually every burial context, and 86 percent of individuals showed some form of dental pathology. The most common was dental calculus, or mineralized plaque deposits (Hillson 1996), with 45 percent of the sample affected. Fortunately for the Chan individuals, only minor calculus deposits were observed.

Dental caries affected 40 percent of the individuals in the Chan sample. Dental caries, or cavities, are the result of a destructive process in the enamel, dentine, and cement of teeth stemming from acid production by bacteria in dental plaque (Hillson 1996). Individuals in both the east and west E-Group structures had similar rates of caries, while there were no caries observed in the individuals from Structure 8 in the West Plaza. There was no difference between the sexes for caries or calculus rates, because of the small number of females in the sample.

Bioarchaeologists studying remains from other sites in the Belize Valley have observed a decline in health between the Preclassic and Classic periods (Healy 2004), a trend observed at the civic-ceremonial center of Tikal as well (Haviland 1967). Nonspecific indicators of stress, dental pathologies, and trauma were consistently present in the Chan sample from the Middle Preclassic to the Late Classic. The indicators of stress were not particularly profuse or severe, with the exception of Burial 9. Indicators of biological stress cannot be taken to indicate poor health in all cases. Skeletal lesions are evidence that the body mounted an immune response to the disease or episode of malnutrition, while lack of skeletal lesions may indicate a poor immune response and a quick demise (Wood et al. 1992). Although the sample is small and representative of only a segment of the Chan community, the consistent presence of a low degree of biological stress may indicate the persistent good health of the Chan community.

Three individuals showed dental modification in the form of tooth filing—two males with Romero's type A1 and one female with type C7 (Romero 1986). These individuals were all interred within the east structure of the E-Group. The two males were Burials 8 and 10, the earliest interments in the structure, while the female was a member of Burial 3, a Late Classic interment of five individuals. Cranial modification was not observed on any of the Chan individuals.

Conclusion

Traditional perspectives on farmers and farming communities often place them physically and intellectually on the periphery of society, in stark contrast to the association of civilization and "high culture" with urban areas (Redfield 1941). In fact, cross-cultural anthropological research indicates that farmers, far from being homogenous, conservative, and passive consumers of elite ideology, were dynamic consumers and producers of complex societies (Lohse 2007; Robin 2002b). Bioarchaeological data bring converging lines of evidence to bear on understanding the daily experience and long-term change in the lives of Chan residents. The Chan bioarchaeological study sought to elucidate two aspects of ancient lifeways of the Chan community: physical well-being and mortuary ritual. Community center burials do not represent the community as a whole; however, it is possible to conclude that the community, while not without health troubles, seemed to have been well off. Future research using stable isotope analysis will speak to the types of foods available to the Chan community. Careful attention to osteological data and stratigraphy indicate that burial reentry was practiced throughout Chan's history. Extended mortuary rituals to facilitate communication with the deceased ancestors and thereby enhance one's power is a theme drawn on by the ancient Maya elite in their epigraphic record (Eberl 2005; Fitzsimmons 2009). While it is well understood that elite rituals were garnered from commoner traditions (McAnany 1995), the fact that commoners, including the Chan community, maintained this tradition over two millennia has interesting implications for power relations in ancient Maya society. Clearly, a nuanced picture of an often overlooked part of ancient Maya society brings us closer to understanding not only the everyday life of Maya commoners but also how they related to society as a whole.

Note

1. Each individual object in a burial is counted as one grave good, with the exception of shell beads, which formed a single piece of jewelry, and *Strombus* detritus, both of which are counted as a single grave good.

13

Creating Community with Shell

ANGELA H. KELLER

Much of the recent archaeological interest in identity, and specifically the use of shell ornaments in the construction of identity, has focused on the identities of individuals as shaped by gender, age, and status (Isaza Aizpurúa 1997, 2004; Isaza Aizpurúa and McAnany 1999; Joyce 2000, 2001; Trachman 2006). The data for these arguments come largely from textual records, imagery, and burial contexts with secure associations between specific individuals and their accompanying grave goods. At the outset of the Chan project shell analysis, we anticipated addressing issues of individual identity, as have other scholars, but the shell materials and their contextual associations suggested a different tack. Few of the shell artifacts in the Chan shell collection come from contexts suggesting their use as individual identity markers. To the contrary, most of the shell items in burials, caches, and other contexts at Chan appear to have been involved in the negotiation of a shared community identity, rather than the manipulation of individual identities. Here, I examine three processes by which the people of Chan may have negotiated the social contours of their community with shell objects: (1) the consumption and ritual deposition of freshwater snails (*jutes*), (2) the ritual placement of shell items in caches and burials, and (3) the production and distribution of shell ornaments.

Analyzing the Chan Shell Collection

During the 2007 season of the Chan Project, Sylvia Batty, Elise Docster, Joyce Tun, and I catalogued roughly 29,000 shell items, including 558 ornaments, 106 pieces of broken marine shell, various freshwater and terrestrial shells, and more than 27,000 river snails of the genus *Pachychilus*, also known as jutes in Belize. The analyzed collection includes all of the worked and unworked shell from five years of excavation at Chan's Central Group and surrounding community with one caveat: only a sample of the jutes collected from a test unit placed in an extraordinarily dense deposit of jutes was analyzed (see below).

The Chan shell analysis followed the rigorous measurement and recording standards common in California shell ornament analysis (Bennyhoff and Hughes 1987; Gibson 1992; King 1990). We recorded provenience information, taxonomic identifications, shell portion, artifact form and type, detailed metric data, taphonomic observations, and the location and description of any cultural modifications (for example, perforations, incising, grinding). All worked shell artifacts were drawn by Carmen Ting and photographed in Belize by the author.

The analyzed Chan shell collection contains three freshwater and eight marine genera, as well as a handful of terrestrial taxa (table 13.1). Shell items were identified to the finest taxonomic level possible using low-power magnification (10× to 20×) and with reference to standard shell guides (Abbott and Morris 1995; Rehder 1996; Vokes and Vokes 1983), relevant archaeological reports (for example, Andrews 1969; Covich 1983; Emery 2004; Healy et al. 1990; Moholy-Nagy 1978; Stanchly 2003) and a type collection of modern and archaeological shell specimens. The taxonomic diversity at Chan is similar to that of other Belize Valley sites such as Barton Ramie (Willey et al. 1965) and Pacbitun (Hohmann 2002), although notably less than the diversity seen in collections from larger sites such as Tikal (Moholy-Nagy 1963, 1985) and Caracol (Cobos 1994). In addition, Chan and other Belize Valley sites tend to yield significantly more river snails (*Pachychilus* spp.) and Caribbean conchs (*Strombus* spp.) and less spiny oyster (*Spondylus princeps*) than is typical at larger sites. This differential distribution of shell taxa likely reflects the humbler political position of most Belize Valley sites relative to their larger neighbors. The scarcity of *Spondylus* in the valley also suggests that the trade in these lovely reddish orange shells was controlled in some manner and that the *Spondylus* trade network may have been distinct from that for other marine shell materials, such as conch and olive shell, that are more common.

Following the work of previous researchers in the Maya lowlands (for example, Isaza Aizpurúa and McAnany 1999; McKillop and Winemiller 2004; Moholy-Nagy 1963, 1987; Taschek 1994; Willey 1972, 1978; Willey et al. 1965), we divided the worked shell artifacts into several subtypes grouped into three generic types: beads, pendants, and *adornos* (table 13.2). Beads are shaped ornaments with roughly central perforations, whereas pendants display one or more off-center perforations, and adornos are unperforated.

Table 13.1. Invertebrate taxa identified in the Chan shell collection

Habitat/Taxon	Count (fragments)
Freshwater	
Nephronaias ortmanni (river mussel, thin-walled variety)	191
Nephronaias sp. (river mussel, pearly mussel)	46
Pachychilus glaphyrus (sculptured or ridged river snail [jute])	1,510
Pachychilus indiorum (smooth small jute)	23,150
Pachychilus sp., cf. *P. largillierti* (lightly sculptured jute)	1,735
Pachychilus sp. (jute, species unidentifiable)	1,308
Pomacea flagellata, cf. *P. flagellata arata* (apple snails, ref. Moholy-Nagy 1978)	47
Unidentifiable freshwater shell	5
Subtotal[a]	27,992
Marine	
Busycon sp. (whelk)	1
Dentalium eboreum (ivory tusk shell)	1
Lucina sp. (lucine)	1
Marginella apicina (common Atlantic margin shell; AKA *Prunum apicinum*)	350
Oliva reticularis (netted olive)	3
Oliva sayana (lettered olive)	5
Olivella floralia (common rice olive)	2
Olivella mutica (variable dwarf olive)	99
Spondylus princeps (Pacific thorny oyster)	23
Strombus gigas (queen or pink conch)	20
Strombus pugilis (West Indian fighting conch)	38
Strombus sp. (conch, species unidentifiable)	99
Unidentifiable marine shell	9
Subtotal	651
Terrestrial	
Various: Annulariidae, *Bulimulus*, *Euglandina*, *Neocyclotus*, *Orthalicus*, *Urocoptis*	237
Total	28,880

a. Only a sample of the jutes recovered during the excavation of the jute midden (Suboperation 3.B) were analyzed.

In coastal areas, analysts have also identified utilitarian artifacts including scoops, containers, and scraper-like, celt-like, and pointed tools (Cobos 2003; Inurreta 2006; Mock 2000). No utilitarian shell artifacts were identified in the Chan collection. For the Chan analysis, I also created two new types for broken bits of marine conch shell: perforated shells (figure 13.1) and shell-working detritus. These two types are generally interpreted as the remains of shell craft production in the Chan community. To begin this discussion, though, we will consider the large collection of jutes from excavations around the Chan community.

Table 13.2. Artifact types identified in the Chan worked shell collection

Type/subtype	Frequency	
	N	%
ADORNOS (NO PERFORATION)		
Countersunk disk	7	
Disk	3	
Saucer	2	
Rosette	2	
Geometric	1	
Anthropomorphic	3	
Zoomorphic	3	
Subtotal	21	3
BEADS (CENTRAL PERFORATION)		
Small disk (maximum diameter <10 mm)	19	
Large disk (minimum diameter > 10 mm)	12	
Squared disk	2	
Subrectangular	3	
Tube	7	
Rosette	4	
Toggle	2	
Tiny whole shell	451	
Dentalium	1	
Subtotal	501	76
PENDANTS (OFF-CENTER PERFORATION)		
Whole shell or valve	7	
Tinkler	8	
Plaque	4	
Subrectangular	2	
Geometric	1	
Subtotal	22	3
PERFORATED SHELLS (ROUGHLY CHIPPED WITH PERFORATION)		
Subtotal[a]	14	2
SHELL-WORKING DETRITUS (*STROMBUS* SPP. CUT AND CHIPPED PIECES)		
Columella	55	
Spire	7	
Body	44	
Subtotal	106	16
Total	664	100

a. No subtypes.

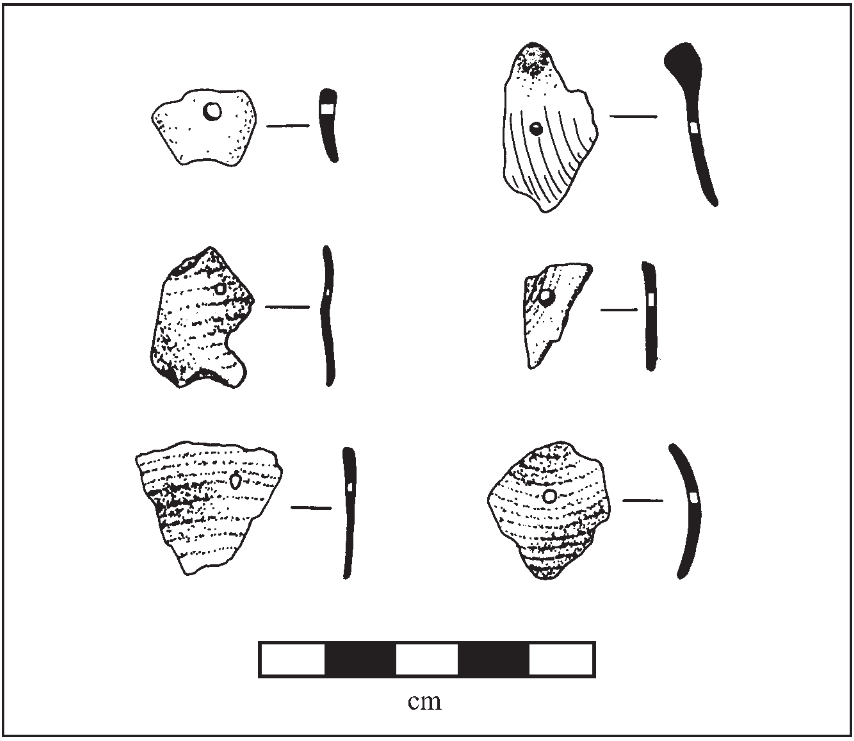

Figure 13.1. Examples of perforated shell artifacts. (Illustrations by Carmen Ting.)

The Proper Care and Handling of Jutes

The common river snail, or jute, has a long history of being neglected in archaeological analyses, but the many documented instances of freshwater snails in caches and burials (M. Brown 2001; Emery 2005; Moholy-Nagy 1978, 1985) and in cave deposits (Halperin et al. 2003) suggest that we should pay closer attention to these hardy little shells. To that end, we spent a considerable amount of time identifying, counting, and measuring the jutes from the Chan excavations.

The centerpiece of this analysis was a large collection of jutes from a single 2 m by 2 m excavation (Suboperation 3.B) placed in a dense midden consisting almost entirely of jute shells. This deposit, nicknamed the jute midden during excavation, is located along the west edge of leading family residence C-003 adjacent to Chan's Central Group (see figure 7.1). We could not analyze all of the more than 100,000 jutes collected from the jute midden, so we analyzed a greater than 10 percent sample (*n*=17,835) drawn

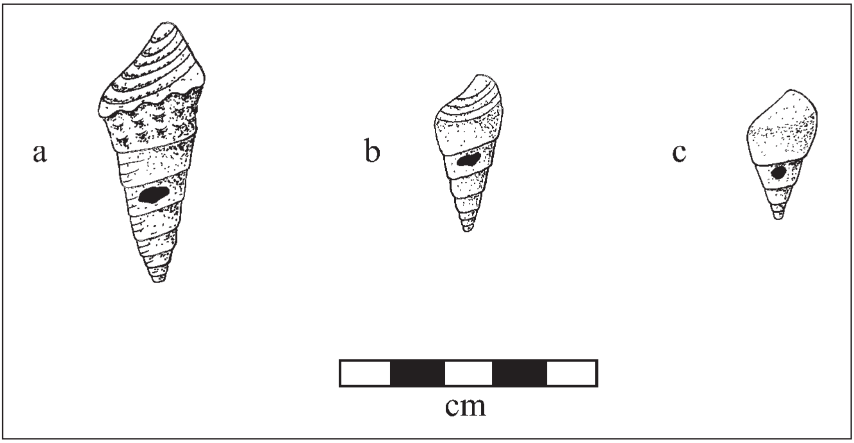

Figure 13.2. *Pachychilus* species diversity: (a) *P. glaphyrus*, (b) cf. *P. largillierti*, and (c) *P. indiorum*. All show characteristic extraction hole. (Illustrations by Carmen Ting.)

proportionally from all excavated lots. On the basis of the ceramics associated with the jute midden, as analyzed by Laura Kosakowsky (2007), the jute deposit was reworked or redeposited in this location in the Late Classic period, but the jutes themselves were likely consumed much earlier, in the Middle to Late Preclassic periods.

The jute midden collection is dominated by the smooth, small species of jute, *Pachychilus indorium* (96%), with a relatively tiny proportion of the larger sculptured species, *P. glaphyrus* (2%). We also distinguished a third, morphologically distinct variety of jute that I have tentatively identified as *P. largillierti* (2%) based on illustrations in the Barton Ramie report (Willey et al. 1965: fig. 309s,t) and illustrations in Eduard von Martens's treatise on the land and freshwater mollusks of Central America (von Martens 1890–1901: plate 26). We subsequently identified specimens of this possible "third species" in other contexts beyond the jute midden and from all time periods. The proposed *P. largillierti* type displays subtle ridging or sculpturing near the aperture that is distinct from and significantly less pronounced than that of comparably sized *P. glaphyrus* specimens (figure 13.2). The proportions of the possible *P. largillierti* shells are intermediate between the short and rounded *P. indiorum* and the long and sharply angled *P. glaphyrus*.

In addition to a new species, we identified a previously undocumented method of jute processing. Researchers have long known that a traditional method of processing jutes for consumption is to cut or lop off the shell's pointed spire, thus releasing the animal from its shell. During the jute midden analysis, we noted that many of the jutes did not have broken spires.

Fortunately, Sylvia Batty, our Belizean student intern, remembered how her grandmother used to make jute stew. She told us that her grandmother did not cut the spires when she cooked jutes but, instead, broke tiny holes in the sides of the shells to release the animals. Most of the smaller jutes in the jute midden collection display small punched holes in the sides of the shells (see figure 13.2). After looking at several thousand jutes, we can confirm that the holes are regular in placement and form and that they likely functioned in the same manner as spire lopping to release the animal's hold on its shell. In the jute midden sample, a majority of the jutes either have these extraction holes or are spire lopped, suggesting that they are food remains.

The jute midden is not only a large deposit but also an extraordinarily dense deposit of shells. The average density of the jute midden is 46,000 jutes per cubic meter. During the Operation 3 post-hole testing program in Chan's community center (chapter 7), we identified two adjacent portions of the jute midden (see figure 7.1). The main deposit is roughly 100 m^2 in area, and the adjacent, lower-density deposit is approximately 125 m^2 in area. Using these size and relative density estimates, and extrapolating from our analyzed sample, we calculated that the entire jute midden may contain roughly 2.7 million jutes.

The enormous quantity of shells indicates consumption on a grand scale far beyond the needs or consumption capacity of the largest extended family. Using Healy and colleagues' (1990) published nutritional data for *Pachychilus indiorum*, we can estimate that the jute midden contains approximately 23,000 meals of 500 calories each. If an average of 200 people came to the proposed Chan community gatherings, and each person had one jute "meal" per gathering, the jute midden could contain the debris from at least 115 gatherings. The jute midden appears to be the visible remains of repeated communal gatherings replete with festal foods through which Chan's emerging leaders in the Preclassic period may have asserted their distinctive authority and negotiated the terms of community life (Robin et al., ch. 7, this vol.; also see LeCount 1996).

In the Late Classic period, the leading families of the Chan community gathered these jutes to create an enormous sea of shell around their elevated platform residences. At the nearby site of Xunantunich, Tom Jamison (1992: 25) found a similarly dense deposit of jute shells placed in a pit dug into bedrock at the northwest corner of the central Structure A-1. He interpreted the shells as a ritual offering and possibly as the remains of feasting. Beyond the Xunantunich jute pit, the most comparable large and dense deposits of jutes are found in caves, where the intentional deposition of jutes seems distinctly ritual and arguably related to the concepts of sacred water, fertility, death, and renewal (Halperin et al. 2003). At Chan, the specific symbolic meaning of the jute midden remains uncertain, but the symbolic quality of the vast deposit seems undeniable.

Shell in Special Places

Middle Preclassic (650 BC–350 BC; Boden Complex)

Social life at the Chan Central Group began in the Middle Preclassic period. As the earliest levels of the Central Plaza were being constructed, the people of Chan were making shell objects and depositing roughly finished shell beads in the plaza fills, in caches, and in a single burial in the middle of the plaza (Burial 1). Worked shell items from the Middle Preclassic period consist entirely of products that may have been manufactured within the community, such as disk beads and perforated shells, and the debris from conch shell working. Although an imported shell raw material (*Strombus*) was worked, Chan shell production and use appears to have been largely self-sufficient in the Middle Preclassic (see discussion below).

Late Preclassic (350 BC–AD 100/150; Cadle Complex)

Beginning in the Late Preclassic period, caching and burial practices in Chan's Central Group shifted focus from the plaza floor to the large east and west structures built to flank the plaza in an E-Group configuration (Robin et al., ch. 6, this vol.). Caches and burials continued to include shell working detritus, particularly the attractive spire ends of conch shells (*Strombus* sp.; see figure 13.1). Of the seven burials dated to the Late Preclassic period, only one contained numerous finished shell artifacts: Burial 16, placed in the west building of the E-Group. This burial was a multiple interment of an adult male and a juvenile aged 5 to 6 years (Novotny, ch. 12, this vol.), beginning a pattern of multiple interment that continued into the Late Classic period at Chan. The individuals in Burial 16 were furnished with 99 tiny whole-shell beads made from spire-lopped dwarf olive shells (*Olivella mutica*), including three dwarf olive shells with cut perforations similar to the typical perforations of larger olive shell (*Oliva* spp.) tinkler ornaments (figure 13.3a). The burial also contained one roughly finished bead made from West Indian fighting conch (*S. pugilis*).

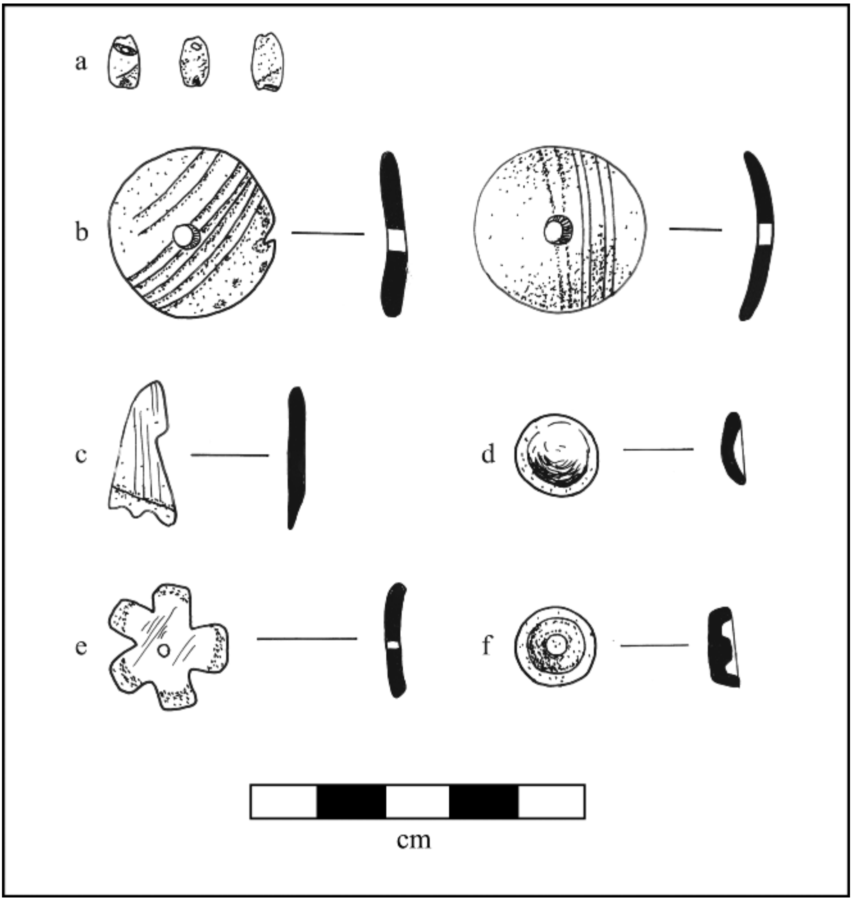

Figure 13.3. Shell ornaments from burials at Chan: (a) *Olivella mutica* beads with cut perforations from Burial 16; (b) perforated disk-shaped shell ornaments possibly worn as ear flares from Burial 2; (c) *Spondylus princeps* frog foot ornament from Burial 3; (d) *S. princeps* saucer from Burial 3; (e) *S. princeps* rosette from Burial 3; (f) *S. princeps* countersunk disk from Burial 3. (Illustrations by Carmen Ting.)

Late to Terminal Preclassic and Early Classic (350 BC–AD 600; Cadle, Potts, and Burrell Complexes)

At the end of the Late Preclassic and into the Terminal Preclassic and Early Classic periods, burials and caches continued to be placed preferentially in the east and west structures of the E-Group. Some burials in this transitional time include shell ornaments, while others contain only unmodified river mussels (*Nephronaias* sp.) and jutes (*Pachychilus* spp.). One important

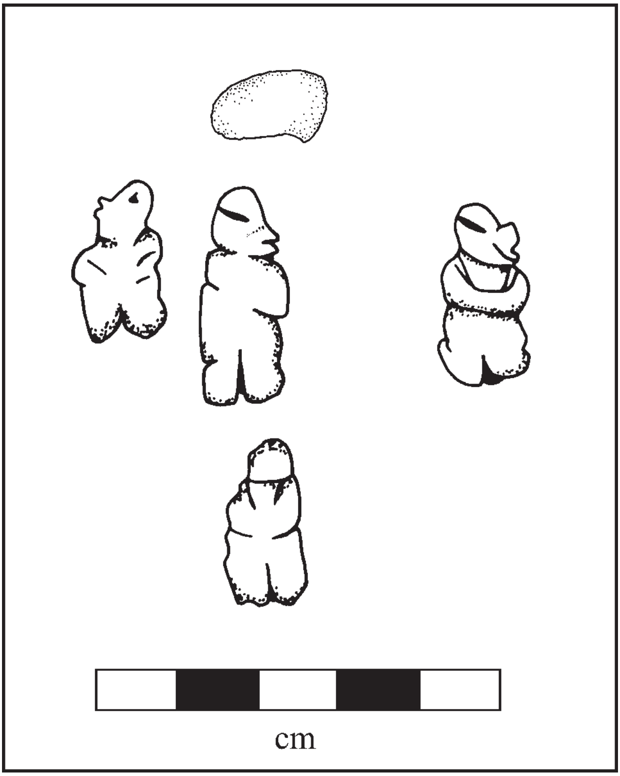

Figure 13.4. Cache 9 cutout figures. Figures were found face down in vessel. The view shown here is looking at the figures from the bottom of the vessel. The central figure is slate, the upper profile is white shell, the lower figure is jade, the left figure is reddish *Spondylus*, and the right figure is yellowish *Spondylus*. (Illustrations by Carmen Ting.)

cache that dates to the transition between the Terminal Preclassic and Early Classic periods is Cache 9, which was found in front of the west structure of the E-Group. To place the cache, the people of Chan dug a hole into bedrock and then stacked two Pucte Brown or Balanza Black basal-flange bowls lip-to-lip. Inside the bowls, excavators found four diminutive anthropomorphic carved figures similar to Charlie Chaplin–type cutout figures but with profile faces (see Moholy-Nagy 1985: fig. 10.8). The figures were made of various colored materials—yellowish *Spondylus*, reddish *Spondylus*, green jade, and black slate—and were arranged with a single white shell profile face in a quincunx pattern at the base of one of the bowls. Together, these items appear to constitute a tiny model of the universe, complete with directional color associations (figure 13.4). In addition to the arrangement of tiny figures, an assortment of minute worked jade, worked *Spondylus*, and polished hematite pieces were recovered from the cache bowls. The hematite pieces may have been part of a mosaic mirror layered in the cache.

At the site of Caracol, Arlene and Diane Chase have found a similar, albeit more elaborate, dedicatory cache (P8B-1), recently reassigned from the Early Classic to the Terminal Preclassic period on the basis of new radiocarbon dates (Chase and Chase 2006: 51). Like the Chan cache, the Caracol cache was placed in that site's E-Group. In the Caracol cache, the Chases found five tiny anthropomorphic figures of the Charlie Chaplin type (one jade, four shell) arranged in a quincunx. The Caracol cache also included a hematite mirror layered under the figurines, along with a host of other precious objects. The Chases interpret this cache as a "cosmogram" intended "to center the building and, by extension, the site of Caracol" (Chase and Chase 2006: 53). With fewer and less costly materials, the people of Chan seem to have effected a similar centering ceremony for their growing community through the placement of Cache 9.

In the Late to Terminal Preclassic periods at the Chan Central Group, burials of individual men contained the greatest quantity and quality of shell items. This is in contrast to other time periods in Chan's history, when multiple interments of men, women, and juveniles were the most richly furnished with shell items. The two burials with the most elaborate shell grave goods at this time are Burials 2 and 10. In the Late Preclassic, Burial 10 was placed in the central east structure of the E-Group with an assortment of shell artifacts. The crypt burial held an adult male, aged 20 to 24 years, accompanied by one river mussel (*Nephronaias* sp.) pendant, one *Spondylus* ornament, and one large whelk (*Busycon* sp.) ornament with asphaltum along one margin, indicating that it had been part of a composite artifact, possibly a headdress or other item of elite costuming. In the Terminal Preclassic, another single male interment, Burial 2, was placed in the northern east structure of the E-Group. In the area of the man's head, excavators recovered a matched set of large, perforated, disk-shaped shell ornaments possibly worn as ear flares (figure 13.3b). Burials 10 and 2 contain the only instances of shell ornaments that might be interpreted as individual identity markers. The specific ornaments interred with each man, a possible headdress piece and matched ear flares, suggest that they were attired in the garb of rulers.

In the Belize River valley and the greater Maya area, the Late to Terminal Preclassic period was one of dramatic growth during which several regional centers became the focus of political authority, and leading families asserted their right to rule (Awe et al. 2009; Marcus 1993; Rosenswig 2009). During this time, emergent rulers across the Maya world attempted to craft distinct identities for themselves as unique individuals with power beyond and outside of traditional kinship ties (LeCount et al. 2004). That this moment in Chan's 2,000-year history is marked by the display of individual elite identity is hardly surprising. What happens in the subsequent Late Classic period, though, is surprising.

Late Classic (AD 600–AD 800/830; Jalacte and Pesoro Complexes)

In the Late Classic period, the Chan populace had access to significantly more finished shell ornaments, most of them probably made elsewhere. Some of those ornaments were placed in burials, but there are no regular age or sex associations with specific shell objects in Late Classic period burials. Men, women, and children are all associated with some shell objects, and none seems to receive better or more shell items consistently. Interestingly, the two Late Classic period burials that contain significant quantities of shell objects are both crypt-style multiple interments, one in the central east structure of the E-Group (Burial 3), and one outside of the community center in the Northeast Group (Burial C5), as excavated by Chelsea Blackmore (ch. 9, this vol.; see also Novotny, ch. 12, this vol.). In treatment and content, these burials echo the earlier multiple interment, Burial 16, placed in the west structure of the E-Group in the Late Preclassic period. In each burial, the most notable shell items are dozens of tiny whole shell beads. Burial 3 contains 322 tiny whole shell beads made from punch-perforated margin shells (*Marginella apicina*), as well as several finely finished shell ornaments including a tiny *Spondylus* frog foot cutout (figure 13.3c), a saucer (figure 13.3d), a rosette (figure 13.3e), and four countersunk disks (figure 13.3f). Burial C5 contained 23 punch-perforated margin shell (*Marginella apicina*) beads and a saucer ornament identical to the one from Burial 3 in the Central Group. The association of multiple shell grave goods with multiple interments is in stark contrast to the burials of the immediately preceding Late to Terminal Preclassic periods, during which we may have evidence for the rise of individual leaders at Chan. In the Late Classic period, the communal burial practices associated with shell offerings seen in the Preclassic reemerged, and Chan's leaders, as distinct individuals, may have been subsumed into the corporate group.

Terminal Classic and Early Postclassic (AD 800/830–AD 1150/1200; Vieras Ceramic Complex and Early Postclassic)

During the Terminal Classic period, the people of Chan began the process of deconsecrating their site. Excavators documented several apparent termination deposits consisting of large quantities of jutes (some burned) in the community center and the leading family residences. The largest of these terminal deposits consisted of 548 jutes and was recovered from a back room of the two-story administrative structure along the south edge of the Central Group (see Robin et al., ch. 7, this vol.). Bernadette Cap (ch. 8, this vol.) identified a similar deposit of 259 jutes below a circular pavement in the West Plaza. Nearby, she also recovered traces of burned resin, possibly burned copal incense from ritual activity.

By the Early Postclassic period, very few people remained in the Chan community. Perhaps the last ritual event in Chan's Central Group was the placement of a cache (Cache 24) consisting of shell, jade, and ceramics. Found just centimeters below the present ground surface, Cache 24 contained what appears to be an entire necklace of eleven heavy *Spondylus* beads and pendants. Considering the paucity of *Spondylus* ornaments from earlier deposits (n=10), this Postclassic cache is surprisingly opulent. The necklace seems to be part of an offering to the community itself, an offering which may be contemporaneous with the breaking of the site's largest stela and the redistribution of its pieces to various points around the Central Plaza (Blackmore 2003: 43).

Shell Craft Production: Making Community

The final mechanism of community construction that I would like to address here is the production of shell craft items at the Chan community in the Preclassic period. In contrast to the extensive literature concerning stone tools and ceramic vessels, studies of shell working in the Maya area are surprisingly scarce (Hohmann 2002: 89–92). Early shell artifact analyses conducted as part of large, site-based research projects were aimed primarily at taxonomic identification and formal description (for example, Coe 1959; Kidder 1947; Moholy-Nagy 1963; Thompson 1939; Willey 1972, 1978; Willey et al. 1965). These studies documented the wealth and diversity of worked shell objects found across the Maya lowlands but did little to advance our understanding of the nature of shell craft production and distribution. The most useful previous considerations of Maya shell craft working are Hattula Moholy-Nagy's (1985, 1987, 1997) studies of craft work at Tikal and Bobbi Hohmann's (2002) analysis of shell ornament production in the Belize Valley. Both researchers comment upon the difficulty of locating shell workshops, because of the common Maya practice of collecting craft debris and redepositing it in middens, structure fills, and ritual contexts like caches and burials. In recent years, archaeologists have begun to analyze shell artifacts with renewed interest, particularly scholars working in Belize (for example, Cobos 1994; Cochran 2006; Dreiss 1994; Hohmann 2002; Isaza Aizpurúa 1997, 2004; Isaza Aizpurúa and McAnany 1999; McKillop and Winemiller 2004; Pope 1994; Trachman 2006).

During the analysis of the Chan shell collection, we were surprised to find a small but significant quantity of broken conch shell (*Strombus*) pieces, including columella, spire, lip, and body fragments interpreted elsewhere as evidence for shell craft production (Hohmann 2002; Moholy-Nagy 1997). We do not have evidence for the extensive manufacture of shell items from freshwater species, although a few freshwater ornaments were found in the Chan collection (see Isaza Aizpurúa and McAnany 1999). The marine shell-working detritus is concentrated in the Central Group, most of it coming from floor fills in the Central Plaza and from the structure fills of Structure 2 (the leading family residence), Structure 3 (an associated ancillary structure), and Structure 7 (the west structure of the E-Group), all along the north and west side of the Central Plaza. Interestingly, several of the burials in the west structure of the E-Group contained shell-working detritus as grave goods, whereas none of the burials from the east structure did. Most of the detritus was recovered from Middle to Terminal Preclassic contexts. At Chan, shell craft production was most likely carried out during the Preclassic on a small scale by the leading families in the Central Group for distribution across the entire community (see Inomata 2001, 2007).

All of the shell-working materials in the Chan shell collection are identifiable as conch of the genus *Strombus*, and most can be further identified as West Indian fighting conch (*Strombus pugilis*). In her analysis of shell working at the sites of Pacbitun and Cahal Pech, Bobbi Hohmann (2002; see also Powis et al. 2009) also found a significant quantity of *S. pugilis* and noted that most of the shell-working materials were recovered not from use locations but from secondary deposits in structural and floor fills. Hohmann identified partially finished items, finished ornaments, and stone drills associated with shell working. At Chan, we recovered partially finished items and finished ornaments from fill contexts but have recovered no shell-working tools as yet, because the lithics from the relevant contexts

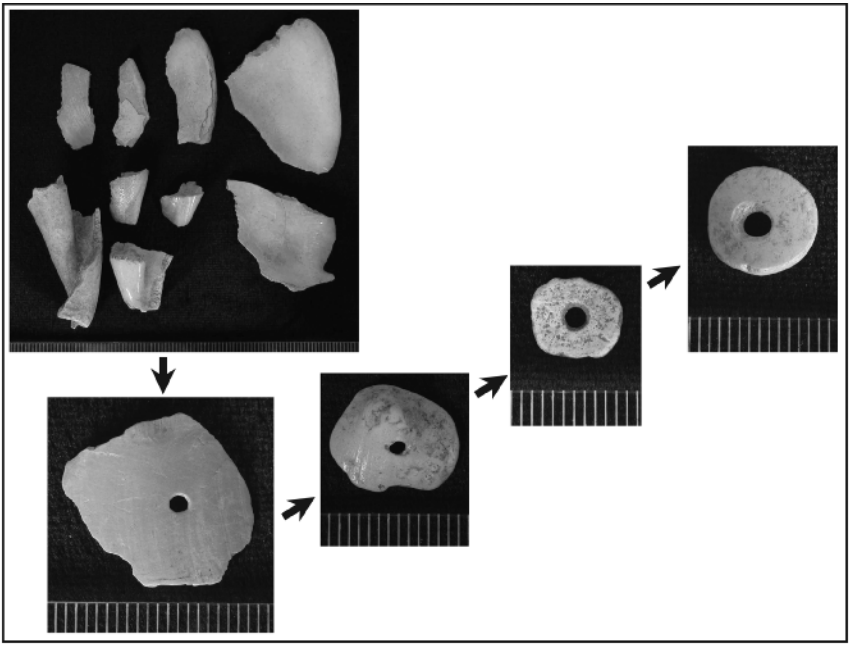

Figure 13.5. *Strombus* sp. shell bead production sequence. (Photographs by Angela Keller.)

have not been analyzed. Nevertheless, the shell materials suggest that some individuals, most likely members of Chan's leading families, were working *Strombus* shell in the Preclassic. The actual shell craft work may have occurred within the western portions of the community center, where excavators recovered several pieces of worked shell and detritus in humus and fill layers.

The Chan shell workers produced simple ornaments like perforated shell fragments and disk beads. The probable process of disk bead manufacture is reasonably well illustrated by the collected shell materials (figure 13.5). The first step was simply to break the shell into manageable pieces and then roughly chip those pieces into the desired shapes. Next the chipped pieces were perforated, typically from the interior of the shell. Finally, some of the perforated pieces were shaped and ground into round disk beads, most of them being finished individually, rather than being strung and ground in batches as is typical in California, the U.S. Southwest, Africa, and Melanesia. Apparently, not all perforated shells were considered blanks for bead manufacture, and some were distributed as is to surrounding households (Robin 1999).

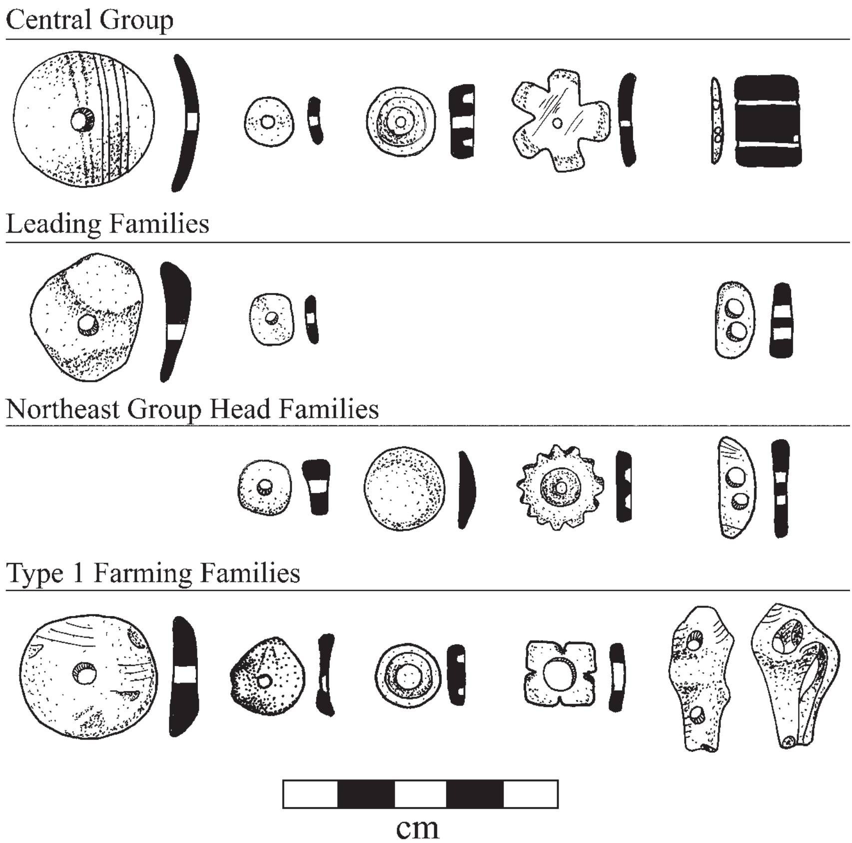

Figure 13.6. Examples of shell ornaments distributed across the Chan community. (Illustrations by Carmen Ting.)

Although the Chan shell-working collection is similar in composition and recovery contexts to Hohmann's Pacbitun collection, the two collections differ dramatically in scale. From Pacbitun, Hohmann (2002: 169) recovered 1,463 pieces of detritus, whereas we have only 106 pieces of *Strombus* spp. detritus from the Chan community (55 columella pieces, 7 spires, and 44 other fragments). Chan shell working appears to have been a low-intensity activity, sufficient only to meet the needs of the community itself. This craft work was likely aimed at the creation of small perforated shell items of varying degrees of fineness for the express purpose of distributing them to the surrounding community. Perforated shells and disk beads, most likely made in Chan's Central Group, were found at both low-status (type 1) and high-status (type 5) households (Robin 1999; Blackmore, ch. 9, this vol.).

The present data suggest that shell working at Chan dramatically diminished, or was absent altogether, in the Late Classic period. At that time, Chan's leaders apparently began to distribute fine worked shell items produced elsewhere. These new distributed items include countersunk disks, rosettes, unperforated saucers, and an unusual toggle-bead type. Nevertheless, these ready-made shell items, like the simpler homemade items of the Preclassic period, speak more to group identity across the Chan community than to discrete personal identities. Most noticeable is the limited repertoire of ornamental forms, as well as the distribution of similarly fine items across status lines at higher- and lower-status households (figure 13.6).

Conclusion

Through the consumption of locally available shellfish and the manufacture, distribution, and use of worked shell items, the people of Chan defined, in part, the social landscape of their community. Over the 2,000 years of Chan's history, the broad pattern of shell use suggests a communal sense of identity and wealth, with the majority of the shell artifacts coming from large-scale feasting debris, multiple interments, and public caching and termination events. Only in the Late to Terminal Preclassic do we see individuals rise out of the communal world to claim specific prerogatives, such as the right to wear particular types of shell ornaments. At that time, Chan would have been one of a handful of civic-centers in the upper Belize River valley with an E-Group. That Chan, ultimately, did not ascend to regional prominence is suggested by the relatively small scale of the center's architecture through the Classic era. The apparent lack of very-fine shell items exclusive to Chan's leading families during the Late Classic period suggests something of the material choices that the Chan leaders must have made as they negotiated their position relative to the rest of the community. What they had, they gave: first in communal feasts of jutes and in gifts of small perforated shell ornaments and, ultimately, in the finest shell goods that they could procure.

Nevertheless, the Chan community should be understood not as a failed regional power but rather as a successful communal endeavor. Viewed closely, the Chan community appears akin to Yucatecan colonial-era communities as described by Nancy Farriss (1984). In these colonial communities, certain families with deep historical roots claimed an elite status and were tasked with maintaining the sacred knowledge, traditions, and history of the community as a whole. In return for their service, these families were provided with goods, services, and labor for large communal endeavors. The apparently inequitable relationship between colonial period elites and their subject communities was conceptualized not as coercive but as collective and mutually beneficial. Nancy Farriss (1984: 351) argues that "the benefits the *macehuales* [commoners] derived from their contribution to the collective enterprises organized and directed by the elite were far from trivial. For they included life and all that was needed to sustain it" (see also Freidel 1992: 129). I would suggest that the distribution of shell materials at Chan may reflect a community based on similar principles of constrained authority and communal benefit (see McGuire and Saitta 1996). That such small-scale communal communities existed in the Classic period alongside hegemonic polities with divine rulers is an unusual proposition, but one that is supported by the collected archaeological materials at Chan.

Ralph Roys's (1957) seminal investigation of Yucatecan political geography indicates that the type of communal community described by Farriss in the colonial period, and suggested for Chan through much of its history, was present in Postclassic Yucatan alongside other political configurations, such as *multepal*-style confederations and kingdoms ruled by individual lords claiming divine sanction. The diversity and number of political configurations in Late Postclassic Yucatan is typically understood as a product of the collapse of earlier hegemonic powers. That is, political diversity is seen as aberrant, late, and unlike the earlier Classic period political world. Our work at Chan suggests that the diversity of political constellations and assertions of authority identified by Roys (1957) in Late Postclassic Yucatan were not necessarily a late invention but possibly a long-standing condition of Maya political and social life.

14

Obsidian Acquisition, Trade, and Regional Interaction at Chan

JAMES MEIERHOFF, MARK GOLITKO, AND JAMES D. MORRIS

Obsidian objects were a part of daily life and ritual events for people across the Maya world. Despite being a long-distance trade item for most Maya-area inhabitants, obsidian is commonly found in all people's homes regardless of status. This chapter presents the results of source origin studies of obsidian artifacts from the agrarian community of Chan. As a wide range of social contexts were explored at Chan, from the homes of humble farmers to those of community leaders and from domestic to ceremonial contexts, the Chan obsidian assemblage allows us to gauge potential variability or homogeneity in people's procurement and use of obsidian across status lines and social contexts in a farming community. Chan's deep 2,000-year history provides an obsidian assemblage with a long temporal range from the Middle Preclassic to the Early Postclassic (650 BC–AD 1150/1200), which allows for an investigation of the often subtle fluctuations of obsidian procurement utilized across the long duration of the pre-Columbian period in the Maya lowlands.

A total of 742 obsidian artifacts were excavated during the 2003 to 2006 excavation seasons at Chan from the community center, leading family residences, and locations in Chan's settlement area including agricultural terraces, a lithic workshop, limestone quarries, and their associated households. Elemental composition analysis was undertaken using a portable X-ray fluorescence (XRF) device to determine geological sources for the entire obsidian assemblage. The portable-XRF's ability to quickly and accurately (and cheaply) assess the chemical composition of Mesoamerican obsidian allowed for a 100 percent sample of this material to be nondestructively analyzed, a feat that was not that long ago unanticipated (Braswell et al. 2000: 270).

The identification of obsidian artifacts' geophysical raw material origin, or "sourcing," functions on the premise that each volcanic flow that yields silicic glass (obsidian) produces distinctive material in regard to its trace element composition. Guatemalan obsidian sources are chemically distinct, so much so that misclassifying an accurately measured artifact is estimated to occur approximately only once in 100,000 cases (4 in 100,000 in regards to Mexican obsidian), thus resulting in a high degree of confidence (Glascock 2002: 614; Cobean et al. 1991).

The goal of this chapter is to elucidate the patterns of obsidian use and procurement at Chan, both temporally and spatially. We will conclude by comparing the Chan results with larger networks and procurement patterns previously identified in the Belize Valley and broader Mesoamerican area. Chan's longevity allows us to examine the impacts of sociopolitical and economic changes ongoing in the Belize Valley, including the rapid florescence and decline of the regional polity capital Xunantunich, and determine what impact they may (or may not) have had on the maintenance of exchange networks that supplied smaller settlements with obsidian.

The Chan Obsidian Assemblage

The Chan obsidian assemblage consists of 742 objects identified across 668 excavation contexts. The assemblage includes blade fragments and blades as well as flake and flake fragments and a single small, 1 cm by 1.2 cm, flat oval obsidian mosaic piece. Excavations at Chan's Central Group, from ritual, administrative, residential, and ancillary contexts, yielded 328 obsidian artifacts; 228 were recovered from the West Plaza; 57 were recovered from the type 5 and type 6 households of the extended families of Chan's leaders (C-002 and C-003) located east of the Central Group; and an additional 16 obsidian artifacts were discovered in post-hole excavations around the Central Group.

In addition, 113 obsidian artifacts came from household and agricultural excavations across the Chan community, including two type 1 and one type 3 farming household, one agricultural area, one type 2 lithic production household, and one type 3 limestone quarrying household. Obsidian artifacts from the midlevel neighborhood at Chan excavated by Chelsea Blackmore (ch. 9, this vol.) and seven type 1 and 2 farming households excavated by Cynthia Robin in 1996 and 1997 were not available at the time of this analysis and thus were not included.

Two fill contexts from the ancillary structures, Structures 3 and 4, adjacent to the leading family residence at the Central Group, which date to the Early Classic and Late Preclassic, respectively, contained debitage related to core maintenance activities, suggesting low-intensity pressure blade production (Hearth 2008). The mosaic piece was part of a Terminal Classic terminal deposit found at the base of an interior staircase in Structure 6, Chan's administrative building (Meierhoff and Miller 2005).

Methods

Analysis was conducted at the Elemental Analysis Facility (EAF) at the Field Museum of Natural History, Chicago, using an Innov-X Systems Alpha portable X-ray fluorescence device. X-rays are produced using a tungsten target and are collected by a Si PIN diode detector, with an energy resolution of less than 230 eV FWHM at the 5.95 keV Mn Kα line. In the present study, the fundamental parameters program supplied by Innov-X Systems was used to calculate concentrations, with the instrument set to "soils" mode, which utilizes a 40keV beam voltage and 20μA current to excite the specimen. Data were collected for a total of 60 seconds per analysis, with three analyses performed per archaeological specimen and averaged.

Eight elements—titanium, manganese, iron, zinc, rubidium, strontium, zircon, and niobium—were present at high enough concentrations in most specimens to be measured. Instrument performance was evaluated by running well-characterized pieces of Sierra de Pachuca and Glass Buttes obsidian (Glascock 1999) along with batches of archaeological specimens. The Innov-X Systems fundamental parameters program supplied with the PXRF produces an inaccurate calculation of titanium concentrations in obsidian because of an unaccounted-for spectral interference with barium—consequently, titanium concentrations were omitted from the analysis. Most of the remaining elements measured with high accuracy in the standards and were utilized as parts per million concentration values for analysis. Precision is on the order of 5–10 percent for all elements included in the present study.

Assignments to sources were carried out by comparison to published data for Central American obsidian sources collected at Northwest Research Obsidian Laboratory (NWROL, www.obsidianlab.com) and Missouri University Research Reactor (MURR) (Cobean et al. 1991; Glascock 2002; Glascock, Elam, and Aoyama 1990; Glascock, Braswell, and Cobean

1998). Published values were corrected to better match data collected at the EAF by comparison of measurements on Sierra de Pachuca and Glass Buttes obsidian standards measured at all three laboratories (Glascock 1999). Mid-Z elements (Zn, Rb, Sr, Zr, Nb) were found to be generally comparable across several orders of magnitude (Sr was not measured at MURR, however), while Mn and Fe concentrations compare well between our data and that collected at NWROL and MURR after correction.

Results

Six distinct compositional groups were identified among the archaeological specimens. Groups 1 (*N*=263), 2 (*N*=102), and 3 (*N*=373) contain all but four of the analyzed specimens, and comparison of these to XRF data obtained from Northwest Research Obsidian Laboratories for the three primary Guatemalan sources utilized by the Maya confirms the archaeological specimens in groups 1–3 as originating at the Ixtepeque, San Martín Jilotepeque, and El Chayal obsidian sources, respectively (table 14.1).

The remaining three chemical groups were then compared to Instrumental Neutron Activation Analysis (INAA) data for other Central American obsidian sources collected at Missouri University Research Reactor, as well as raw material samples from the Sierra de Pachuca source analyzed by XRF at the EAF using hierarchical cluster analysis. As only a limited suite of elements are comparable between the EAF and data generated at MURR, we must stress at present that source assignments made on the basis of comparison to INAA data—particularly in the case of groups 4 and 5—should be treated as tentative.

On present evidence, the single piece of obsidian constituting group 4 is most similar to published data for the La Esperanza source in Honduras—while the group 4 specimen falls outside of one standard deviation of mean concentrations for La Esperanza for most measured elements (table 14.1), cluster analysis places it closer to La Esperanza than to any other commonly utilized Mexican, Guatemalan, or Honduran obsidian source. The two specimens included in group 5 are most similar compositionally to the Paredón source in Puebla, Mexico, and generally overlap at the one standard deviation level with published source data.

The single piece of group 6 obsidian can be confidently assigned to the Sierra de Pachuca source in Hidalgo on both visual and chemical evidence: not only is the specimen greenish in coloration, it is characterized by high iron, zircon, and zinc concentrations characteristic of peralkaline

Table 14.1. Comparison of obsidian source data collected from Chan and other Central American sites

Source data[a]		Ti	Mn	Fe	Zn	Rb	Sr	Zr	Nb
Chan artifacts									
Source 1	mean	1,408	325	11,595	33	125	175	191	16
	σ	278	73	2,589	6	16	21	22	6
Source 2	mean	953	330	7,301	36	132	202	121	12
	σ	112	33	792	7	9	14	10	3
Source 3	mean	964	404	6,050	40	174	161	119	14
	σ	158	66	885	7	18	16	13	5
Source 4	mean	759	207	7,052	26	141	45	142	10
	σ	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Source 5	mean	581	222	9,740	65	201	9	237	39
	σ	23	14	6	2	1	1	4	2
Source 6	mean	1,323	645	16,523	232	215	2	975	64
	σ	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Artifacts from other sites									
Ixtepeque	mean	1,143	219	7,954	35	103	156	164	11
(NWROL)	σ	300	42	2,025	4	15	6	4	2
San Martín	mean	715	241	4,821	44	114	184	107	9
(NWROL)	σ	164	41	1,054	6	5	8	4	2
El Chayal	mean	753	311	4,977	42	150	150	109	11
(NWROL)	σ	81	30	611	6	5	4	2	2
La Esperanza	mean	n/a	253	9,010	39	171	n/a	156	n/a
(MURR)	σ	n/a	5	266	1	1	n/a	18	n/a
Paredón	mean	n/a	216	11456	68	188	n/a	224	n/a
(MURR)	σ	n/a	5	371	10	3	n/a	17	n/a
Pachuca	mean	1107	870	13274	212	202	2	931	76
(EAF)	σ	83	36	492	7	5	0	14	3

a. Chan source data compared to published Central American obsidian source data published by Northwest Research Obsidian Laboratories (NWROL) and Missouri University Research Reactor (MURR), corrected to match Sierra de Pachuca obsidian standards established by Elemental Analysis Facility (EAF).

obsidians. Although it falls at the high end of concentrations measured in source samples from Pachuca at both MURR and the EAF, the pieces analyzed at the EAF come from only one location within the volcanic flow at Sierra de Pachuca and in all likelihood are not representative of the full range of concentrations found within the Pachuca source. The data generated at MURR provide a much better estimate of the true limits of chemical variability in the Pachuca source, and the group 6 specimen does fall within two standard deviations of the mean values measured at MURR and well outside of two standard deviations from mean values for Rb and Zr concentrations characteristic of other peralkaline sources in Mexico (Tulancingo, Rancho Tenango, and El Paraiso).

The San Martín Jilotepeque source is located approximately 310 km from Chan and was utilized by Paleo-Indian populations over 10,000 years ago (Cobean et al. 1991: 77). San Martín Jilotepeque obsidian was by far the predominant source of obsidian artifacts in the Maya lowlands during the Preclassic. Obsidian from the San Martín Jilotepeque source was widely distributed into the Late Classic, being found in sites along the Pacific coast, and in diminishing concentrations north into Chiapas, Mexico, as well as the southern Maya lowlands (Cecil et al. 2007). El Chayal obsidian (located approximately 280 km from Chan) quickly replaced the apparently loosely controlled San Martín Jilotepeque as the dominant source during the Classic period in much of the southern lowlands, possibly due to the emergence of the Kaminaljuyu polity, 20 km from the source (Fowler et al. 1989). Ixtepeque obsidian (located approximately 300 km from Chan) became a dominant source in the lowlands during the Terminal Classic and Postclassic periods. An excellent material for the production of prismatic blades, Ixtepeque obsidian constituted nearly 100 percent of the assemblage of obsidian artifacts from the major ceremonial center of Copan (Aoyama 1999: 19).

Perhaps the most distinctive Mesoamerican obsidian because of its green color, Pachuca obsidian (located approximately 1,070 km from Chan) was the major source of obsidian for several major Central American cultures, including Teotihuacán, Tula, and Tenochtitlán (Cobean et al. 1991). Paredón obsidian (located approximately 1,030 km from Chan) was an important resource in Formative Tlaxcalan sites in Central Mexico (Carballo et al. 2007), as well as in the first solely Olmec occupation of San Lorenzo Tenochtitlán (Boksenbaum et al. 1987). Located in the department of Intibuca, Honduras (approximately 320 km from Chan), La Esperanza is a relatively large source that was exploited by shaft mines and surface outcrops by at least the Late Preclassic, and possibly earlier (Sheets et al. 1990).

Central Mexican obsidian has been chemically (and visually in regards to the distinctive green Pachuca obsidian) identified in the Maya area, albeit almost always in small quantities, from the late Middle Preclassic through to the conquest (Moholy-Nagy 2003; Andrews et al. 1989). The presence of Central Mexican obsidian only in the later stage of the Classic period at Chan is also seen at other sites that report low quantities of this exotic material, such as Seibal (Nelson et al. 1978) and San Jose, Belize (EAF Laboratory, unpublished data).

Honduran obsidian has been less systematically studied, but the La Esperanza source appears to have been a moderately large source, procured by extensive mining operations and surface collections by at least the Classic period, but other evidence may indeed push this date back to the Preclassic or even earlier (Sheets et al. 1990). While apparently primarily serving the La Entrada region and the southern Mesoamerican zone, La Esperanza obsidian is found sparingly throughout the southern Maya lowlands. La Esperanza obsidian has been identified in deposits on Wild Cane Cay, a Terminal Classic/Postclassic trading center off the southern Belize coast (McKillop et al. 1988), suggesting further distribution abroad (Moholy-Nagy 2003). The distribution of non-Guatemalan obsidian at Maya sites certainly will become clearer as more assemblages are chemically assessed using new, quick, accurate, and inexpensive sourcing methods and instrumentation such as portable-XRF.

Identification of obsidian from Chan from the three primary Guatemalan obsidian sources utilized by the Maya as well as three non-Guatemalan obsidian sources indicates that Chan was connected to a broad distribution network.

Temporal Variation in the Procurement of Guatemalan Obsidian

Distinct patterns of temporal variation in the concentrations and distributions of geologically distinct obsidian discovered at Maya sites is a widely observed phenomenon throughout the Maya lowlands (for example, Cecil et al. 2007; Dreiss and Brown 1989; Moholy-Nagy 1999). Analysis of 406 of the 742 obsidian artifacts from Chan was utilized to explore temporal variation in obsidian procurement at Chan. The 82 obsidian objects from contexts that were not datable and 140 objects from the humus layer that contained artifacts of wide temporal variability were excluded from this analysis. The 114 pieces of obsidian debitage identified from ancillary Structures 3 and 4 in the Central Group were also excluded. As a large amount of debitage can be produced in the production of a single blade, including this production debitage in our chronological analysis would skew the analysis toward the geological source of the debitage. The majority (98%) of the Early Classic debitage from Structure 3 came from Ixtepeque, the primary source from which Chan's residents acquired obsidian at this time. The majority (95%) of the Late Preclassic debitage from Structure 4 came also from the Ixtepeque source; however, obsidian from the San Martín Jilotepeque source was the dominant material utilized by Chan's residents at

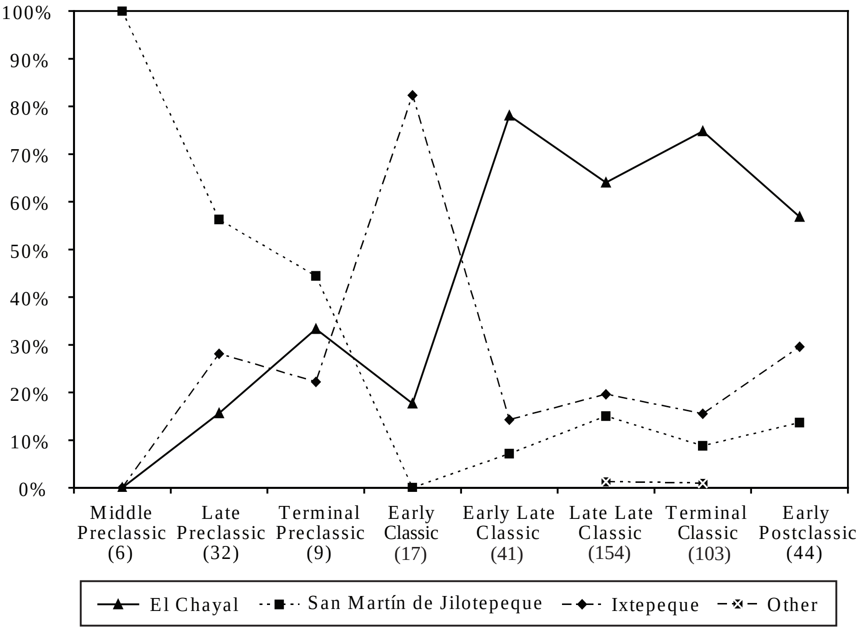

Figure 14.1. Temporal distribution of obsidian sources used at Chan. (Graph by James Meierhoff.)

this time. Laura Kosakowsky (ch. 3, this vol.) undertook the chronological assessment of ceramics from associated contexts that forms the basis of this temporal study of obsidian artifacts.

The temporal distribution of raw material sources utilized for obsidian artifacts at Chan reflects trends that have been previously observed and reported by several scholars in the southern Maya lowlands (for example, Cecil et al. 2007; Dreiss and Brown 1989; Moholy-Nagy 1999), with a few notable differences (figure 14.1). The earliest deposits at Chan that contain obsidian are from the Middle Preclassic and are constituted exclusively of San Martín Jilotepeque obsidian. San Martín Jilotepeque obsidian continues to be the favored material in the Late Preclassic (56%) and Terminal Preclassic (44%); however, other Guatemalan material begins to be imported at this time. Despite low concentrations, San Martín Jilotepeque obsidian is present in all phases of Chan's occupation, constituting between 7 and 15 percent of the overall assemblage through the Early Postclassic. The absence of San Martín Jilotepeque obsidian in the Early Classic at Chan may be the result of low sample size (*N*=17).

Ixtepeque obsidian is first observed in the Late Preclassic but quickly comes to dominate the Early Classic material, with over 83 percent of the assemblage originating from this source. This spike does not include the low-intensity pressure blade production debitage from Structure 3. Were this material included, it would have increased the percentage of Ixtepeque material to over 97 percent of the Early Classic obsidian assemblage, as all but two of the debitage samples were of Ixtepeque obsidian. Ixtepeque quickly falls out of favor at Chan, and by the early Late Classic to the Early Postclassic Ixtepeque obsidian, it makes up only 14–30 percent of the overall assemblage.

By far the most abundant source utilized at Chan, El Chayal obsidian is first imported into the site during the Late Preclassic. After the Ixtepeque spike in the Early Classic, El Chayal quickly becomes the preferred source material at Chan. This continues into later time periods, during which El Chayal obsidian constitutes upwards of 56 percent of the total assemblage until the site was abandoned sometime in the Early Postclassic.

At Chan, San Martín Jilotepeque obsidian is found in greater concentrations in the Preclassic with a steady decline up and through the Postclassic. The Ixtepeque source rises in frequency during the Preclassic to heavily dominate the Early Classic and then be abruptly replaced in importance by El Chayal obsidian in the early Late Classic. El Chayal obsidian remains the most abundant material at Chan until its abandonment.

Given the large obsidian sample empirically tested at Chan, our research expands the available data sets on obsidian procurement at lowland sites, enabling us to elucidate larger issues of obsidian trade routes and networks across the Maya area and other important chronological questions. The obsidian procurement patterns at Chan generally conform to the southern lowland pattern identified at Central Petén sites as well as sites in Belize (Cecil et al. 2007; Rice 1984; Dreiss and Brown 1989; Mckillop 1989; Healy et al. 1984), with two interesting deviations. As noted, at these sites obsidian from San Martín Jilotepeque predominates in the Preclassic period, with a rapid decline and replacement by El Chayal obsidian in the Classic period, which in turn loses favor to Ixtepeque obsidian during the transition into the Postclassic period. An interesting divergence from this generalized pattern is witnessed at Chan with an early and heavy use of Ixtepeque obsidian in the Early Classic (an accelerating trend that begins in the Late Preclassic). This use of Ixtepeque in the Terminal Preclassic and Early Classic coincides with the small-scale obsidian production debris of predominantly (97%) Ixtepeque origin in an era of decreasing San Martín Jilotepeque and increasing El Chayal obsidian usage. While heavy Ixtepeque usage in the Early Classic is seen at sites much closer to the geological source, such as

Copan (Aoyama 1999), Ixtepeque obsidian's most dominant presence in the Belize and Petén sites is in Postclassic deposits.

Terminal Classic and Early Postclassic obsidian procurement at Chan also deviates from the southern lowland pattern, as El Chayal obsidian remains the dominant source utilized at these times. At several Central Petén sites, Ixtepeque emerges as the dominant obsidian source in the Terminal Classic and Early Postclassic, and this result was recently reaffirmed using portable-XRF in the Central Lakes region (Cecil et al. 2007). Likewise, on the southern Belize coast, at Wild Cane Cay, there is an astonishing 1,082 percent increase in the use of Ixtepeque obsidian in the Postclassic compared to the Classic period (McKillop 1989: 45). However, the prevalence of El Chayal obsidian in Terminal Classic and Early Postclassic deposits is also reported at other sites, such as Colha (Brown et al. 2004), Seibal (Nelson et al. 1978), and Uxmal (Nelson et al. 1983); however, the sample sizes from these sites are relatively low. In contrast to McKillop's data on Wild Cane Cay, Chichen Itza's island trading post Isla Cerritos contained a higher percentage of El Chayal to Ixtepeque obsidian in Postclassic deposits, (although Mexican sources were by far the dominant source at Isla Cerritos at this time [Andrews et al. 1989]). This is true also in the Terminal Classic at island sites in northern Belize, as seen at the San Juan site on Ambergris Cay (Guderjan et al. 1989). While Ixtepeque remained a significant source at San Juan (9%), El Chayal dominated (73%) the assemblage in the Late and Terminal Classic. This resembles the obsidian distribution at Chan, where in the Late Classic 75 percent derived from El Chayal and 16 percent from Ixtepeque. Likewise, in the Terminal Classic at Chan, 64 percent of the obsidian assemblage was from El Chayal, while 20 percent was from Ixtepeque. This further supports differing routes, and therefore patterning, of Mesoamerican obsidian acquisition behavior.

Terminal Classic and Early Postclassic obsidian patterns at Chan are comparable to those seen at Colha, Seibal, Uxmal, San Juan (Belize), and Isla Cerritos's Guatemalan assemblage. The combined data from these sites suggest broad regional differences in supply networks in the Guatemalan highlands during the politically tumultuous times at the end of the Classic period.

Social Context of Guatemalan Obsidian Distribution and Use

The geophysical sourcing of obsidian artifacts utilized at Maya sites should not be considered an end in itself (Moholy-Nagy 2003; Brown et al. 2004).

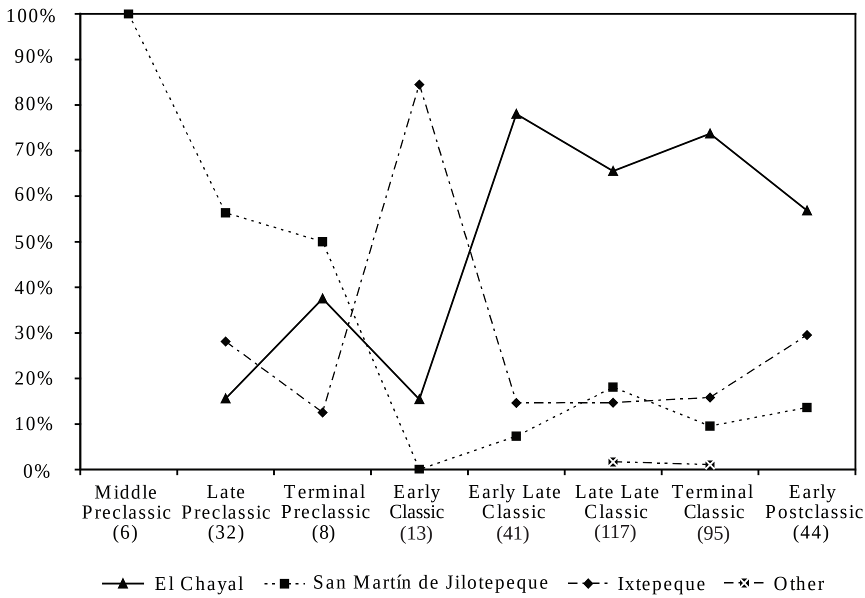

Figure 14.2. Obsidian source distribution at Chan's community center. (Graph by James Meierhoff.)

The extensive excavations at Chan, in conjunction with portable-XRF's ability to easily analyze a 100 percent sample of artifact assemblages, allow for a detailed investigation into obsidian source distribution and acquisition within discrete social contexts at the community. At Chan, the pattern of source acquisition in distinct social contexts remains largely consistent with the pattern seen for the overall site. No one social group or socioeconomic or political context was receiving or using a preferred source of Guatemalan obsidian. To explore this point, we compare obsidian source distribution from Chan's community center and settlement area households, leading family households and settlement area households, and ceremonial and household contexts in general.

The pattern of source acquisition in the community center, including community center domestic and nondomestic contexts (*N*=356), parallels the overall source acquisition pattern for the community (figure 14.2). San Martín Jilotepeque dominates the Preclassic and is replaced by Ixtepeque in the Early Classic. By the early Late Classic, El Chayal is the dominant source and it remains the most utilized obsidian source until the Early Postclassic.

The settlement area household contexts (*N*=50) display the same general pattern of source acquisition as the community center contexts (figure 14.3).

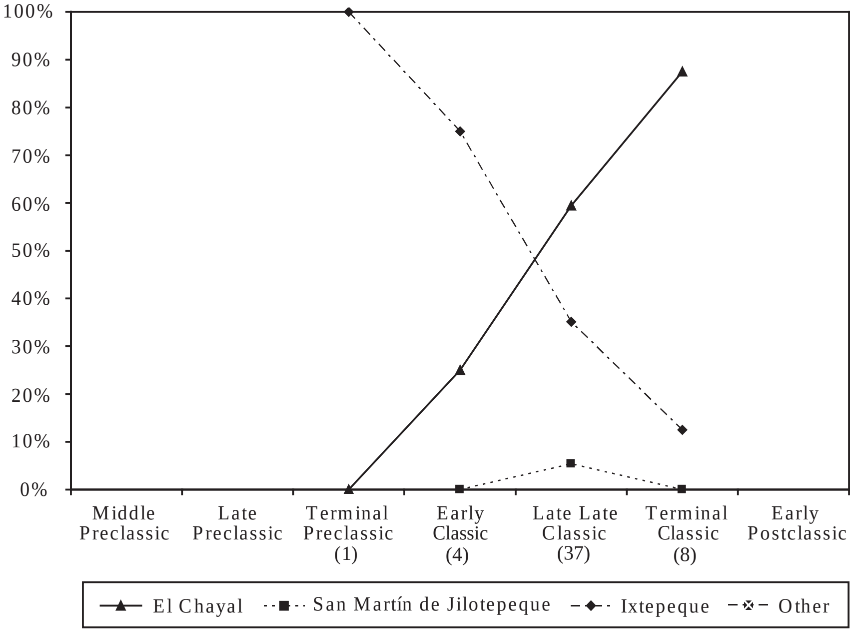

Figure 14.3. Obsidian source distribution at settlement area households. (Graph by James Meierhoff.)

As the settlement area household contexts included in this analysis date to the Terminal Preclassic to Terminal Classic time periods, obsidian acquisition for settlement area households can be explored only for these time periods. Still, the dominance of the Ixtepeque source in the Early Classic and the increasing importance of El Chayal in the Late Classic onwards is evident.

Guatemalan obsidian from the leading family residence and associated ancillary buildings in the Central Group and the residences of their extended families located just to the east of the Central Group (*N*=128) shows the same pattern of source acquisition as seen at the community as a whole and at lower-status settlement area households (figure 14.4). In terms of Guatemalan obsidian sources, there are no status differences in source acquisition for families at Chan.

Although there were no source acquisition differences between leading family households and settlement area households, in regard to Guatemalan sources, leading family households had more obsidian objects than settlement area households did. The volume excavated from the three leading

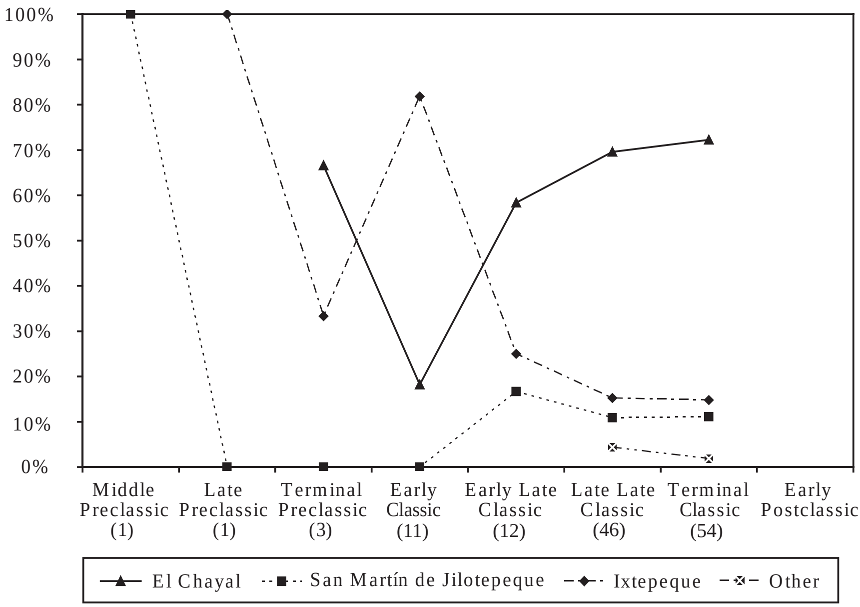

Figure 14.4. Obsidian source distribution at leading family households. (Graph by James Meierhoff.)

family household contexts was 115.25 m^3 and yielded 0.399 pieces of obsidian per m^3. The five settlement area households had a combined 165.84 m^3 of material excavated and yielded 0.22 pieces of obsidian per m^3. The leading family's households thus had approximately 82 percent more obsidian than households in the settlement area in terms of volume of excavated material. While households of all status levels at Chan had access to obsidian from the same sources, the higher-status households of Chan's leading families had access to more obsidian objects than did other households in the community.

Just as all status groups at Chan had access to the same Guatemalan obsidian sources, obsidian used in ceremonial and domestic contexts at Chan came from comparable Guatemalan sources. There was no preferential use of particular Guatemalan sources in ceremonial life when compared to daily life. This pattern is visible by comparing obsidian from ceremonial contexts (figure 14.5) and obsidian from domestic contexts (including both leading family and settlement area households; figure 14.6).

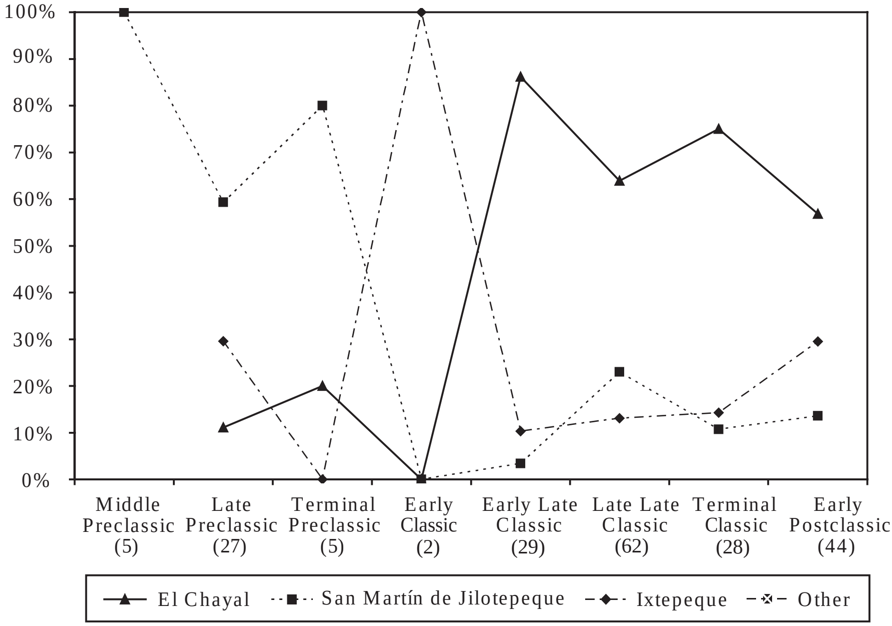

Figure 14.5. Obsidian source distribution in ceremonial contexts. (Graph by James Meierhoff.)

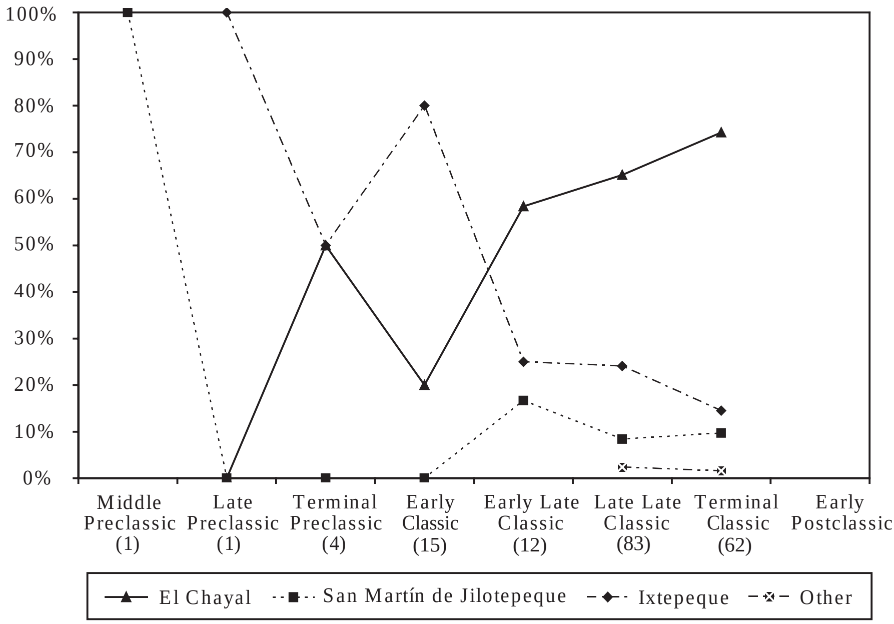

Figure 14.6. Obsidian source distribution in domestic contexts, including leading family and settlement area households. (Graph by James Meierhoff.)

Chan's Leading Families: Obsidian Procurement and Production

The only place where low-intensity pressure blade production was identified at Chan was a secondary deposit in the architectural fill in the ancillary structures adjacent to the leading family residence in the Central Group. Two temporally distinct production episodes dated to the Late Preclassic and Early Classic periods. This suggests that members of Chan's leading families either possessed the skills for obsidian prismatic blade production or associated themselves with attached specialists or itinerant specialists who may have worked at the ancillary structures beside their residence. Whether through their own skills or the skills of others, Chan's leading families had a direct relationship with obsidian production that no other residents of the community possessed.

Chan's leading families also had restricted access to non-Guatemalan obsidian in the Late and Terminal Classic periods. Three of four non-Guatemalan obsidian artifacts were found in ancillary Structures 3 and 4 adjacent to the leading family residence on the Central Group. All three were blade fragments. Structure 4 contained one of the Paredón samples and the one La Esperanza sample, both dating to the late Late Classic. The other Paredón sample was found in Structure 3 and dated to a Terminal Classic deposit. The sample chemically and visually sourced to Sierra de Pachuca (a small obsidian chunk) was identified in the entryway structure (Structure 8) in the West Plaza and dated to the late Late Classic period.

Regional Influences on Obsidian Acquisition

Given Chan's proximity to the late-flourishing polity capital of Xunantunich, we were especially interested in Xunantunich's possible influence on obsidian acquisition at Chan during its short-lived florescence in the late Late Classic. But the long history of Chan's connections to broad obsidian distribution networks and the ways in which temporal changes in source acquisition reflect broader patterns of acquisition seen at sites across the Maya area imply that Xunantunich had little effect on obsidian acquisition at Chan, either at its rise or after its abandonment, at least in terms of the primary Guatemalan sources utilized by the Maya. There is no disruption or interruption of access to Guatemalan sources during Xunantunich's short political apogee in the late Late Classic period.

Non-Guatemalan obsidian is first identified at Chan during the period of Xunantunich's apogee and continues to be found at Chan as Xunantunich's power wanes in the Terminal Classic. Two interpretations plausibly account for the timing of Chan's leaders' acquisition of non-Guatemalan obsidian.

First, it is plausible that Xunantunich's rulers brought access to Petén-influenced trade networks, which allowed long-distance trade items such as non-Guatemalan obsidian to be introduced into the Belize Valley at this time. Xunantunich's rulers had strong cultural ties with Naranjo, and Xunantunich may have even been ruled for at least a brief time by Naranjo (Ashmore 2010; LeCount and Yaeger 2010; Leventhal and Ashmore 2004). Exotic non-Guatemalan obsidian might be the kind of political gift paramount rulers at Xunantunich would give to local leaders at Chan to win their favor. The small quantity and restricted distribution of non-Guatemalan obsidian in the Maya area could indicate that this material was tightly controlled and only choice pieces were handed down to local leaders at communities such as Chan from representatives of more powerful communities such as Xunantunich. As discussed above, Mexican obsidian was imported into the Maya lowlands since at least the Late Preclassic (Moholy-Nagy 1999); however, none was found at Chan until the emergence of Xunantunich.

No instrumental sourcing of obsidian has been undertaken for the Xunantunich collections, but an expectation of the model that non-Guatemalan obsidian arrived at Chan as political gifts from Xunantunich's rulers is that Xunantunich would have greater access to this material than Chan. If, instead, there was a paucity of this material at Xunantunich as at Chan, the argument could be made that it was equally difficult for Xunantunich's emergent paramount rulers to obtain this material.

Andrew Kindon and Samuel Connell (1999) conducted visual sourcing of the obsidian collections of the Xunantunich archaeological project from Xunantunich and surrounding centers (over 2,700 specimens). Their analysis of obsidian form, mass-size, and color suggests that Xunantunich did not have privileged access to any distinct types of obsidian, nor did it seem to play a centralized role in the procurement, production, or distribution of obsidian in the region. Because of its distinctive green coloration, Kindon and Connell were able to identify Pachuca obsidian in the collections but not other kinds of non-Guatemalan obsidian, which resemble Guatemalan obsidian in their color. Only four pieces of Pachuca obsidian were identified: three from the minor center of Chaa Creek, located 6 km to the northeast of Xunantunich; and one from San Lorenzo, a hamlet 1.5 km from Xunantunich. No Pachuca obsidian was identified from Xunantunich. The absence of Pachuca obsidian at Xunantunich may be the result of the paramounts' inability to obtain such items or may indicate that the limited amounts of foreign exotics that its rulers managed to obtain were needed to gift to local, long-established leaders in the Belize Valley. Regardless, Xunantunich's rulers do not seem to have had a special claim on the distant trade networks that brought Pachuca obsidian into the Belize Valley.

It is also plausible that Chan's leaders drew upon their long-standing regional trade relations, expanding connections established over the centuries, to obtain non-Guatemalan obsidian during the late Late Classic and Terminal Classic periods. These trade relations may have involved long-standing relationships with others of the powerful centers in the Belize Valley who had lost power relative to Xunantunich in the late Late Classic period. Chan was involved in broad distribution networks of Guatemalan obsidian for centuries before the rise of Xunantunich, and Xunantunich's rise had no apparent effect on this aspect of Chan's obsidian trade relations. Chan's leading families historically played a special role in the relationship to obsidian at the community, as they occupied the only households within which obsidian objects were produced. While this production may have derived from their own skills, it also plausibly involved attached or itinerant craft specialists who would have provided Chan's leading families with further access to obsidian networks. Continued access to non-Guatemalan obsidian at Chan in the Terminal Classic period as Xunantunich's power was waning also supports an interpretation that Chan's leading families' association with non-Guatemalan distribution networks was not mediated by Xunantunich.

As shown in this chapter and elsewhere (for example, Cecil et al. 2007), the promise of portable-XRF as a (relatively) inexpensive, nondestructive, and accurate method to test large samples of archaeological obsidian quickly (even in the home countries, foreign museums, or sites where they are stored) will add to the growing database of elemental compositional characterization of obsidian, thus elucidating a fine-grained view on obsidian procurement, utilization, and long-distance trade throughout the Maya world and beyond.

Conclusion

For 2,000 years, Chan was involved in broad distribution networks of obsidian. Chan follows the general Maya lowland pattern with San Martín Jilotepeque obsidian being predominant beginning in the Middle Preclassic, to be replaced in preference by El Chayal obsidian in the later stages of the Classic period. Ixtepeque obsidian, while present in all stages of Chan's development beginning in the Late Preclassic, interestingly does not obtain precedence in the Terminal Classic and Postclassic but instead is found dominating the Chan assemblage in the Early Classic. El Chayal obsidian remains the dominant source utilized at Chan from the early Late Classic up through site abandonment sometime in the Early Postclassic. The dominance of El Chayal in the later stages of the Classic period, as well as the Early Postclassic, is seen at other sites such as Uxmal, Seibal, Colha, San Juan (Belize), and the Guatemalan component of Isla Cerritos's obsidian assemblage, which suggests regional differences in acquisition networks during the politically tumultuous times of the Classic to Postclassic transition.

Chan's leading families had unique access to non-Guatemalan obsidian in the Late and Terminal Classic. As well, they were involved in small-scale blade production in the Early Classic and Late Preclassic. While Chan's leaders had almost twice the amount of obsidian as other residents, access to obsidian from different sources was not restricted, as farmers, stone quarriers, biface producers, and community leaders enjoyed obsidian from the same Guatemalan geological sources.

This chapter presented the results and interpretations of the geochemical sourcing of Chan's obsidian assemblage using a portable-XRF device. This procedure proved to be a quick, inexpensive, and effective means of obtaining the raw material source information for Mesoamerican obsidian. The ability to assess a 100 percent sample of archaeological obsidian from a wide array of social and temporal contexts made possible a detailed understanding of Chan's varied source procurement history. It is hoped that this data set, and others like it, will help elucidate larger networks of trade, production, and interaction in the Maya World.

* * *

Author's Note

To view and reference the individual PPM data for each specimen obtained by PXRF at the Elemental Analysis Facility used in this study, as well as the source data reported from individual labs, please contact James Meierhoff (oxbalamajaw@yahoo.com) or Mark Golitko (mgolitko@fieldmuseum.org).

15

Contextualizing Ritual Behavior

Caches, Burials, and Problematical Deposits from Chan's Community Center

LAURA J. KOSAKOWSKY, ANNA C. NOVOTNY, ANGELA H. KELLER, NICHOLAS F. HEARTH, AND CARMEN TING

The archaeology of Maya ritual has a long history that because of its major reliance on hieroglyphic texts and figural polychromes has focused on the behaviors of the uppermost strata of Maya society with few references to what were often similar social practices on the part of Maya farmers and their communities. The dominant narrative that tends to emerge from this type of approach is one that prioritizes elite control and dissemination of ritual knowledge with little regard for the storehouse of knowledge that households, communities, and local lower-level leaders possessed. Yet ritual activities occurred on every level of society, and community ritual represented a shared worldview or ideational knowledge that was symbolized materially in burials, caches, and other types of offerings. Research at Chan has demonstrated clearly that these ritual practices had their beginnings at the founding of the community in the Middle Preclassic, long before their adoption by the Maya elite of the Classic period, and remained a part of the community's social memory throughout its 2,000-year occupation history (Kosakowsky and Robin 2010; Robin et al., ch. 6, this vol.).

Types of Deposits

The inhabitants of Chan focused their ritual activities on burials (Novotny, ch. 12, table 12.1, this vol.), caches, and terminal deposits (table 15.1) in their small ceremonial center, with its 5.6 m high east temple, which was part of an E-Group, an architectural complex associated with ritual and ancestor veneration (Robin et al., ch. 6, this vol.). The types of deposits associated with ritual behaviors found at Chan leave material traces that also conform

Table 15.1. Caches and terminal deposits at Chan

Deposit	Time period	Contents
Caches		
Cache 1[a]	Middle Preclassic	Rectangular ceramic, possible *candelero* (1), Reforma Incised sherds, obsidian piece (2), serpentine pieces (15, may be fragments of the same celt), shell beads (3 *Strombus*, 1 *Spondylus*, and 4 unidentified species), *Strombus* perforated piece (1), *Strombus* detritus (10)
Cache 2	Middle Preclassic	Jade mosaic piece (1)
Cache 3	Middle Preclassic	Jade bead (1), reworked jade (1), reworked serpentine (1), serpentine chunk (1), shell beads (3 *Strombus*, 1 unidentified), *Strombus* detritus (1)
Cache 4	Middle Preclassic	Figure head (1), reworked serpentine (1), reworked jade (1), *Strombus* detritus (1)
Cache 5	Middle Preclassic	Reforma Incised sherds, *Strombus* detritus (3)
Cache 6	Middle Preclassic	Jade mosaic piece (1)
Cache 7	Late Preclassic	Miniature Paila Unslipped bowls (7), jade bead (1)
Cache 8	Late Preclassic	Partial Candelario Appliquéd incensario, *Strombus* detritus (1)
Cache 9	Terminal Preclassic/ Early Classic	Lip-to-lip Pucte Brown or Balanza Black basal-flange bowls (2), anthropomorphic cache in quincunx pattern (2 *Spondylus*, 1 jade, 1 slate, 1 *Strombus*), hematite pieces (3, possibly from mirror), jade pendant (1), jade chunk (1), possible broken jade bead (1), *Spondylus* pendant (1), *Strombus* detritus (2)
Cache 10	Early Classic	Hewlett Bank Unslipped bowls (2), *Strombus* detritus (12)
Cache 11	Early Classic	Partial vessel, possible Aguila Orange bowl (1)
Cache 12	Early Classic	Unidentifiable partial bowl with ring base (2)
Cache 13	Early Late Classic	Chert eccentrics (6)
Cache 14	Early Late Classic	Dolphin Head Red Group cylinder vase (1), bowl (1)
Cache 15	Early Late Classic	Partial eroded ridged plate, probably Mountain Pine Red Group (2)
Cache 16	Late Late Classic	Incomplete Mt. Maloney bowl (1)

Cache 17	Late Late Classic	Cambio Unslipped Group censer stand (1)
Cache 18	Late Late Classic	Cayo Unslipped dish (5)
Cache 19	Late Late Classic	Cayo Unslipped dish (2)
Cache 20	Terminal Classic	Cayo Unslipped bowl (5)
Cache 21	Terminal Classic	Sherd disk (1), animal bone (1)
Cache 22	Terminal Classic	Whole chert biface (1), broken chert biface (1), deer antler (2)
Cache 23	Terminal Classic	Whole thin chert biface (1), broken thin chert biface (1)
Cache 24	Early Postclassic	Almost complete unslipped incensario (1) and other incensario fragments, figurine (2), incensario or stove prong (3), jade bead (5), *Spondylus* bead (11)
Cache 25	Early Postclassic	Incensario fragment (1), figurine (1), jade chunk (1)
TERMINAL DEPOSITS		
TD1	Late Late Classic/ Terminal Classic	Large concentration of sherds (Cayo Unslipped and Tu-tu Camp, Dolphin Head Red, Mt. Maloney, Belize Red, other), chert biface (2), feline tooth (1)
TD2	Late Late Classic/ Terminal Classic	Large concentration of sherds (Mt. Maloney, Dolphin Head Red, Belize Red, Cayo Unslipped and Tu-tu Camp, Macal), jade pendant (1), *Strombus* pendant (1), hematite (1), gneiss polishing tool (1), slate tool (1)
TD3	Terminal Classic	Large concentration of sherds (Cambio, Chunhuitz, Belize Red, Cayo Unslipped and Tu-tu Camp, Dolphin Head Red, other), largely from incensarios
TD4	Terminal Classic	Large concentration of sherds (Cayo and Tu-tu Camp, Belize Red, Dolphin Head Red, Cambio, other)
TD5	Terminal Classic	Large concentration of sherds (Cayo and Tu-tu Camp, Belize Red), largely from Uaxactun Unslipped jars, chert nodule (1)
TD6	Terminal Classic	Broken Roaring Creek Red pedestal base reworked as a cord-holder (1), spindle whorl (1), jutes (548)

a. Cache 1 is a composite cache that includes multiple distinct caching episodes that we were unable to sort stratigraphically (Blackmore 2003).

to those found at other lowland Maya sites. Caches are deposits of ritual objects interpreted as offerings that are intentional interments. These are differentiated from burials, which include the interment of one or more individuals together with any associated offerings (Becker 1992; Coe 1959). However, the myriad of what could be ritual deposits encountered in excavation, such as those containing incomplete skeletal remains and other artifacts, scatters of utilitarian objects that may or may not be containerless caches (D. Chase 1988; Moholy-Nagy 1997), irregularly patterned deposits of offered material, or seemingly domestic refuse that has been intentionally deposited in a secondary location, are just some examples that blur the distinction between burials and caches and helped to coin the term "problematical deposit" by the Tikal Project decades ago (Becker 1992; Clayton et al. 2005; Krejci and Culbert 1995; Kunen et al. 2002; P. Walker 1995).

Most importantly, typologies of deposits that include static categories of cache, burial, dedicatory or termination deposits, feasting refuse, or other problematical deposits and that ignore an examination of the artifacts contained within them (Clayton et al. 2005), as well as comparing the material classes to items that are discarded in midden deposits or architectural fills, do not adequately describe the complex and dynamic nature of ritual behaviors and their material traces. In contrast, a contextual-based approach describes all artifact classes, along with architectural and excavation data, in order to better understand the behaviors associated with Maya ritual through time (D. Chase and A. Chase 1998).

Middle Preclassic Boden Complex (650 BC–350 BC)

The earliest evidence of ritual activities at Chan consists of a series of five caches (Caches 1–5) and a single burial (Burial 1) that was reentered prehistorically (Novotny, ch. 12, this vol.), placed in the center of the Central Plaza during the Middle Preclassic. If one measures sacredness of a space or geographic location in terms of the length of time that locus is the site of ritual practices, then the center of Chan's Central Plaza was indeed among the most sacred (Robin et al., ch. 6, this vol.). Ritual activities centered on a site's main plaza have been well documented at other Maya sites during the Preclassic period (Awe 1992; Garber et al. 2004; Hammond 1991; Robin 1989). The five Chan caches were placed in small pits dug into the bedrock in the center of the community (Blackmore 2003), and though whole ceramic vessels were not included in the exceedingly complex stratigraphy of pits, cutting into other pits, a rectangular, unslipped and poorly formed, small ceramic item that may have been a *candelero* was placed in Cache 1 and a single highly eroded fragment of a probable human figurine head was placed in Cache 4. Two obsidian blade fragments, sourced to San Martín Jilotepeque (Meierhoff et al., ch. 14, this vol.), were also found in the fill of Cache 1, along with Reforma Incised (Savana Orange Group) sherds. Three of the five caches contained jade, including a piece from a possible jade mosaic in Cache 2, a jade bead in Cache 3, and pieces of reworked jade in Caches 3 and 4. Three of the five caches contained serpentine, including seven pieces probably from the same celt in Cache 1 and 13 other pieces of reworked serpentine in Caches 1, 3, and 4 (Keller 2008). Four of the five caches also contained worked shell, and two contained detritus from shell working. Cache 1 contained the largest number of shell items, including eight shell beads (3 *Strombus*, 1 *Spondylus*, and 4 unidentified species), one perforated piece of *Strombus*, and 10 pieces of *Strombus* detritus from shell working. Four shell beads (3 *Strombus*, 1 unidentified) were also placed in Cache 3, along with one piece of *Strombus* detritus from shell working, and *Strombus* detritus was found also in Cache 4 (one piece) and Cache 5 (three pieces; Keller, ch. 13, this vol.). A single calibrated radiocarbon date from the earliest levels dates these events to 780–410 BC (2-sigma range). These activities, along with the revisitation of Burial 1 (Novotny, ch. 12, this vol.), provide clear evidence that this was a marked location retained in the social memory (Mills and Walker 2008) of the Chan inhabitants for a long period of time and demonstrate that the practice of ancestor veneration dates back at least to the Middle Preclassic.

A single piece of jade was cached (Cache 6) below the earliest floor of the north structure (Structure 2) of the Central Group, the residence of Chan's leading family (Robin et al., ch. 7, this vol.), and dedicating its initial construction. This piece may be part of the same jade mosaic as the jade cached at the same time in the Central Plaza in Cache 2 (Keller 2008).

Late Preclassic Cadle Complex (350 BC–AD 100/150)

During the Late Preclassic, a single cache (Cache 7) was placed in the center of the Central Plaza, consisting of seven unslipped and poorly made, stacked miniature bowls and a jade bead. This is the only evidence of ritual activity in the center of the Central Plaza during the Late Preclassic, though the location of this cache indicates that knowledge of the prior locations of the caches and the Middle Preclassic burial persisted in community memory.

While caching of artifacts in the Central Plaza at Chan continued in later periods of the community's history, the major focus of ritual activity shifted to the east and west structures of Chan's E-Group during the Late Preclassic. Prior to any masonry construction in the location below what became the northern part of the east structure of the E-Group, an upright stone was set into the plaza floor, oriented along an east–west axis (Kestle 2004). Cached (Cache 8) with it, excavators also found a partial Candelario Appliquéd *incensario*, some sherds with evidence of charcoal and burning, and a piece of *Spondylus* detritus from shell-working; the charcoal from the deposit yielded a calibrated radiocarbon date of 400 to 200 BC (2-sigma range).

Throughout the entire Late Preclassic architectural history of the E-Group, Chan's residents placed a series of burials (Burials 8, 9, 10, 14, 15, 16, and 17) in both the east and the west E-Group structure (Novotny, ch. 12, this vol.; Robin et al., ch. 6, this vol.). The earliest burial in the east structure (Burial 10), a young adult male, has a calibrated radiocarbon date of 400–210 BC (2-sigma range) from charcoal within the fill of the burial.

Of special interest in the mortuary assemblages of the Late Preclassic E-Group burials is the presence of curated Middle Preclassic figurines, a practice identified at other sites in the Belize Valley as well (Awe 1992). In total, eight Middle Preclassic figurine heads have been found, all in later deposits at Chan, within the Central Group. Included in this sample of figurine heads are one in the Central Plaza caches, three in the east structure of the E-Group (one from Burial 10; see figure 15.1a), three in the west structure of the E-Group (one from Burial 17; see figure 15.1b), and one in the north structure, the residence for the leading family. Four Middle Preclassic torso fragments also have been identified: three from the north structure and one from Late Preclassic Burial 14 in the west structure of the E-Group. The earliest burials in both the east and the west structure of the E-Group (Burial 10 and Burial 17 respectively) contained broken Middle Preclassic figurine heads. Laura Kosakowsky has suggested that these figurines represent actual portraiture, and their incorporation in later burials, caches, and fills of sacred spaces may have symbolized members of the founding lineage of the Chan community, who may have been interred within the E-Group (Kosakowsky and Robin 2010). These heirlooms objectified memory and linked Chan's inhabitants to their more distant ancestral past (Lillois 1999).

The second burial interred in the east E-Group structure, Burial 8, dates to BC 50–AD 90 (2-sigma range). Burial 8 was interred with a large chert blade, a jade pendant, and six ceramic vessels (figure 15.2), the most

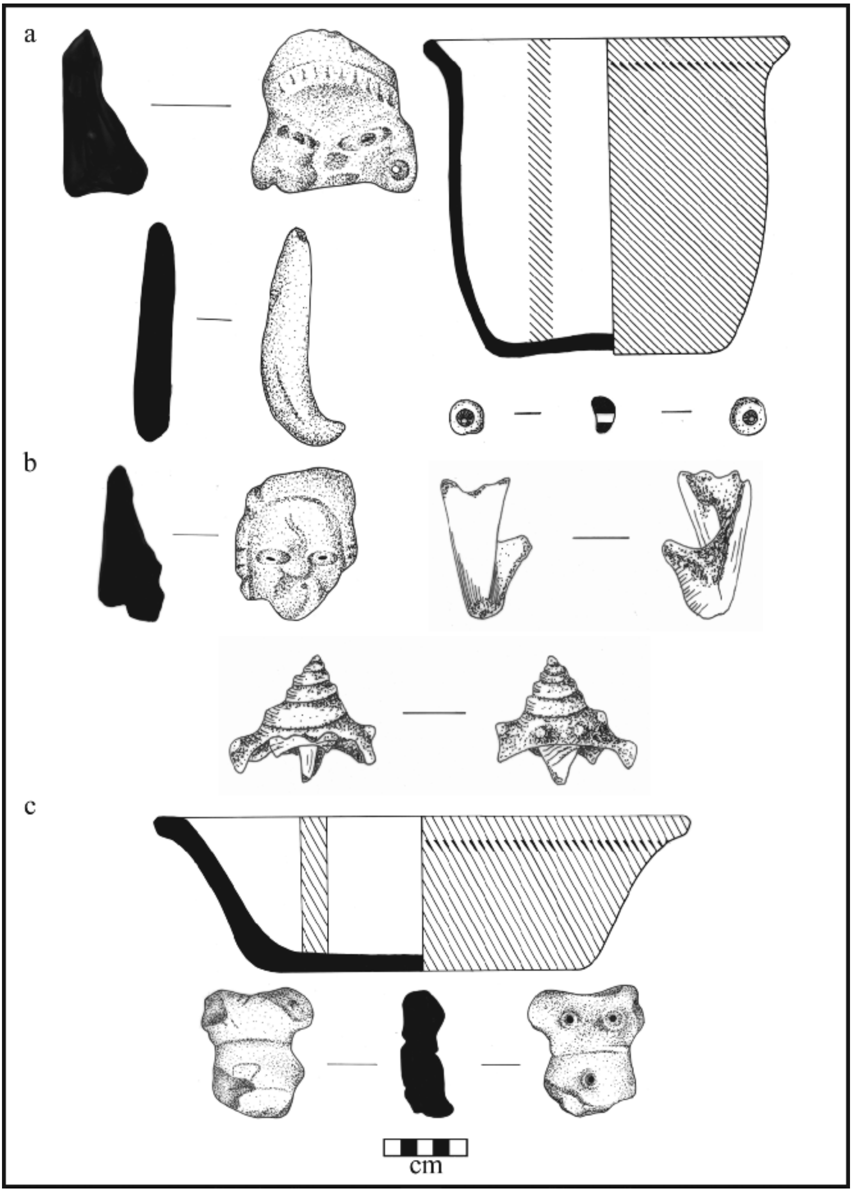

Figure 15.1. Artifacts from Cadle Complex burials: (a) Burial 10: Middle Preclassic figurine head, Sierra Red bucket, *incensario*/stove prong, jade bead; (b) Burial 17: Middle Preclassic figurine head, *Strombus* detritus; and (c) Burial 14: Sierra Red dish, Middle Preclassic figurine torso. (Illustrations by Carmen Ting.)

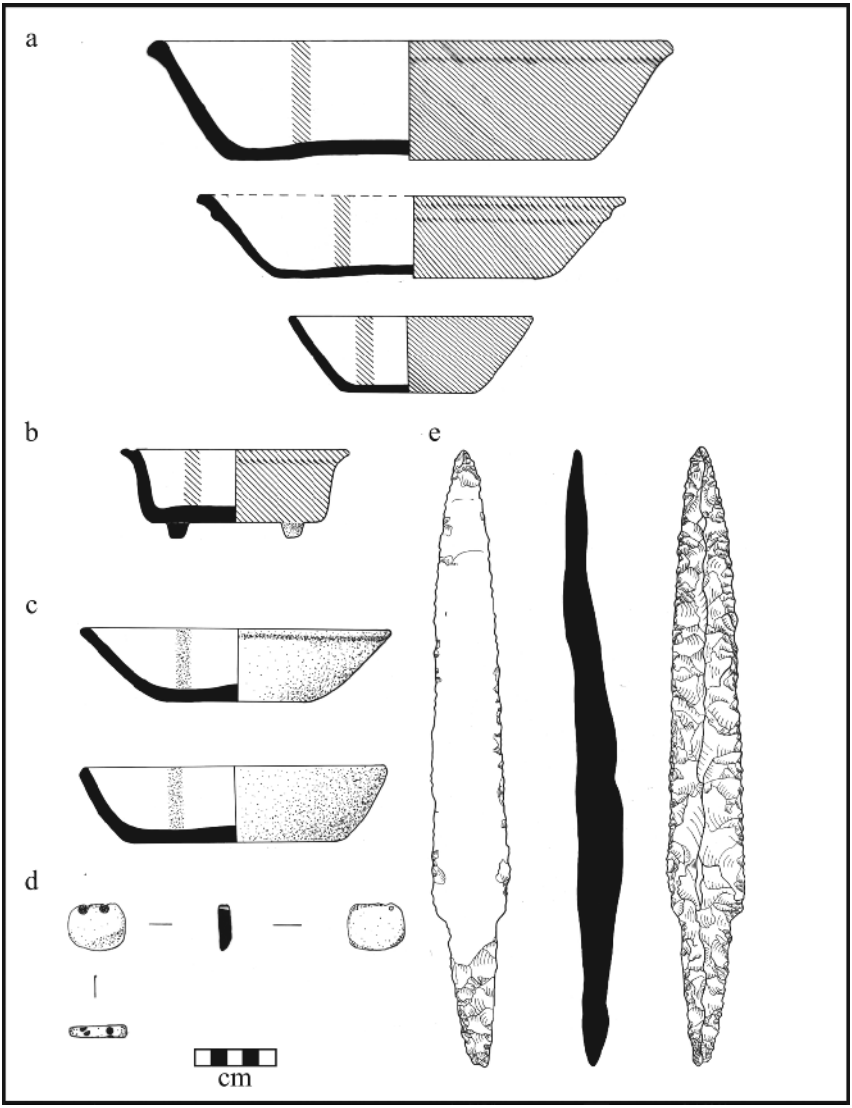

Figure 15.2. Artifacts from Cadle Complex Burial 8: (a) Sierra Red; (b) Hillbank Red; (c) Paila Unslipped; (d) jade pendant; and (e) chert blade. (Illustrations by Carmen Ting.)

ceramic vessels of any burial in the Chan E-Group. The whole vessels include three from the Sierra Red Group (see figure 15.2a), one from the Hillbank Red Group (see figure 15.2b), and two from the Paila Unslipped Group (see figure 15.2c). The chert blade interred with Burial 8 (see figure 15.2e), which is 38 cm long, is honey brown in color and originates from the chert-bearing zone of northern Belize. It appears to be the only chert from

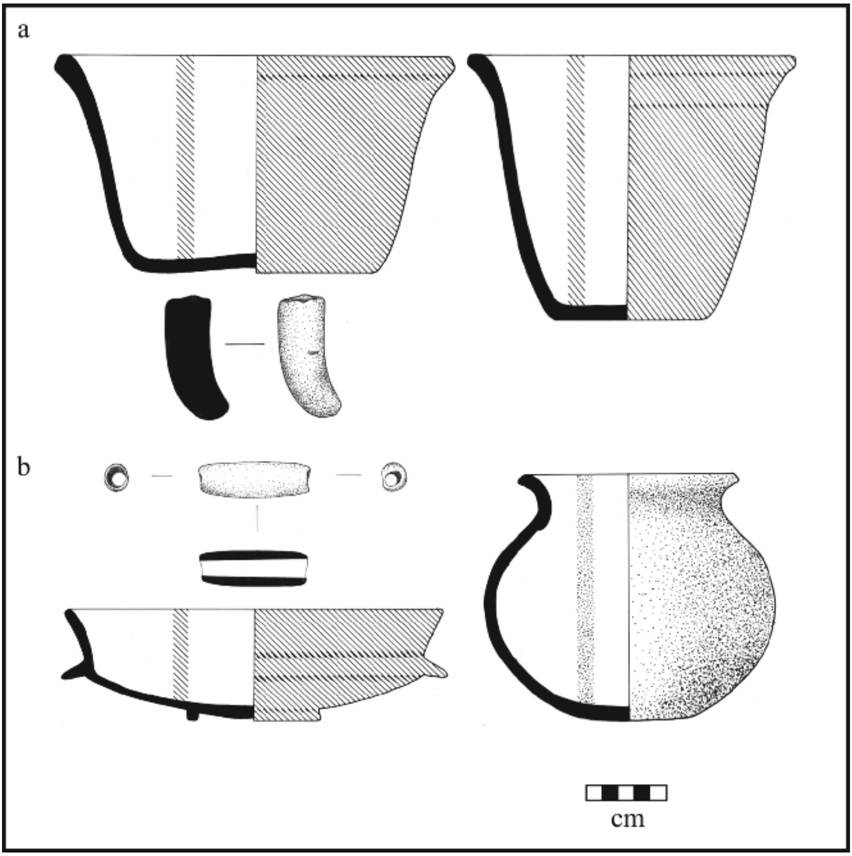

Figure 15.3. (a) Artifacts from Cadle Complex Burial 9: Society Hall Red bucket (*top left*), Sierra Red bucket (*top right*), *incensario*/stove prong (*upper middle*); and (b) artifacts from Potts Complex Burial 6: jade bead (*lower middle*), Cabro Red basal flange bowl (*bottom left*), Paila Unslipped jar (*bottom right*). (Illustrations by Carmen Ting.)

northern Belize in the Chan collection and likely represents a trade item manufactured elsewhere; it shows no signs of visible use-wear (Hearth, personal communication 2009; Kosakowsky and Robin 2010), unlike the ceramics, which were heavily used prior to deposition in the burial. All the vessels interred with the other Late Preclassic burials also show evidence of use prior to deposition, including the Sierra Red and Society Hall Red buckets from Burial 9 (figure 15.3a) and the badly eroded partial Sierra Red dish from Burial 14 (figure 15.1c). A calibrated radiocarbon date from Burial 14 dates from 370 to 110 BC (2-sigma range).

Terminal Preclassic Potts Complex (AD 100/150–250)

The interment of burials containing ceramic grave goods continued in the Terminal Preclassic in both the east and the west structure of the E-Group. Burial 6, interred in the central east structure, produced a calibrated radiocarbon date on carbonized wood from the fill dating from 170 BC to AD 50 (2-sigma range). Grave goods included two vessels—a Paila Unslipped jar and a late Cabro Red basal flange bowl—a quartz crystal, and a jade bead (figure 15.3b). While the radiometric date on this burial places it at least coeval with Late Preclassic Burial 8, if not earlier, its stratigraphic position indicates that it was in fact a slightly later interment, and these two burials probably occurred very close in time during an expansion of the east structure of the E-Group.

At the very end of the Terminal Preclassic, Burial 2 was placed in the northern building of the east structure of the E-Group. A radiocarbon date on carbonized wood from fill places this event at AD 140 to 380 (2-sigma). At about the same time, Cache 9 was placed into a hole dug by Chan's inhabitants into the bedrock in front of the west structure of the E-Group. Within this hole, they placed two basal flange bowls, stacked lip-to-lip, that were very poorly preserved and of the Pucte Brown Group or very poorly executed early Balanza Blacks. Inside, excavators found four diminutive anthropomorphic *duende* figurines that are stylistically similar to the "Charlie Chaplin" type (one yellowish *Spondylus*, one reddish *Spondylus*, one green jade, and one black slate); one white *Strombus* human face profile *adorno*; and an assortment of worked jade, *Spondylus*, and polished hematite pieces (Keller, ch. 13, this vol.). As Angela Keller discusses in chapter 13, the hematite pieces may have been part of a mosaic mirror layered in the cache. The four little figurines and one profile were arranged in a quincunx pattern at the base of one of the bowls, creating a model of the universe complete with color associations.

Early Classic Burrell Complex (AD 250–600)

The Early Classic marks the beginning of a change in the use of ceramic vessels in ritual contexts. A single burial (Burial 12) was placed in the west structure of the E-Group; it produced a bone collagen date of AD 380–550 (2-sigma range). A single burial (Burial 20) was placed below the L-shaped Structure 8 in Chan's West Plaza. A bone collagen date places this event at AD 420–600 (2-sigma range).

Throughout the Classic period, pottery vessels were no longer included as grave goods in burials in the E-Group, although other artifact classes are found in mortuary contexts (Novotny, ch. 12, this vol.). Instead, ceramics were placed as offerings in caches, which become the main focus of ritual at the east and west structures of Chan's E-Group. As identified during the 2004 field season (Robin 2004b; Robin et al., ch. 6, this vol.) and suggested in prior papers (Kosakowsky and Robin 2010; Novotny and Kosakowsky 2009), this represents a shift in focus from ritual associated with specific ancestors to rituals that engaged the Chan community as a whole.

At the end of the Early Classic, three caches (Caches 10, 11, and 12) were placed in the east structure of the E-Group, consisting of partial or poorly preserved vessels placed on a floor at roughly the same time to mark the refurbishing of the lower substructure and staircase. They include a number of open bowls with ring bases that may be poorly preserved examples of Aguila Orange (Caches 11 and 12), as well as two small unslipped "finger bowls" (figure 15.4a, Cache 10) similar to Hewlett Bank Unslipped in the Hermitage Complex at Barton Ramie (Gifford 1976), although the Chan form tends to become more common in the subsequent time period, marking these caches as transitional into the Late Classic. Included in Cache 10 are 12 pieces of worked *Strombus* detritus. A piece of reworked serpentine and one of worked *Strombus* detritus found in the structure fill of steps of the west building of the E-Group, while excavators were cleaning a heavily looted area, may have been part of a cache or a containerless cache dedicating an architectural renovation of the western building, as well.

Early Late Classic Jalacte Complex and Late Late Classic Pesoro Complex (AD 600–800/830)

During the early Late Classic, both caches and burials were placed in the east structure of the E-Group, though none were found in the west structure, likely because of the looting of deposits of these later time periods. Four burials (Burials 3, 4, 5, and 7) date to these periods. As discussed by Anna Novotny (ch. 12, this vol.), Burial 3 was reentered across the early and late Late Classic periods. Three dates could be determined: two from bone collagen on the teeth of Individuals 3.4 and 3.2 are AD 640–760 and AD 680–890 (at the 2-sigma range), respectively; the third, from carbonized wood in fill, dates to AD 770–980 (2-sigma).

Chan's residents placed numerous caches in the east structure of the E-Group during its expansion and renovation. Cache 13 consists of six chert

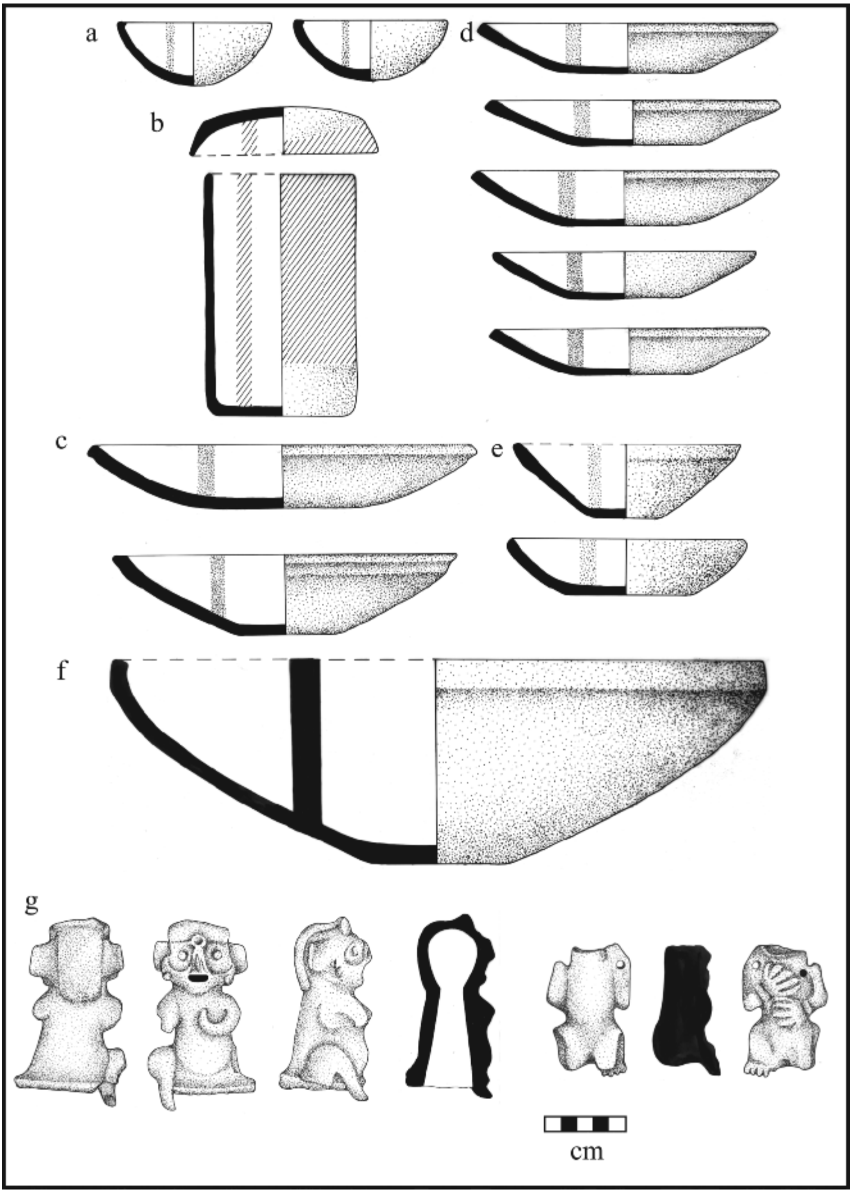

Figure 15.4. Artifacts from Chan's caches: (a) Burrell Complex Cache 10: Hewlett Bank Unslipped; (b) Jalacte Complex Cache 14: unnamed monochrome red vessels; unnamed unslipped vessels from (c) Pesoro Complex Cache 19; (d) Pesoro Complex Cache 18; and (e) Pesoro Complex Cache 20; (f) Pesoro Complex Cache 16: Mt. Maloney bowl; and (g) Early Postclassic figurines from Caches 24 and 25. (Illustrations by Carmen Ting.)

items: three crescents, a ring, a serpent eccentric, and a notched biface, placed on the central axis of the structure near Cache 14 and Altar 3, marking the construction and dedication of the upper structure (Meierhoff et al. 2004). Three are simple crescent forms that according to Meadows (2001: 221) may represent "celestial beings" or "earth maw creatures." All are finely knapped, and one crescent exhibits crystalline inclusions above and below the opening for the notch. The crystals could resemble possible cave stones, and the decision to leave some portion of the crystalline faces on the biface was intentional. The chert ring shows evidence of use wear, possibly from hafting; the eccentric is likely a serpent form; and the sixth is a notched biface (Hearth, personal communication 2009).

Cache 14 was placed in the fill at the center of the ultimate step of the upper structure of the east E-Group structure; it consists of a tall monochrome red cylinder and a mismatched shallow monochrome red dish used as a lid (figure 15.4b). Cylinder vases are uncommon forms in household refuse at Chan, a pattern found also by LeCount (1996, 2001) in her research at Xunantunich, where more elaborate cylinder vases were likely used to drink cacao in celebratory feasting events (Houston et al. 1989; Stuart 1988). Research at other larger sites (Ball 1993; Reents-Budet 1994) has demonstrated that elaborately painted vases were produced by specialists as prestige items and widely traded at the uppermost levels of Maya society to cement sociopolitical relationships. The residents of Chan likely selected this specific vessel form for the caching event that terminated one construction phase of the east E-Group structure and dedicated the new upper structure. Finally, Cache 15 was recovered from the center doorway step leading to the rear bench of the east E-Group structure's superstructure; it contained multiple, highly eroded ridged plates, probably of the Mountain Pine Red Group.

Beginning during the early Late Classic Jalacte Complex and transitioning into the late Late Classic Pesoro Complex, Chan's residents also continued to inter a number of burials in the L-shaped Structure 8 constructed in the West Plaza of Chan's community center. Few grave goods are associated with any of these burials, though Burial 11 contained two pieces of obsidian, both from El Chayal, and Burial 19 contained four pieces of obsidian, also from El Chayal (Meierhoff et al., ch. 14, this vol.). Bone collagen dates on the adult male in Burial 19 place this event between AD 570 and 660 (2-sigma range). The final burial (Burial 18) included a partial limestone biface and a granite ground stone mano. As a group, the grave goods (only chipped or ground stone items were included with these burials) are clearly less elaborate than those associated with the E-Group (Novotny, ch. 12, this vol.).

During the late Late Classic Pesoro Complex, the final ceramic cache (Cache 17), a large unslipped and undecorated incensario stand, was placed upright on the central step leading from the front to the rear room in the east structure of Chan's E-Group. A single calibrated radiocarbon sample on charcoal found in association with the incensario dates this event to AD 660–880 (2-sigma range). At the same time, a final ceramic cache (Cache 16), consisting of an incomplete Mt. Maloney bowl (figure 15.4f), was placed in the upper substructure of the northern building of the east E-Group structure. LeCount's research at Xunantunich (1996) has shown the importance of this ceramic type and form in feasting events and community identity, though it is not as commonly found in caches at Chan as it is at Xunantunich.

While the caching of ceramic vessels in architecture in Chan's E-Group ends in the late Late Classic, the focus of architectural activity and caching shifts to the north–south axis of the community center. No burials were identified from any time period in the north and south structures of the Central Group. Structure 6, the south range structure of Chan's Central Group, is the only full masonry vaulted building at the community (see Robin et al., ch. 7, this vol.). A series of three caches placed in steps, benches, and walls within the architecture of the south structure consists entirely of undecorated unslipped vessels: five stacked dishes (Cache 18, figure 15.4d), a set of lip-to-lip unslipped dishes (Cache 19, figure 15.4c), and one with four small unslipped bowls (Cache 20, figure 15.4e).

At the end of the late Late Classic, transitioning into the Terminal Classic, two deposits were encountered across two room floors of group C-003, the leading family residences located east of Chan's Central Group (Robin et al., ch. 7, this vol.). While it is unclear whether the material represents occupation debris or a termination event (Clayton et al. 2005), the material marks the termination of the use of this residential building. Both deposits had an unusually high concentration of sherds, a number of chert bifaces, a jade pendant, a *Strombus* pendant, hematite, a gneiss polishing tool, and a slate tool.

Terminal Classic Vieras Complex (AD 800/830–900)

No ceramic vessels were utilized in caches during the Terminal Classic. Instead, the final two caches placed in the south structure of Chan's Central

Group consist in one case of a sherd disk and an unidentified animal bone (Cache 21) and in the other of two chert bifaces (one broken and one complete) and deer antler fragments (Cache 22). A calibrated radiocarbon date from this cache dates to AD 770–980 (2-sigma range). A final caching event at the west structure of Chan's E-Group (Cache 23) also contained no ceramics. It is composed of two large, thin, chert laurel leaf bifaces (one broken and one complete) found in an east–west orientation along the central axis of the west E-Group structure. The bifaces were placed between the penultimate and ultimate fill of the final phase steps.

However, during the Terminal Classic, the major focus of activity appears to be a number of deposits left on the surfaces of floors and buildings of the E-Group and the south structure of the Central Group, effectively terminating the use of these structures and deconsecrating Chan's Central Group. A terminal deposit left on the centerline step of the west structure of the E-Group contains partial Belize Red vessels, Cayo Unslipped jars, and an incomplete Pedregal Modeled incensario. Similarly, a terminal deposit represents the final depositional event on the surface of the east structure of the E-Group. It consists of a number of mostly incomplete vessels and includes fragments of incensarios, Belize ashwares, and eroded polychromes. The high concentration of censer fragments and serving vessels in these two deposits on the E-Group is suggestive of a termination event (Freidel 1986; Garber 1986; Houk 2000), although there are no whole vessels. A single calibrated radiocarbon sample dates this event to AD 780–980 (2-sigma range).

A variety of problematical deposits were placed similarly in the south range structure, including a unique termination event consisting of 548 *jutes* covering a ceramic spindle whorl and a broken Roaring Creek Red pedestal base that had been reworked as a cord-holder in the hypothesized diviner's room (Robin et al., ch. 7, this vol.). Angela Keller's (ch. 13, this vol.) research suggests that the deposition of consumed jute was ritual in nature. Other final deposits in the south structure, terminating the use of the structure, included dense deposits of sherds, with some almost whole vessels, obsidian blade fragments (sourced to Ixtepeque and El Chayal), and faunal remains.

Many of these final deposits also contain a higher density of incensario or stove/brazier prongs than found elsewhere at the community. Of the 71 prongs uncovered in the community center excavations, 86 percent (n=61) are found in late Late Classic Pesoro and Terminal Classic Vieras contexts in the upper fills, terminal deposits, collapse, and humus levels of Chan's community center buildings, as well as in some levels that have evidence of Early Postclassic activity. Only 7 percent of the prongs were found in specialized contexts such as caches or burials, and the remaining ones are from architectural fills. There has been some recent discussion as to the exact function of these items (Ball and Taschek 2007) since their first identification in the archaeological record and museum collections. Thompson (1939) described them as chile mashers or pestles at the site of San Jose, while others suggested they were parts of incense burners (Merwin and Vaillant 1932). The assumption that these items—generally unslipped, solid prongs or horns with tapered or curved ends—were parts of composite ritual incense burners developed from the work of Stephan Borhegyi (1951a, 1951b, 1959), who compared the aforementioned archaeological examples with three-prong incensarios from Preclassic sites in the Guatemalan highlands.

However, in their contextual examination of prongs from Belize Valley sites, Ball and Taschek (2007) have shown that these prongs may have served more than one function, as supports for stoves or braziers for daily cooking and feasting events and secondarily as parts of incensarios. The prongs found in these later Chan contexts often co-occur with flanged censers and censer stands and are found in the upper levels of public buildings and higher-status residential structures in the community center. Given the strong evidence for communal feasting events at Belize Valley sites (LeCount 1996; Yaeger 2000a, 2000b) and the combined domestic and ritual activities associated with those events, it is likely that the prongs found in Chan's community center represent parts of multiple-function vessels: cooking stoves/braziers that may have been used for daily cooking and communal feasting events, as well as parts of incensarios used in termination events on community center structures.

The concept of the termination ritual deposit in the Maya lowlands (Freidel 1986; Garber 1986; Houk 2000) implies an event in which vessels were smashed and then scattered, along with other ritually meaningful items. The deposits on Chan's structures, rather than representing single termination events, may instead be the result of secondary deposition of material, possibly from feasting events, similar to deposits identified elsewhere (Clayton et al. 2005), given the high concentration of faunal remains and ceramics, including small and large serving bowls and incensario/stove prongs. These types of deposits terminating the use-life of structures may be ritual equivalents to dedication events (Freidel and Schele 1989) or convenient places to store trash in buildings undergoing the process of abandonment (Harrison 1999).

Early Postclassic (AD 900–1150/1200)

By AD 900, the population of Chan appears to have declined dramatically. In the Terminal Classic/Early Postclassic period, a low square structure was constructed in the Central Plaza, as a shrine, and oriented toward the intercardinal directions (Robin et al., ch. 6, this vol.). It was placed over the area of earliest offerings and associated with two mosaic altars of cut limestone on its eastern side (Blackmore 2003). A large cut stone fragment was located by the excavators on the shrine and fit with others located across the plaza to form a stone stela two meters high (chapter 6). The final ancient ritual event in Chan's Central Group appears to have been the placement of two caches, 24 and 25, consisting of shell, jade, and ceramics. Found just centimeters below the present ground surface, the caches contained an entire necklace of eleven heavy *Spondylus* beads and pendants, five jade beads, three incensario prongs, one almost complete unslipped and undecorated incensario as well as censer fragments, and two figurines (figure 15.4g). These final ritual events, like the first, occurred at the geographic center of the community almost 2,000 years after its initial occupation.

Discussion

The geographic center of the Chan community was established and dedicated as the focus of ritual behaviors at its very founding in the Middle Preclassic, and the knowledge and belief systems expressed in these activities was clearly the domain of farming households and communities (Robin 2003). Commoner ritual, lacking inscribed artifacts, nevertheless included both exotic and more-utilitarian items and served to memorialize place and provide a sense of community identity. Centrality was an important aspect of these activities, and the color green, represented by caching items made of jade and serpentine, figured prominently (Blackmore 2003; McAnany et al. 1999; Robin 2002a) in all caches in the Central Plaza. These items were esteemed by the Maya for their scarcity but also for their beauty and symbolism, representing concepts such as maize, centrality, and rulership (Taube 1998). Color symbolism may also have prompted the inclusion of shell items (white, yellow, and red), red-slipped sherds, and even obsidian (black). The inclusion of marine shells in caches and burials may be material representations of the watery underworld and the primordial sea, while objects of jade, serpentine, and obsidian represent objects of the earth (Freidel et al. 1993).

As mentioned previously, at the same time as these early caches, a single piece of jade was placed below the earliest floor of the north structure (Cache 6) of Chan's community center, the residence of Chan's leading family (see Robin et al., ch. 7, this vol.). This item is a very well finished piece with a slightly flattened teardrop shape in plan, which originally was made as part of a larger composite artifact, possibly the "nostril" of a mosaic mask (Keller 2008). Though it is the only piece of jade found in the entire construction sequence of the north structure, it may match the mosaic piece cached in the site center in Cache 2, marking and linking the ritual "center" of the site with the founding family's original place of residence (Keller 2008). An unworked chunk of serpentine was also found in the lowest level below one of the ancillary structures associated with north residence. The practice of dedication ceremonies including caching items under house floors is well documented in ethnographies of the modern Maya to this very day (Vogt 1976).

The pattern of ritual activities in the Middle Preclassic would seem to place a primary focus on both the location of the event and the colors of the included items, although ceramics were not a major part of this early ritual inventory at Chan. The single burial may have been a member of the founding family of Chan, establishing an ancestral link that persisted through time as well as cementing land tenure rights for the leading families (Lucero 2008, 2010; McAnany 1995, 1998). The presence of items exotic to the Belize Valley such as serpentine, jade, hematite, obsidian, and marine shells demonstrates that the residents of Chan engaged in long-distance trade and exchange by the Middle Preclassic.

Clearly, the inhabitants of Chan valued and interred a variety of ritual items when they placed their caches and buried their ancestors in the community's E-Group during the Late Preclassic. The use of shell ornaments has been identified as evidence for the establishment of personal identity based on age, gender, and status, as well as the construction of community identity (Keller, ch. 13, this vol.). Items made from shell, and shell-working detritus, were included as grave goods and in caches throughout Chan's occupation history and provide evidence of active community-centered production of shell ornaments beginning in the Middle Preclassic (Keller, ch. 13, this vol.). The ceramics included as grave goods came from everyday household inventories, exhibit use-wear, and may have been both valued possessions during the individual's lifetime and containers for foodstuffs that accompanied the deceased on her or his path into an afterlife. The selection of largely red-slipped vessels may have been intentional choices of the color red. The hypothesized use of Middle Preclassic figurines in burials to represent portraits of one's ancestors may be seen as precursors to depictions of ancestors on Classic period sculpture. Taken as a complete group within their archaeological context, these Preclassic burials and caches demonstrate that the complex ideology associated with ancestor veneration and symbolism had its roots in a popular religion in the homes of everyday Maya, long before its appearance among the Classic Maya elite (Robin et al., ch. 6, this vol.).

During the Classic period, while ceramics were no longer placed in burials in the early Late Classic, they were placed in caches, and the residents of Chan continued to utilize shell, jade, serpentine, and other exotics as grave goods, though in reduced quantities. The archaeological evidence suggests that by the late Late Classic and into the Terminal Classic, the focus of ritual may have shifted to community feasting events, the remains of which are represented in terminal occupation debris or so-called problematical deposits. Ritual performance was pervasive in everyday life and through both mortuary practices and feasting events helped to maintain social continuity (Gillespie 2001) for the inhabitants of Chan.

Conclusions

The examination of ancient Maya commoners only recently has received greater attention from archaeologists (Lohse and Valdez 2004b), although there is a long history of household studies in the Maya region (Wilk and Ashmore 1988). Nevertheless, even the more recent work has tended to focus heavily on the household, subsistence activities, settlement patterns, and status differences, with less attention directed to commoner behaviors associated with ritual and their expression in the material record. Prior studies (Gonlin and Lohse 2007; Mathews and Garber 2004; Robin 1999) have demonstrated that non-elites had access to ritual knowledge, which they expressed in caches, burials, and other deposits, and the evidence from Chan shows that both mundane and exotic items were placed during ritual events. Some of these items are found in both domestic and ceremonial spaces and in both public and private contexts, suggesting that the lines between secular and ritual behaviors and the material items utilized in those activities were indeed less rigid for ancient Maya commoner communities than has generally been categorized in archaeological interpretations (see Lucero 2008, 2010 for similar examples).

Our research at Chan documents a set of rich and diverse ritual practices that, rather than being static and unchanging, exhibited complex and careful planning in terms of the location of ritual events and the selection of material representations of the Maya worldview. This intersection of material goods used as ritual offerings with social practice represents a multilayered view of ancient Maya society that was clearly not the sole domain of Maya elites, and it had its beginnings in the Middle Preclassic long before its formalization by the elite of large Classic Maya centers. Through the public performance of ritual and shared activities of burial and ancestor worship, dedication and termination caching, and feasting, the material remains of which are often found by the archaeologist in so-called problematical deposits, the residents of Chan created a sacred landscape that linked them to the living, to their dead ancestors, and to the gods and was retained in their social memory for the entire 2,000-year occupation of the community.

5

Conclusion

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16

Learning from an Ancient Maya Farming Community

CYNTHIA ROBIN

Standing on top of El Castillo, the central temple at Xunantunich, and looking 4 km to the southeast, all one sees is a homogeneous mass of trees where the contemporary Belizean forest has reclaimed Chan. Just as the trees at Chan today appear homogeneous, the diversity and complexity of everyday life at Chan is obscured from an anthropological perspective taken from monumental centers looking out onto society. The Chan project aims to promote a change in perspective on Maya society by focusing on the diversity of life in a farming community and turning our archaeological perspective to that of a farming community looking out onto society.

From most locations at Chan, if one looks to the northwest, one can see a distant vista of El Castillo: royal pomp and circumstance reduced to a small, two-dimensional image in the background of the colorful and dynamic motion of everyday life at Chan. At least in the Late Classic period when El Castillo was constructed, this small and distant image of monumental construction, which was unlike anything at Chan, would have been a constant reminder to the people of Chan of the broader world in which they lived. It may also have reminded residents of the limits of their social world and the social differences that existed in their society. As Xunantunich's power waned in the Terminal Classic and the center was abandoned, this distant image may have symbolized something different: the failures of highly centralized and stratified states.

Chan's 2,000-year history is an instructive history, one that dissuades us of any lingering assumptions we might have about farmers and farming communities. Far from Western notions that the city, its leaders, and its institutions are the sole bastions of learning, innovation, and technological and spiritual advancement, Chan's farmers are instructive of the intellectual breadth and innovative nature of life in a farming community.

Most significant about the research at Chan is its ability to document the myriad ways in which life in a farming community impacted developments in Maya society. In this conclusion I draw together the various lines of evidence from the Chan research that demonstrate the active and innovative nature of its diverse residents and their impact on broader Maya society. I end this chapter by situating Chan within broader regional contexts in the Belize Valley and Maya world, followed by a discussion of the implications of this research for understanding complex societies.

Technology

As Andrew Wyatt's (ch. 4, this vol.) analyses of Chan's agricultural terraces indicate, agricultural production at Chan required a significant application of science. Constructing more than simple terrace walls, farmers at Chan increased and maintained high levels of agricultural production through the development of complex irrigation and water storage systems. The engineering of these systems required a detailed local knowledge of the natural environment acquired through long-term residency. For example, the manipulation of underground streams for the purpose of irrigation demonstrates an intimate knowledge of the local environment—a knowledge particularly important for farmers given the ecological diversity at Chan.

One of the most significant pieces of Wyatt's research is his finding, through the direct dating of fill contexts in terraces and of house structures constructed above terraces, that terrace agriculture began at Chan long before its population maximum and the florescence of Late Classic Xunantunich. Agricultural terraces, like the better-studied house mounds of the archaeological record, are built up through time. The earliest small and informal terraces at Chan, like its earliest houses, date to the Middle Preclassic period.

As Wyatt discusses, this evidence contradicts the anthropological models traditionally used to inform an understanding of the development of intensive agriculture. The work of economist Ester Boserup (1965) in *The Conditions of Agricultural Growth: The Economics of Agrarian Change under Population Pressure* furthers the idea that farmers will undertake labor-intensive agricultural techniques only under the duress of expanding populations. The work of historian Karl Wittfogel (1957) in *Oriental Despotism: A Comparative Study of Total Power* concludes that centralized bureaucratic control and technological knowledge is required for the construction of large-scale irrigation works for intensive agricultural systems. Applying these models to the Maya area has led to interpreting terrace agriculture as a response to Late Classic population maximums and the increasing tribute demands of Maya states. Instead, Wyatt shows that terrace agriculture at Chan was a local development by farmers to manage production in hilly terrain. Farmers' development of terrace agricultural systems avoided soil erosion and maximized water infiltration. This knowledge of sustainable agriculture established over the centuries and passed down generation after generation is one of the means through which Chan's residents sustained their community for 2,000 years.

Religion

Agriculture is not the only innovation of this farming community. In the area of religious practices, the 2,000-year history of Chan illustrates that complex ideational knowledge was initially developed in the homes and communities of farmers, dating back to the Middle Preclassic period. This "popular religion" was only later co-opted by society's ruling class and elevated to a "state religion." This contradicts notions of ideology and false consciousness articulated by Marx and Engels (1976 [1932]) in *The German Ideology* and later developed by Althusser (1971) and Gramsci (1971 [1845–49]), which postulate that ideological knowledge is created by dominant groups to support their position in society (Blackmore 2011; Lohse 2007). The Chan data demonstrates that religious knowledge not only was understood by the diverse inhabitants of the Maya world but also was part of the intellectual production of farmers that informed later state practices (also see Lucero 2010; McAnany 2004a; Walker and Lucero 2000).

Three central tenets of later Maya religious practices can be traced back to the Middle Preclassic practices of farmers at Chan: cardinal directional symbolism laying out a world cosmogram, sanctifying the centers of homes and communities, and ancestor veneration.

At Chan, venerating a select group of ancestors and reentering their graves to involve them in contemporary rituals and possibly decision making has a deep history going back to the Middle Preclassic (Novotny, ch. 12, this vol.). A critical part of ancestor veneration at Chan was direct access for the living to the bodies of the deceased. Establishing lines of communication with the ancestors was an important part of the political strategy of Classic Maya kings.

The ritual activities at the center of the community, from caches and burials to altars and stelae, all materially represent ideas about the meaning and importance of the cosmological center and its color and divinity associations (Blackmore, ch. 9; Cap, ch. 8; Kosakowsky et al., ch. 15; Robin et al., ch. 6; all in this vol.). Chan's architects planned and organized the Central Group around the cardinal directions to make visible statements about power and ideology (Robin et al., ch. 6, this vol.). The importance of cardinal directional symbolism was replicated from the largest scale of community construction to the small scale of individual caches (Keller, ch. 13, this vol.).

Ceremonies consecrating Chan as a community were the most dramatic of ritual events at Chan that brought all residents together (Cap, ch. 8, this vol.; Robin et al., ch. 7, this vol.). All of Chan's residents across its social spectrum performed rituals in their homes (Blackmore, ch. 9, this vol.; Robin 2002a; Wyatt, ch. 4, this vol.). From the humblest farmers to community leaders, Chan's residents were among the actors who, through their specific ritual practices, took part in creating what would become the highly conventionalized structures of ritual practices at later times.

Politics

Ritual and religion were not isolated from politics in Maya society. Chan's leaders governed the community through the orchestration of community-level ceremonies that brought all residents together (Cap, ch. 8, this vol.; Robin et al., ch. 6, this vol.) and through the hosting of large-scale feasts (Keller, ch. 13, this vol.), and on a day-to-day basis they presided over the administrative and adjudicative functions of the community (Robin et al., ch. 7, this vol.).

The leading families were not the only ones who hosted feasts at Chan. As Chelsea Blackmore's (ch. 9, this vol.) research at the Northeast Group shows, head families of neighborhoods across Chan also hosted feasts. Feasting was also identified at another of Chan's neighborhoods, Chan Nòohol, a newly settled area of the community in the late Late Classic (Robin 2002a). As Blackmore (ch. 9, this vol.) and Cap (ch. 8, this vol.) discuss, feasts were not only venues for integrating neighborhoods and communities but also places where head families—be those community leaders or heads of subgroups—could assert their authority in meaningful and visible ways. Modern Maya communities often hold community-wide ceremonies in a ceremonial round, where small-scale ceremonies are first held by head families of subgroups within the community and then all members of the community come together for a single community-wide event (Vogt 1976). The evidence of feasting at neighborhoods throughout Chan may indicate a similar sequence of feasting and ceremony prehistorically.

While feasting represents a type of sociopolitical activity that is associated with head families across Chan, other types of political activity took place only at Chan's Central Group. An *audiencia*-style administrative building located on the south edge of the Central Group contained a unique array of terminal deposits, which allowed the determination that a diviner's room was linked through a shared doorway to the central meeting room of Chan's leaders (Robin et al., ch. 7, this vol.). This joining of administrative and judiciary functions in the governance of the community is perhaps unsurprising, because in preindustrial societies administrative and judiciary functions tend not to be differentiated (Durkheim 1997 [1893]; Evans-Pritchard 1940; Inomata and Houston 2001).

The political strategies that Chan's leaders developed across its 2,000-year history were always a blend of what Blanton and colleagues (1996) refer to as individual-centered and group-oriented strategies. By the Classic period, political strategy at Chan was dominated by group-focused strategies, seen in a focus on the community rather than the individual in ritual practices, feasting, the more equitable distribution of goods across the community, and the absence of extreme social stratification (Keller, ch. 13, this vol.; Robin et al., ch. 7, this vol.). These are some of the social strategies that may have supported the longevity of the community.

Group-focused political strategies are distinct from the political strategies of Classic period kingship, which epitomize individual-centered strategy. Group-oriented political strategies are documented at the end of the Classic period associated with political fragmentation of systems of kingship (Fash 1993; Fash et al. 1992; Tate 1992) and in the Postclassic period (Braswell 2001; Ringle and Bey 2001). Such political strategies are generally seen as a breakdown in the Classic Maya system of kingship. But as Angela Keller discusses in chapter 13, the Classic period development of group-oriented political strategies at Chan indicates that there was a greater variety of forms of governance in the Classic period than systems of kingship. Group-focused political strategies of the Postclassic and colonial period may have owed as much to the development of such strategies on the part of Classic period farming communities as they did to the breakdown of the system of kingship. As McAnany (1995) discusses, even during the Classic period there were tensions between the more centralized and extractive forces of kingship and the long duration of kinship structures that disperse authority more broadly.

Economics

Chan was a diverse community, but this diversity was not organized in a hierarchical manner (Keller, ch. 13; Meierhoff et al., ch. 14; Robin et al., ch. 7; all in this vol.). Social stratification was not high at Chan; *heterarchy* is the term that best describes the organization of its diversity.

Farmers made up the majority of the community, but other community members engaged in the production of chert bifaces, limestone blocks, shell ornaments, and obsidian blades (Hearth, ch. 10; Keller, ch. 13; Kestle, ch. 11; Meierhoff et al., ch. 14; all in this vol.). Community-scale production of utilitarian chert bifaces and limestone blocks developed in the Late and Terminal Classic periods. The small-scale production of exotic shell ornaments and obsidian blades by Chan's leading families has a long history dating back to the Preclassic period.

Chan's economic organization is comparable to that seen at Cerén where Payson Sheets (2002) identifies three levels of economies: (1) the household economy, economic production for the household; (2) the village or horizontal economy, economic production for the community; and (3) the regional economy, economic production for exchange with regional centers (Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.).

In terms of the household economy, the majority of Chan's residents conducted a similar set of tasks on a day-to-day basis: they prepared and ate food, built and maintained perishable houses, procured the rough limestone rubble for the construction of their house platforms, and made expedient chert tools for their daily domestic uses; additionally, most of Chan's households produced the foodstuffs that they ate. Not only did these activities fuel the household economy, they were the basis for a set of common daily practices through which residents would have seen themselves as belonging to a household and community. These activities framed the space and time of life at Chan: the temporal rhythms of a day, the seasonal cycles of work, and the lived spaces of the land.

Community-level production of chert bifaces and the finely shaped limestone blocks that faced the exteriors of Chan's houses and other buildings developed in the Late and Terminal Classic period (Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.). As Caleb Kestle discusses, the late development of community-level production at Chan illustrates how residents drew upon their internal labor and production to promote their economic viability. But as much as the Late Classic was a period in which the Chan community turned inward, developing community-level production, it was also a time when the community turned outward to its greatest extent. Chan's leading families were turning outward and taking advantage of expanding regional networks to procure non-Guatemalan obsidian and finished marine shell ornaments, building upon their long-standing role in the procurement and small-scale production of these nonlocal items (Keller, ch. 13, this vol.; Meierhoff et al., ch. 14, this vol.). In terms of Late Classic developments in Chan's internal production and external trade relations, it is clear that residents variably used both open and closed strategies to buffer themselves and take advantage of expanding and contracting economic opportunities precipitated by the ebb and flow of broader political economies and the rising and falling of regional centers. The Chan community and its residents did not simply react to developments in the outside world; they strategically organized their internal production and external trade relations cognizant of the fact that broader regional economies fluctuated.

In terms of the regional economy from the inception of the community in the Middle Preclassic, Chan's residents were involved in the broad distribution networks through which exotic items such as serpentine, jade, hematite, obsidian, and marine shell circulated (Kosakowsky et al., ch. 15, this vol.). In terms of what they produced, agricultural products were the only items beyond labor itself exported from the Chan community (Wyatt, ch. 4, this vol.).

Change

There was nothing static about the Chan community. Farming practices changed and developed through time (Wyatt, ch. 4, this vol.), as did the use of the forest around Chan (Lentz et al., ch. 5, this vol.). As the community grew and population expanded into the Late Classic period, farmers cleared more of the forest for constructing homes and expanding agricultural lands, as can be seen by their increasing use of local hardwoods through time (Lentz et al., ch. 5, this vol.). But as Lentz and colleagues discuss, some type of long-term forest management practices on the part of Chan's inhabitants was in operation across Chan's history. From the Preclassic to the Terminal Classic period, only a limited number of hardwood types were being exploited. At the end of the Terminal Classic period in two ritual deposits that terminated the use of the east structure of the E-Group and the administrative structure in the Central Group, a large diversity of mature, closed-canopy tropical forest trees were identified that were not identified in any other deposits. That these trees existed in the final days of the Chan community suggests that residents carefully managed their forests, even during periods of population growth and the expansion of agricultural lands; otherwise, there would have been no tracts of forest after two millennia of forest product utilization by an expanding human population. This history of forest management at Chan is in contrast to that seen at Tikal, where around AD 741 residents seem to have run out of mature, closed-canopy tropical forest trees for their construction projects (Lentz and Hockady 2009).

Ritual practices changed as well at Chan. Ritual practices that initially focused on the veneration of individual ancestors developed into practices that foregrounded a notion of the community as a whole (Cap, ch. 8; Keller, ch. 13; Kosakowsky et al., ch. 15; Novotny, ch. 12; Robin et al., ch. 6; all in this vol.). Group-oriented political strategies developed across the Classic period (Keller, ch. 13, this vol.; Robin et al., ch. 7, this vol.). Economic production and consumption monitored changes in Maya society to allow community members to both take advantage of and buffer themselves against the vagaries of being part of the Maya world (Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.). From within Chan's 2,000-year history, we can see the community-internal mechanisms that fostered development and change at Chan, and we can trace how developments at Chan impacted later state systems. All throughout its history, Chan was part of a broader Maya world, as evidenced by the presence of nonlocal items and ceramic style indicators (Kosakowsky, ch. 3; Kosakowsky et al., ch. 15; Keller, ch. 13; Lentz et al., ch. 5; Meierhoff et al., ch. 14; all in this vol.). In the sections that follow, I discuss Chan in its broader regional and Maya context.

Chan in a Belize Valley Context

The Belize Valley can be divided into two regions. The upper Belize Valley, where Chan is located, is an upland area at the convergence of the Macal and Mopan branches of the Belize River (see figure 1.1). To the east lies the central Belize Valley, consisting of alluvial flatlands and neighboring hills along the Belize River (Chase and Garber 2004). The Belize Valley was initially occupied by sedentary communities using ceramics in the late Early Preclassic/early Middle Preclassic period (1000/800–650 BC) with the Cunil Ceramic Complex identified at Cahal Pech and Xunantunich and the Kanocha Ceramic Complex identified at Blackman Eddy (Garber et al. 2004; Healy et al. 2004; LeCount et al. 2002). Cunil ceramics were identified at Chan in later mixed deposits, but no primary occupation was identified (Kosakowsky, ch. 3, this vol.). While it is likely that some ephemeral activities were going on at Chan during this period, given the extensive nature of excavations that were undertaken to bedrock, it seems unlikely that a significant Cunil settlement existed. Chan does not appear to be among the earliest occupied communities in the Belize Valley.

By the later Middle Preclassic period (650–350 BC), there was extensive occupation of sites in the Belize Valley and across the Maya area (Chase and Garber 2004). The Middle Preclassic residents of some of the Belize Valley, as at the site of Buenavista, were living in isolated farmsteads (Ball and Taschek 2004). In other places, though, communities had developed around public and ceremonial architecture with attendant ritual deposits and feasting. Significant Middle Preclassic centers in the Belize Valley include Blackman Eddy, Cahal Pech, and Xunantunich's Group E (Awe 1992; Brown 2010; Brown et al. 2009; Garber et al. 2004).

The Middle Preclassic period is the first major period of occupation at Chan. By this time, Chan was a community (as opposed to a group of dispersed farmsteads) focused around the Central Group. Only residential architecture is found at Chan in the Middle Preclassic, with the highest structure rising to a height of 25 cm. Ritual and ancestor veneration were important aspects of community life, but they were conducted in plazas, not in specially constructed ritual architecture. At its founding, Chan was a small community relative to other Belize Valley communities. Middle Preclassic ceremonial architecture at Blackman Eddy stands 1.74 m in height (Garber et al. 2004) and that at Cahal Pech stands 2–3 m in height (Awe 1992). Smaller-scale Middle Preclassic architecture has also been identified at Nohoch Ek, where one structure rises to 45 cm (Brown et al. 2009; Coe and Coe 1956). As Kathryn Brown and colleagues (2009) point out, by the Middle Preclassic there was a well-established hierarchy of sites in the Belize Valley with sites like Chan and Nohoch Ek occupying the smaller end of that spectrum.

In the subsequent Late Preclassic and Terminal Preclassic periods, small and large centers in the Belize Valley continued to grow and expand (Ashmore 2010; Chase and Garber 2004). The first ceremonial architecture was constructed at Chan in the Late Preclassic, and its highest structure at this time rose to a height of 1.8 m. Relative to other communities, Chan remained a small site. At Blackman Eddy, the largest ceremonial architecture rose to a height of 3 m (Garber et al. 2004), both buildings of the twin pyramid complex at Xunantunich's Group E rose to a height of 7 m (Brown, personal communication), and at Cahal Pech multiple ceremonial buildings had been constructed, the highest rising to a height of 15 m (Awe 1992).

In the Terminal Preclassic period, Chan's ceremonial architecture was first transformed into an E-Group, an architectural complex associated with ritual and ancestor veneration, with its east structure reaching an elevation of 4.3 m. E-Groups have been identified across the Maya lowlands and were initially constructed between the Middle Preclassic and Terminal Preclassic period (Aimers and Rice 2006). Aimers and Rice identify 64 E-Groups in the Maya area (not including the Chan E-Group) at sites of various sizes. E-Groups have been identified at small and large Belize Valley centers and settlement areas at Actuncan, Arenal, Bedran, Baking Pot, Barton Ramie, Blackman Eddy, Cahal Pech, and Xunantunich (Aimers and Rice 2006; Conlon and Powis 2004). E-Groups were initially identified at large Maya centers such as Uaxactun's Group E. The identification of E-Groups at smaller centers and settlement areas in the Belize Valley such as Chan, Barton Ramie, and Bedran indicates that this type of ceremonial complex had its roots in the development of small as well as large sites.

Chan's ceremonial complex and settlement expanded in the Early Classic period, and the east structure of Chan's E-Group reached its maximum height of 5.6 m (Kosakowsky, ch. 3, this vol.; Robin et al., ch. 2, this vol.). This is significant because there is a general paucity of Early Classic ceramics reported at Belize Valley sites. This has led to a debate in the literature over whether the Early Classic was a period of depopulation in the Belize Valley or if researchers are not recognizing the ceramic assemblages of this time period. Rare, elite pottery types introduced from the central Petén region have primarily been used to identify the Early Classic (Awe 1992; Demarest 1992; Ford 1991; LeCount 2004a; Lincoln 1985). Recent work at the central precincts of Belize Valley centers such as Actuncan, Baking Pot, Buenavista, and Cahal Pech now suggests that the Early Classic was a dynamic period of architectural growth in the history of the Belize Valley (Awe and Helmke 2005; LeCount 2004a), although Belize Valley centers did not see uniform rates of architectural growth at this time (Brown et al. 2009). Chan's Early Classic settlement expansion illustrates that domestic assemblages from outside of the central Petén area are identifiable archaeologically. As archaeologists excavate more settlement areas, our understanding of the Early Classic in the Belize Valley will become clearer.

By the Late Classic period, a number of midsized civic centers were well established in the Belize Valley. Among these centers are Actuncan (LeCount 2004a), Baking Pot (Audet and Awe 2004), Blackman Eddy (Garber et al. 2004), Buenavista (Ball and Taschek 2001; Yaeger et al. 2009), Cahal Pech (Awe 1992), Camelote (Driver and Garber 2004), Guacamayo (Ashmore 2010; Neff et al. 1995), Las Ruinas (Ball and Taschek 1991), and Xunantunich (Leventhal and Ashmore 2004). These centers were organized as competitive peers. They jockeyed for power, but none became paramount.

Chan's interfluvial location between the Mopan and Macal rivers of the upper Belize Valley also situates the site at the interstices of the upper Belize Valley's civic centers (Actuncan, Buenavista, Cahal Pech, Guacamayo, Las Ruinas, and Xunantunich). Xunantunich is located 4 km to the west, Guacamayo is 4 km to the east, Las Ruinas is 5 km to the south, and Actuncan, Buenavista, and Cahal Pech are located to the north and northwest, with Cahal Pech being the most distant at 9 km away.

Xunantunich, Actuncan, and Buenavista are in unusually close proximity to one another. The significance of this close spacing may be understood by addressing the political histories of these civic centers, each representing a sequential seat of power (Ashmore 2010; LeCount and Yaeger 2010; Leventhal and Ashmore 2004). Actuncan's florescence was in the Early Classic, followed by Buenavista in the early Late Classic, and Xunantunich in the late Late Classic.

While Actuncan and Buenavista, like other civic centers in the Belize Valley, have long developmental histories, Xunantunich's hilltop center has a shorter but more dramatic developmental history. As LeCount and Yaeger summarize (2010), in the early Late Classic period Xunantunich was a relatively small hilltop center with less power than its political neighbors. In the early part of the late Late Classic period, there was dramatic and unprecedented civic and political expansion at Xunantunich, which became a powerful but subordinate polity incorporated into the Naranjo regional state. By the end of the Late Classic period, as Naranjo declined, Xunantunich became a fully autonomous polity capital with its own emblem glyph (Ashmore 2010; Ashmore and Sabloff 2002; Helmke et al. 2010; LeCount 2010; LeCount et al. 2002; Leventhal and Ashmore 2004). Xunantunich's rulers erected three carved stelae in the early part of the Terminal Classic period, but these royal statements were short lived, as only 150 years after its rapid expansion, Xunantunich was in decline (Helmke et al. 2010; Schortman 2010).

Rising to a height of 43 m in the late Late Classic period, Xunantunich's

El Castillo towered over the 24 m tall temples at neighboring centers of Buenavista and Cahal Pech. Constructed on a high ridgetop, like a panopticon, El Castillo could be seen far and wide. While LeCount and Yaeger (2010: 359) argue that the growth of Xunantunich transformed the political hierarchy of the Belize Valley, they also suggest that local populations with deep historical ties in the upper Belize Valley "must have presented a formidable front against top-down policies emanating from Xunantunich's provincial leaders."

Located 4 km to the southeast of Xunantunich, Chan was only a few hours' walk from the emerging polity capital. The late Late Classic period was the period of maximum architectural construction and settlement and agricultural expansion at Chan (chapter 2). Chan's settlement expansion during this period is dramatic: in the early Late Classic period, 37 percent of mound groups were occupied; and in the late Late Classic, 76 percent of mound groups were occupied. During this period, settlement was declining or leveling off in some areas around the neighboring center of Buenavista, which was losing power relative to Xunantunich (Ehret 1995; Yeager 2008). Some of Chan's newest residents in the late Late Classic period were likely the younger members of existing families, but others may have been newcomers arriving from not-so-distant areas adjacent to the faltering center of Buenavista, just a few kilometers away. These newcomers may not have been strangers to the Chan community but instead family and friends joining other family and friends in a nearby community. As they settled at Chan, they would have come into mutual intercourse with others of Chan's residents, both old and new, as they worked the land and developed agricultural systems that involved the labor of cooperating households (Wyatt, ch. 4, this vol.). I have used the term "voting with their feet," an analogy to Nancy Farriss's (1984: 76) discussions of Maya farmers who made choices and decisions to move in and out of the Spanish colonial world, to emphasize the active way that farmers' choices about where to move affected broader power relations in Maya society (Robin 1999; Robin et al. 2010). While some farmers seem to have been leaving areas around Buenavista for areas around Xunantunich, it is equally important that certain farmers were moving to Chan and other rural communities and not to the immediate vicinity of the Xunantunich center itself. As Yaeger (2003, 2010) notes, the Xunantunich center was not a big pull for population, a point I will return to later.

Across the Belize Valley, a range of red, black, multicolored, and unslipped ceramic vessels were available to residents. Lisa LeCount (1996,

Table 16.1. Major Late Classic ceramic wares and groups at Chan and Xunantunich

Context[a]	Uaxactun Unslipped Ware	Mt. Maloney Group	Dolphin Head Red Group	Belize Red Group	Chunhuitz Group	Other	Rim count
	%	%	%	%	%	%	*N*
Chan established residents (all contexts)	28.6	31.1	24.1	9.2	1.9	5.1	12,156
Chan established residents (occupation)	28.5	36.4	14	15	0	6.1	214
Chan new residents (occupation)	25.6	53.4	8.6	2.9	3.5	6	313
Xunantunich (occupation)	22.6	38.3	4.5	11.5	12.3	10.8	1,175

a. Frequencies are based on rim sherd counts. Given Chan's long temporal span, single-phase occupation deposits as identified at Xunantunich are not common at Chan. To facilitate comparison with the Xunantunich sample which comes solely from occupation contexts, data from Chan's single-phase occupation contexts are presented here. Note the comparability between frequencies from all contexts and single-phase occupation contexts at Chan.

2001, 2010) has identified that in the Late Classic, distinct ceramic style zones developed: one focused on the upper Belize Valley around Xunantunich, where Mt. Maloney Black vessels make up over 30 percent of ceramic assemblages; and one focused on the central Belize Valley, where black vessels make up only a small portion of ceramic assemblages and red vessels predominate. Because a range of red and black vessels were available to residents of the Belize Valley, LeCount suggests that the differential use of Mt. Maloney Black vessels represents a conscious signaling of people's sociopolitical affiliations. Significantly, at Xunantunich, Mt. Maloney Black vessels constitute a common vessel found in civic termination and dedication deposits (LeCount 2010; Jamison 2010: table 6.1). Table 16.1 illustrates that in the ceramic assemblages at Chan, Mt. Maloney Black vessels are found in proportions comparable to (in established households) or greater than (in newer households) those reported by LeCount at Xunantunich. Residents' choices in using Mt. Maloney vessels signaled their participation in a sociopolitical sphere that included Xunantunich.

As Laura Kosakowsky points out in chapter 3, there are also interesting differences between the Chan and Xunantunich ceramic assemblages. At Xunantunich, not only are higher frequencies of Mt. Maloney Black vessels being used, but also there are quite low frequencies of all of the primary Late Classic red vessels. The black coloration of ceramic assemblages at Xunantunich seen on a day-to-day basis would have been a quite visible statement of sociopolitical affiliation (LeCount 1996, 2001, 2010).

Although the percentage of Mt. Maloney vessels used by Chan's long-standing residents is comparable to that seen at Xunantunich, there are also higher percentages of red vessels, particularly Dolphin Head Red and Belize Red vessels, at Chan. Roughly equal numbers of red and black vessels were used at Chan (Kosakowsky, ch. 3, this vol.). Considering only slipped calcite wares, there are 8.5 times as many black vessels as red vessels at Xunantunich and only 2.6 times as many at Chan's established households. Mt. Maloney vessels were less frequently encountered in ritual deposits at Chan than in ritual deposits at Xunantunich (Kosakowsky et al., ch. 15, this vol.). At Chan, Dolphin Head Red, Belize Red, Roaring Creek Red, and Mt. Maloney ceramics were used in ritual deposits.

People always have multiple identities that they can variably draw upon in different social contexts (Meskell 2002; Schortman et al. 2001). Chan's residents were members of households, of Chan, of the Xunantunich polity, of the Belize Valley. They were members of even wider spheres of interaction, as their possession of Petén-style pottery and non-Guatemalan obsidian indicates (Kosakowsky, ch. 3, this vol.; Meierhoff et al., ch. 14, this vol.). They seem to have mobilized these identities in various ways. Their use of Mt. Maloney Black vessels signaled their participation in the upper Belize Valley and Xunantunich polity, but their concomitant use of red vessels signaled ties to other regional centers. By using red rather than black vessels in ritual and ceremonial contexts, they may have been saying something about where their alliances lay or about the different ways they chose to deploy their affiliations.

Chan's residents also expressed affiliations of being part of a broader (western and eastern) Belize Valley society through other media. Across Chan's 2,000-year history, the prone, extended, head to the south position is the dominant mode of interring the dead (Novotny, ch. 12, this vol.). This burial position was used throughout the western and eastern Belize Valley to express a shared valleywide identity and distinguish Belize Valley residents from residents in other parts of the Maya world (Healy 2004; Welsh 1988).

The households at Chan that were newly established in the late Late Classic period show a different pattern in their daily use of red and black pottery than that seen in long-established households. In newly established households, Mt. Maloney Black vessels make up an even higher proportion of ceramic assemblages than at Xunantunich, and the use of red vessels was low. This perhaps indicates some of the tensions that may have existed in Chan at this time, between its newest residents, who perhaps felt a greater allegiance to Xunantunich, and its long-term residents, who were more ambivalent about the promises of new sociopolitical relationships.

Most of Chan's newest residents in the late Late Classic period were farmers, but others were stone quarriers and chert biface producers (Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.). These residents lived in some of Chan's smallest type 1 and 2 households (mound groups are classified as type 1 to 7, with 1 being the smallest and 7 being the largest, as discussed in chapter 2). Although these residents lived in Chan's smallest households and may have accumulated less wealth in terms of luxury items, they were not "poor" (Blackmore, ch. 9; Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.; Robin 1999, 2002a, 2006; Wyatt, ch. 4, this vol.). Two of four extensively excavated type 2 households contained jade or serpentine, and one of seven extensively excavated type 1 households contained serpentine. Jade or serpentine is associated with all of the type 4, 5, 6, and 7 groups excavated at Chan. No jade or serpentine was found at the one type 3 group excavated.

In previous publications, I used the distribution of jade and serpentine at a smaller set of Chan's type 1 and 2 households to highlight the diversity that existed in even Chan's smallest farming households (Robin et al. 2010; Yaeger and Robin 2004). The distribution of jade and serpentine at the larger sample of type 1 and 2 households now excavated corroborates previously identified patterns. An important point can be drawn from this research: albeit small and few, jade and serpentine items are found at some of Chan's smallest households. Jade and serpentine are not found in farmers' homes of comparable size[1] in the nearby settlement areas of San Lorenzo and Chaa Creek (these settlement areas will be discussed in the next section). Shell ornaments are found in both small and large residences at Chan and San Lorenzo, but at San Lorenzo, higher-status residents possessed more elaborate shell items (Yaeger and Robin 2004), whereas at Chan, all residents had access to shell items of similar quality and Guatemalan obsidian items from similar sources (Keller, ch. 13, this vol.; Meierhoff et al., ch. 14, this vol.). The comparative evidence indicates that some of Chan's farmers living in small type 1 and 2 households were better off than other small-scale farmers recorded in the region.[2] While overall Chan's residents were at the bottom end of the social spectrum in Maya society, the goods that they had were more equitably distributed across the community. Osteological evidence from major centers across the Maya area indicates that health declined across the Classic period, but Novotny's (ch. 12, this vol.) osteological analysis from Chan suggests that levels of health remained comparable across the community's 2,000-year history. The consistent presence of a low degree of biological stress in the Chan skeletal population seems to indicate the persistent good health of the Chan community. Lentz and colleagues (ch. 5, this vol.) found a wide diversity of mature, closed-canopy tropical forest species and an absence of secondary growth species in the late Late Classic and Terminal Classic at Chan. Perhaps the higher density of settlement at Chan than at Xunantunich indicates that Chan had something to offer small-scale farmers in the way of a type of lifestyle that Xunantunich's rulers would not offer. At Chan, health was consistent, the forest was abundant, social stratification was less pronounced, and leaders practiced group-oriented political strategies.

The full ramification of these finds is even clearer if one considers the luxury items that have been identified at Xunantunich (Jamison 2010; LeCount 2010). As Jamison notes, in all of the caches identified at Xunantunich, only two contained a single jade or jadeite bead (2010: 138–39; table 6.1). Only three palace-school vases were identified at Xunantunich, suggesting that their rulers had a "tenuous place on the political landscape of the eastern Petén" (LeCount 2010). This brings up interesting questions about the relative wealth and relative poverty of Xunantunich's royalty and Chan's humblest farmers.

As Xunantunich declined in the Terminal Classic period and settlement across the Belize Valley contracted, as it did at Chan, it was Chan's newest farmers who "voted with their feet" and moved elsewhere, but this time they appear to have moved to distant areas. Chan's stone quarriers and chert biface producers, who were also among Chan's newest residents, had become enmeshed in community-level exchange networks within Chan. Along with Chan's more long-standing residents, these craftspeople were among those who chose to stay at Chan during the Terminal Classic period.

By the Postclassic period, Xunantunich had been abandoned. Only one community, Tipu, along the Macal River is known to have had substantial occupation in the upper Belize Valley at this time. Throughout most of the upper Belize Valley, scant populations of farmers were living in isolated farmsteads, as a few were living in the vicinity of what used to be the Chan community. Although Xunantunich had been a mighty power during the Late Classic, when these farmers chose a location to revere their ancestors they chose Chan, not the Late Classic hilltop center of Xunantunich (Robin et al., ch. 6, this vol.). Where they chose to revere their ancestors at Xunantunich was at Group E, which had been an important ritual center in the Preclassic (Brown 2010). As Kathryn Brown suggests, the choice of Xunantunich's Group E as the focus of Early Postclassic ritual at the Xunantunich center may have been a conscious rejection of the ideologies that Late Classic Xunantunich represented.

By the Early Postclassic period, farming communities and civic-centers alike in the upper Belize Valley were largely abandoned. The promise that the Belize Valley had held for centuries, of expanding farming populations and rising and declining civic-centers, was no longer what it used to be. The flexibility and adaptability of smallholding farmers had its limits. For 2,000 years, farming communities like Chan and civic centers like Actuncan, Buenavista, Cahal Pech, Guacamayo, Las Ruinas, and Xunantunich had become enmeshed in complex and overlapping relationships of influence and authority in something larger than their own history: the constitution of an upper Belize Valley society. The reason people left the upper Belize Valley does not appear to be environmental; certainly at Chan the mature forest still thrived (Lentz et al., ch. 5, this vol.). Changes were afoot in Maya society that were bigger than communities, large and small, in the upper Belize Valley, indeed, bigger than the upper Belize Valley itself. Traditional seats of power in the Petén had collapsed, and new seats of power were being established in other parts of the Maya world. People once again voted with their feet, this time largely leaving the upper Belize Valley.

Chan and Xunantunich: Issues and Debates

As any new research will complement, add to, and raise questions about research that came before it, there is one point of disagreement between the Chan research and the Xunantunich research presented in *Classic Maya Provincial Politics: Xunantunich and Its Hinterlands* (LeCount and Yaeger 2010). But disagreements can lead to the most fruitful discussions. The Chan research questions the applicability of Theodore Neff's (2010) model of population growth and intensive agriculture in the Xunantunich area. Neff develops a model based on population estimates generated from settlement survey data to explore how population growth and labor value affected the relationship between rulers and farmers. He concludes that by the late Late Classic period there was a drop in agricultural labor value in the Xunantunich area, leading to a situation in which rulers were able to exploit agricultural workers. LeCount and Yaeger (2010: 345) use Neff's study in their concluding discussion to illustrate that in the late Late Classic "the labor value of hinterland farmers was decreasing, leaving them in a weaker position to negotiate their places in the local and regional relationships of the polity's political economy." Edward Schortman (2010: 373), the discussant for the *Provincial Politics* volume, explores the unexplored social implications of the proposed model when he asks whether the newly established late Late Classic farmers in the Xunantunich vicinity were "landless and desperately in need of sustenance," hence more susceptible to exploitation by Xunantunich's rulers.

As Neff (2010: 264) states, his model "assumes the presence of an intensive hydraulic agricultural system, or a system equivalent to it." As defined by Wittfogel (1957) hydraulic agricultural systems have large-scale irrigation works created by centralized states whose leaders coerce laborers to work on these projects, leading to highly stratified societies.[3] Wyatt's (ch. 4, this vol.) archaeological data on Chan's terraces demonstrate that terrace agriculture at Chan was not a hydraulic agriculture system created by a centralized state but a system that developed accretionally through the work of cooperating farm families over generations. For the Belize Valley more broadly, Scott Fedick (1994) notes that terraces were constructed at the household level, not through a centrally controlled state program (also see Scarborough's [1998: 135] discussion of how even large-scale water management projects by Maya elites were not "anything similar to Wittfogel's 'total power'"). Neff's argument confuses intensive agriculture, which increases surplus potential with no necessary decrease in labor efficiency, as practiced at Chan and in the Belize Valley, with labor-intensive agriculture, in which production is increased with diminishing returns for labor investment, which has implications for centralized state control of labor (as defined by Erickson [2006: 337]).

Even if we assume that Wyatt's and Fedick's archaeological analyses are incorrect, Neff's model only works if the population estimates and labor value estimates he puts into the model are correct.[4] If populations were lower or ancient labor values higher than he estimates, his model would generate the opposite conclusion: that there was an increase in agricultural labor value in the late Late Classic, leading to a situation in which farmers had greater leverage with rulers.

While arguments could be made endlessly about the parameters of a model, the value of a model is in its application to archaeological data. As LeCount and Yaeger (2010: 354) note, one of the implications of Neff's model is that "state polities may have been more coercive in areas of highest density and, conversely more cajoling in parts of the valley that exhibited less explosive growth." Chan is the ideal place to test this hypothesis because it is located in the area where the highest mound densities have been identified in the Xunantunich region (Yeager 2010: table 11.1). If the model is correct, Chan's farmers would have been the most coerced and exploited of farmers in the Xunantunich vicinity. The data discussed above for life at Chan do not fit the model. As well, Chan's humblest type 1 and 2 farmers are comparably well off in the region.

A central part of Neff's (2010: 266) model is not just state exploitation of farmers but the means of that exploitation: as they accept gifts in the form of luxury items from Xunantunich's rulers, leaders of farming communities in turn collect tribute in the form of foodstuffs for Xunantunich's rulers from the farmers in their communities. Perhaps the paucity of luxury items at Xunantunich indicates that the rulers of Xunantunich had to give so much of their luxury items away to curry the favor of local leaders, they were unable to retain large quantities of those luxury items. The one class of luxury item identified at Chan that seems the most likely candidate to be a political gift from Xunantunich's rulers is non-Guatemalan obsidian. Four pieces of non-Guatemalan obsidian were found associated with the leading family residences at Chan that date to the late Late Classic period and Terminal Classic period (Meierhoff et al., ch. 14, this vol.). Because they do not occur in the lithic assemblages of Chan's leading families prior to the late Late Classic period and are from the most distant location of any items found at Chan, Meierhoff and colleagues suggest that these items might have been political gifts from the more regionally connected rulers at Xunantunich. But there are other explanations. As Meierhoff and colleagues discuss in chapter 14, Chan's leaders played a historical role in obsidian production and exchange at Chan and may have built on these historical ties to expand their regional networks in the late Late Classic period. One of the pieces of non-Guatemalan obsidian found at Chan is from the Pachuca source. Although the obsidian from the Xunantunich archaeological project collections has not been instrumentally sourced, Pachuca obsidian has a distinctive green coloration, allowing it to be visually sourced. The only Pachuca obsidian in the Xunantunich area comes from the Chaa

Creek (three pieces) and San Lorenzo (one piece) settlement areas; none was identified from Xunantunich (Kindon and Connell 1999). It does not seem that Xunantunich's rulers had any special claim on the distant trade networks that brought Pachuca obsidian into the Belize Valley. As Sheets (2002) notes, the existence of multiple major centers in a region—as was certainly the case in the vicinity of Chan—provided farmers with multiple potential means of affiliation with larger centers, which may have acted as a constraint on the power of any one center. Clearly Chan had established ties to other powerful places, such as those through which it accessed Pachuca obsidian. These relationships provided a constraint on Xunantunich's power.

Drawing upon the work of Eric Wolf (1955) discussed in the introduction, we may conclude that if farming community leaders were being drawn into a highly stratified system of kingship in which rulers coerced local leaders who coerced farmers, then we would expect to see high degrees of social stratification at Chan and growing distinction between leaders and the led. Wolf further posits that the organization of a farming community thus exploited would come to mirror that of the state and diverge from preexisting community orders. But the late Late Classic Chan community was not marked by high degrees of social stratification. A deep history of ancestor veneration was maintained, and heterarchy, not hierarchy, best exemplifies the sociopolitical organization of the community.

Unlike the major centers of Tikal or Copan, Xunantunich itself did not attract a large settlement (Yaeger 2010: table 11.1). Perhaps this settlement data along with the paucity of prestige goods found at Xunantunich and its short political history indicate that Xunantunich's rulers failed to collect sizable tribute from surrounding populations and thus were unable to amass great wealth, attract a large populace to their city, or assert their authority for a sustained period of time. Perhaps Chan's leaders and the farmers they represented had amassed a type of wealth that cannot be measured in terms of the quantity of luxury items and the size and elaboration of houses but should instead be measured through long-term personal ties to people and places: something that today we often capture with the expression "quality of life." This local "wealth" may have provided a formidable constraint on the policies of Xunantunich's rulers.

At the heart of this discussion is a question about how to model tribute. Could Xunantunich's rulers demand tribute, or were material goods and labor offered more voluntary? While Spanish colonial documents about the Postclassic period do not represent Classic period systems, in the *Relaciones Histórico-geográficas de la Gobernación de Yucatán* (de la Garza et al. 1983), Late Postclassic tribute arrangements vary considerably. "Historiographical concerns aside, sometimes tribute was small and almost voluntary, at tribute payers' volition and only what they wanted or managed to give" (Jeff Buechler, personal communication 2010; also see Foias 2002: 226–27).[5] Chan's local "wealth" may have enabled the community to set its own standards for tribute payment.

The archaeological data from Chan turn the model of exploited farmers on its head: the exploited farmers seem to have had quite a bit of wealth and power. Chan's residents developed a range of local production, manipulated local resources, and perhaps even played off competing Belize Valley powers. Because of this, Xunantunich was unable to dominate resources and production and thereby predetermine a network of dependency (also see Schortman and Urban 1992, 1994 for a comparable example of interactions between the less complex non-Maya peoples in the Naco Valley of Honduras and their more complex Maya neighbors). As this discussion illustrates and Erickson (2006: 353) notes, "peopling the past is a radical alternative to viewing farmers as faceless masses, the passive recipients of what the elite impose on them through direct coercion or state ideology."

From the perspective of Chan looking out onto Maya society, the powerful polity capital of Xunantunich appears to have been caught in a double bind of constraint. At the regional level, Xunantunich rose to power at the end of the Late Classic period, a period during which the system of divine kingship that its leaders had adopted was weakening and the powerful Petén polities of its patrons such as Naranjo were experiencing politically tumultuous times and declining. At the local level, Xunantunich was situated in a provincial part of the Maya world, one with a long history of interacting centers. None of the upper Belize Valley's major centers other than Xunantunich had 43 m high temples, had their own emblem glyph, or reached a level of regional power equal to that achieved by Xunantunich, but they had their own sources of local power. Even smaller communities such as Chan had developed resources and production and complex webs of sociopolitical and economic relations that constrained the development of a network of exploitation by Xunantunich.

Chan as an Example of a Type 3 Minor Center

Gordon Willey and William Bullard define three levels of settlement in the Maya area: major centers from which paramount rulers governed, minor centers with minor leaders, and house mounds (Bullard 1960; Willey et al. 1955, 1965). Within this typology, Chan falls into the smaller end of the minor centers.

Minor centers are smaller than major centers but have the same range of architectural components. They are types of communities, as these centers are often found surrounded by house mounds (Willey et al. 1955). Their complexity in conjunction with their small size initially suggested to scholars that they were a quite variable community type that served a wide variety of functions (Willey et al. 1955; also see Hammond 1975; Iannone and Connell 2003).

Minor centers are ubiquitous in the Maya area and Belize Valley yet remain underexplored relative to major centers (Hammond 1975; Iannone 2004; Iannone and Connell 2003). The recent publication *Perspectives on Ancient Maya Rural Complexity* (Iannone and Connell 2003) was the first attempt to synthesize what is known about minor centers across the Maya area.

Minor centers include the outlying groups of major centers, what Joyce Marcus (1983) refers to as the "multiple nuclei" of urban centers. Outlying groups of major centers may be directly connected to the central precinct of major centers via a causeway (these groups are also referred to a terminus groups; Chase and Chase 2003; Cheetham 2004), or their connection may be purely social and political rather than physical (Conlon and Moore 2003; Conlon and Powis 2004; Iannone 2003; Tourtellot et al. 2003). Minor centers may also include smaller communities in their own right that were situated between major centers (Brown et al. 2009; Coe and Coe 1956; Connell 2003; Driver and Garber 2004; Garber et al. 1993; Levi 2003; Taschek and Ball 2003). They also include the Preclassic precursors to larger Classic period centers (Hammond 1991; McAnany 2004a; McAnany et al. 2003).

The Xunantunich settlement survey directed by Wendy Ashmore, which explored settlement in the vicinity of Xunantunich, identified three minor centers: Chan, Callar Creek, and Dos Chombitos (Ashmore et al. 1994; Neff et al. 1995). Sam Connell (2000, 2003, 2010) identified two additional minor centers in the Chaa Creek area 6 km distant from Xunantunich. Jason Yaeger (2000a, 2000b, 2003) identified six hamlets containing between eight and twenty mound groups in the Rancho San Lorenzo area, located 1.5 km distant from Xunantunich. Full-scale horizontal excavations were conducted at the San Lorenzo hamlet by Yaeger, and test and trench excavations were conducted at the Chaa Creek minor centers by Connell.

The San Lorenzo hamlet was founded at the end of the Early Classic period and abandoned in the Terminal Classic period (Yaeger 2000a, 2000b, 2003). The hamlet consists of 20 mound groups, which span mound group types 1 to 6 in the Chan typology. San Lorenzo's residents farmed nearby rich alluvial soils. Chert nodules from Mopan river channel deposits provided a local resource for the production of informal tools. One of San Lorenzo's two largest residences (SL-22) was involved in marine shell production.

Although a much smaller settlement area, and as a hamlet not directly comparable to Chan with its 275 mound groups, San Lorenzo has a greater degree of variation and more elaboration in terms of its largest residences than at Chan. Like Chan's smallest residences, San Lorenzo's smallest residences were simple perishable constructions on low stone platforms, but larger residences had low stone foundation walls that supported higher perishable walls or had full stone walls, and at least one residence had a corbel vaulted roof. In terms of residential architecture, there was greater variability and more stratification at San Lorenzo. Heightened social stratification can also be seen in the distribution of luxury items, as greenstone was found only in two of San Lorenzo's larger patio groups, where residences either had stone walls and thatch roofs or stone walls and corbel vaulted roofs. Between the San Lorenzo hamlet and its neighboring hamlet to the west, Yaeger identified SL-13, a unique construction with two patios, that he suggests was likely built by Xunantunich's rulers, indicating their direct role in affairs at San Lorenzo.

Although more distant from Xunantunich than either Chan or San Lorenzo, Chaa Creek–area residents could see El Castillo in the distance (Connell 2000, 2003, 2010). The Chaa Creek minor centers, CC1 (Stela Group) and CC18 (Tunchilen Group), are type 7 mound groups comparable to but somewhat smaller than Chan's Central Group. CC1 has 5 m and 3 m high temples and CC18 has 5.5 m and 3 m high temples. Like Chan, both CC1 and CC18 have long occupation histories going back to the Preclassic period, but unlike Chan, both of the Chaa Creek centers seem to have fallen into disuse in the late Late Classic period. Adjacent to CC1, Connell identified a secondary elite residential area (CC5, Plantain Group) with an L-shaped corbel vaulted masonry residence. CC5 was occupied in the early and late Late Classic periods and witnessed large-scale renovation, reorientation of architecture toward Xunantunich, and locally unprecedented wealth at the end of the Late Classic, which Connell suggests is indicative of new and strong ties to Xunantunich's rulers. A terminal deposit at CC5 contained greenstone beads, polychrome vessels, chert and obsidian eccentrics, shell pendants, and high-quality tools and ground stone. Connell suggest that secondary elites in the Chaa Creek area abandoned their ancestral ceremonial precincts in favor of local opulent residential architecture and material goods.

Comparing Chan, San Lorenzo, and the Chaa Creek minor centers, we see three different ways in which communities in the Xunantunich area related to Xunantunich's rulers. At San Lorenzo, Xunantunich's rulers played a direct role in orchestrating community affairs. Secondary elite at Chaa Creek's CC5 abandoned traditional practices in favor of greater cooperation with Xunantunich's rulers, leading to high degrees of wealth and social stratification in their communities. In the short term, the cooperation of the San Lorenzo and Chaa Creek leaders was rewarded and made manifest in large corbel vaulted homes, and the Chaa Creek leaders had levels of material wealth that were not identified at Chan. But in the long term, as Eric Wolf would have cautioned, the strategies of affiliation that they chose resulted in heightened social stratification within their communities and ultimately did not lead to long-term community success. Chan's leaders, in contrast, chose measured constraint in terms of the relationships they built with Xunantunich's rulers and the paramounts of other nearby major centers. While the end of the Late Classic period was a time when Chan's leaders' external affiliations expanded, it was also a time when the community's internal productive capabilities were also most widely developed, allowing residents to maintain their economic viability in the face of economic fluctuations.

James Garber and colleagues define a useful model for categorizing the variability in the different types of minor centers (Driver and Garber 2004; Garber et al. 1993). They use distance to major center to define type 1, type 2, and type 3 minor centers: type 1 minor centers are located within 2 km of a major center, type 2 minor centers are located beyond 2 km from a major center but still are in the general proximity of a major center, and type 3 minor centers are located equidistant between two major centers. In this model, Chan is a type 3 minor center.

Driver and Garber (2004) compare four type 3 minor centers in the Belize Valley where limited excavations have been conducted: Floral Park, located between Baking Pot and Blackman Eddy; Esperanza, located between Baking Pot and Cahal Pech; Nohoch Ek, located between Xunantunich and Cahal Pech; and Ontario, located between Blackman Eddy and Camelote

(Brown et al. 2009; Coe and Coe 1956; Glassman et al. 1995; Kirke 1980; Tasheck and Ball 2003; Willey et al. 1965).

Floral Park's site center consists of two conical structures rising 6.5 and 5.4 m in height and two residential groups. Esperanza's site center consists of one heavily looted pyramidal structure and a plaza surrounded by low linear mounds. Nohoch Ek's site center consists of six range structures arranged around a plaza and two smaller adjacent courtyard groups. Ontario's site center consists of two plazas, one of which contains a 5.5 m high pyramidal structure (Driver and Garber 2004: 293–302).

Both Floral Park and Nohoch Ek have lengthy occupation histories dating back to the Preclassic period, whereas Esperanza and Ontario date solely to the Late Classic period. The earliest Middle Preclassic architecture at Nohoch Ek measures 45 cm in height, comparable to that at Chan. No formal studies of the settlement around the centers of Floral Park, Esperanza, and Nohoch Ek were conducted, but researchers note dense concentrations of house mounds in the areas surrounding these centers. Irrigation systems around Floral Park and agricultural terraces around Nohoch Ek indicate that intensive agriculture was undertaken in these areas (Kirke 1980; Tasheck and Ball 2003). Conversely, Ontario appears to be an isolated center, as a settlement survey transect extending 200 m north and 150 m south of its central architectural group identified only four additional structures. Comparing the material culture of Floral Park to that of Baking Pot and Blackman Eddy, Driver and Garber conclude that the leading family of the Floral Park community was not part of "the elite system of either Baking Pot or Blackman Eddy" (2004: 293). In 1956, Coe and Coe speculated that construction on the scale seen at Nohoch Ek could not have been undertaken without direct managerial authority from a major center such as Xunantunich or Cahal Pech. More recent excavations by Joseph Ball and Jennifer Taschek in 1985 suggest that the architecture at Nohoch Ek was well within the means of its leading families and that its construction was not administered by rulers from neighboring major centers. As Coe and Coe compared the scale of the structures at the center of Nohoch Ek with those of the unexcavated house mounds in the surrounding area, they speculated that "while class stratification existed, it may not have been quite so severe as in some dominant center like Uaxactun" (1956: 381).

There is clear variability in type 3 minor centers, but a comparison of Nohoch Ek, Floral Park, and Chan suggests that some type 3 minor centers were farming communities with deep histories and local leaders who developed heterarchical political strategies and fostered long-term community survival. As a type of ancient Maya farming community, Chan has parallels with some type 3 minor centers and differences from others. Much more work needs to be done before we can understand the range and variability in type 3 minor centers. To understand them as the centers of communities, we must first survey and excavate the surrounding residential areas that made these minor centers community centers.

The best-documented prehistoric farming community is the Cerén site excavated by Payson Sheets (1992, 2000, 2002), which is located 350 km to the south of Chan in El Salvador. Comparable to Chan, Cerén is situated 5 km from the nearest civic-center, San Andres. To date, 70 buildings have been identified at Cerén, but the full extent of its settlement is not known.

A UNESCO World Heritage Site, Cerén was buried under the ash of a volcanic eruption around AD 590. The organic remains of perishable buildings and foodstuffs in fields and homes were preserved at Cerén, leading many to consider it a unique site. From Cerén we have an intimate glimpse into daily life in a farming community: the crops are still standing in the fields, peoples' finger swipes are visible on dirty dishes, the occasional mouse or ant had found its way into a storage vessel, and other unique findings. The details of everyday life at Cerén were quite surprising, because although its farmers lived in simple perishable structures with thatch roofs, Sheets (2002) identifies that their lives were quite rich. Beautiful polychrome vessels and chocolate (thought to be a royal drink) were all found in farmers' humble homes (Sheets 1992). Workshops and work areas surrounded houses, demonstrating a wide range of craft specialization that operated beyond the reach of the ruling elite class: every household produced some item in excess of what it needed to participate in community-level exchanges (Sheets 2000).

As significant as Cerén's unique preservation is, the reason why we have all of these details about everyday life is because of the excavation methods employed by Sheets (2002), methods that can be employed at sites of regular preservation. Sheets conducted full-scale horizontal excavations, not just on buildings but also in fields, gardens, and the areas around buildings (extramural spaces where substantial amounts of daily life occur).

This type of horizontal excavation and attention to intra- and extramural spaces was undertaken at Chan. Instead of putting a trench through a terrace to identify its construction history, Wyatt (ch. 4, this vol.) exposed whole terrace agricultural systems, identifying the details of irrigation and water storage. He even documented intimate aspects of daily life, such as how farmers used organic household waste to fertilize their fields.

Excavations in plazas (Cap, ch. 8, this vol.) and in extramural space around houses (Blackmore, ch. 9, this vol.; Hearth, ch. 10, this vol.; Kestle, ch. 11, this vol.; Robin 2002a) indicate that these seemingly empty spaces were vibrant locations of daily work, ritual, and political activity. Finding a chert biface workshop within a house-lot at Chan is consistent with the placement of workshops near houses at Cerén. Kestle (ch. 11, this vol.) explored two households that were similarly situated adjacent to agricultural terraces and limestone quarries and were composed of architecturally comparable houses, but because he explored extramural spaces he was able to identify which household was more involved in agricultural activities and which was more involved in quarrying activities. The details of community-level specialization at Chan would not have been identified without horizontal exposures of extramural spaces. The excavation of extramural spaces provides significant information about the organization of society; without such investigations, our understandings of the social, economic, religious, and political organization of a complex society are limited (Robin and Rothschild 2002).

Although organic remains were not preserved at Chan and the preservation of carbonized remains is quite poor, taking 10 liter soil samples for flotation from every excavation lot allowed David Lentz and colleagues (ch. 5, this vol.) to identify a diverse range of forest species at Chan. Soil chemical testing of plaster floors revealed usage patterns specific to domestic, ritual, and administrative uses of space (Robin et al., ch. 7, this vol.). Microartifact analyses revealed the traces of practices that sweepers had missed with their brooms (Cap, ch. 8, this vol.).

There are numerous similarities between Chan and Cerén: the organization of house-lots, the diversity of plant life, the richness of farmers' lives. The parallels between Chan's divination room and Cerén's divination building are striking: both were unusual spaces with tripartite room divisions that had numerous interior walls, steps, and changing floor elevations that made physical movement challenging. Deer skulls and piles of divinatory items were the paraphernalia of the diviners who worked in these spaces. From the perspective of farmers at Chan, the farmers at Cerén do not look so unique anymore.

Cerén's farmers farmed volcanic soils, arguably some of the richest agricultural lands. Chan's hilly terrain and Vaca suite Cuxu subsuite soils are considered marginal under modern mechanized agricultural regimes (King et al. 1992). But Chan's farmers were not constrained by the same limitations that constrain modern farmers (Robin 1999, 2002a). The wealth of Chan's and Cerén's farmers appears to have been generated not by the environmental conditions they inherited but by the communities they created.

Farmers in Complex Societies

There are few who see the traditional peasant model as anything other than part of the intellectual history of our field. But as Raymond Williams (1975) notes, a whole host of assumptions about cities and countrysides are so deeply ingrained in Western literature, art, and society that certain images and associations seem to persist, even as we attempt to eschew them. Within the field of archaeology, Clark Erickson (2006) illustrates how persistent assumptions about farmers still are in research cross-culturally. In models of complex societies, land and labor are what constitute farming communities. Without the agricultural produce and labor of rural communities, elites could not exist. Rural producers are critical to the development of complex societies because they produce the agricultural surpluses that allow for the development and promotion of the quintessential human achievement—states and their constituent cities. Benefiting from the surpluses produced in farming communities, cities and their residents are able to innovate societies' achievements: high culture, science, arts, religion, and so forth.

Land and labor are equivalent to farming communities: How could such a simple idea be so right and so profoundly wrong at the same time? The land and labor that made Chan a community were as central to the hearts and minds of residents as they were economic commodities. But equating farming communities with land and labor misses the host of ideas, technologies, political strategies, nonagricultural economies, and so forth that developed at Chan. What an impoverished view of farming communities and human societies this is.

Characterizing farming communities as land and labor equates them with other types of resources that states and their rulers attempt to control. Models of complex societies have focused on debates between whether states are centralized or decentralized. In decentralized state models, the autonomy and self-sufficiency of farming communities is a corollary of the weakly integrated state that does not wield the concentrated power needed to coerce and control its hinterlands. In centralized state models, the dependence and hierarchical integration of farming communities within the larger polity is a corollary for strong political authority and hegemony over its hinterlands. Rather than seeing these as two types of complexity that characterize a society, researchers now view these as two ends of a spectrum of complexity that can exist in any society (Fox et al. 1996; Iannone 2002; LeCount and Yeager 2010; Marcus 1998). These two positions and points on the continuum between them do paint farming communities in contrasting ways, but they always paint farming communities as passive objects of state strategies (Robin et al. 2010). And there lies the Trojan horse of the traditional peasant model: assumptions about passive peasants underlie models that we draw upon in our research.

This volume advocates an approach to archaeological theory, model building, data collection, and analysis that sees theoretical and empirical research as dependent upon one another. Theoretical insights must be complemented by a deep commitment to furthering empirical studies. In the advancement of knowledge, there is a constant interplay between theoretical issues that develop from empirical studies and empirical problems that relate to theoretical arguments.

As we have explored Chan across its 2,000-year history, we have uncovered a socially, intellectually, and technologically vibrant community. Farmers innovated agricultural technologies, ritual practices, and political strategies that were both critical in the development of their community and became integral parts of pre-Columbian Maya society. Forest maintenance, terracing to avoid erosion and maximize water infiltration, knowledge of sustainable agriculture established over centuries and passed down generation after generation, and the use of local resources are some of the environmentally effective strategies developed by Chan's farmers that enabled the establishment of a long-lived community. Avoidance of extremes of wealth and power, avoidance of exclusionary ritual and political practices, feasting, community-wide ceremonies, and reasonably equitable distributions of exotic items are some of the socially effective strategies established by Chan's farmers that facilitated the long development of the community. Major centers in the Belize Valley, like the political capital of Xunantunich and others, may have been impressive in their time but had rising and falling political histories. At Tikal, arguably one of the largest and most opulent Maya civic-centers, with the most inequitable distribution of wealth, poor health and deforestation mark the end of the Classic period. When we compare Chan's longevity and its social and environmental strategies with much more opulent centers, their monumental temple-pyramids and palaces, we gain new insight into the relationship between cities and farming communities and perhaps see the ways in which we may learn some of our most important lessons about human societies from a smaller community like Chan.

We hope this volume provides a sense of what it was like to live in one Maya farming community over its long, 2,000-year history. We also hope that through the details of this farming community's life we have promoted a change in the ways that archaeologists will model the roles and relations of farmers in complex societies in the future.

Notes

I would like to thank Jeff Buechler, PhD candidate in anthropology at the University of Illinois, Chicago, for providing me with the references on voluntary tribute quoted in this chapter and in footnote 5.

1. The Chaa Creek settlement was classified using the same mound group types (1 to 7) as used at Chan (Connell 2000). A different mound group typology was used at San Lorenzo, but Yaeger's type IIA mound group corresponds to type 1 mound groups at Chan, and his type IIB mound groups correspond to type 2 mound groups at Chan (Yaeger 2000a: table 4.3).

2. In a previous article, David Lentz, Jason Yaeger, Cynthia Robin, and Wendy Ashmore (2005) argued that pine was less ubiquitous in some of Chan's smallest farming households than in both larger and comparably sized households at San Lorenzo or ceremonial spaces at Xunantunich. Current data from recent excavations at Chan contradict the earlier results. The original Chan sample analyzed in the 2005 article contained 92 late Late Classic paleoethnobotanical samples, only 3 of which contained pine. This contrasts with findings from Xunantunich, where 24 of 101 Late and Terminal Classic paleoethnobotanical samples contained pine, and from San Lorenzo, where 24 of 128 Late and Terminal Classic paleoethnobotanical samples contained pine (Lentz et al. 2005: table 1). David Lentz has analyzed 295 Late and Terminal Classic paleoethnobotanical samples from Chan, of which 73 contain pine, comparable to what was documented at Xunantunich and San Lorenzo. Pine has been identified at recently excavated small (type 1 and 2) households at Chan (farming households, limestone quarrying households, and a chert biface–producing household), suggesting that there was intercommunity variability in pine acquisition within this status level at Chan. As well, Wyatt's (ch. 4, this vol.; 2008b) research on agricultural terraces indicates that pine was a component of organic refuse deposition on terraces. Terrace bed contexts were underrepresented in the Chan households that were used in the original study; thus, if terrace contexts had been explored in those households, they too may have shown greater access to pine, as identified in the currently excavated sample.

3. Drawing on the work of Karl Marx, Wittfogel (1957) believed that there were two modes of production: an Asiatic mode of production developed around large-scale irrigation works, which required centralized management and forced labor and resulted in the highly centralized and despotic Oriental states; and the contrasting Western mode of production in which authority was traditionally decentralized, leading to the development of

industrial capitalism. The Asiatic mode of production was not characteristic of all Oriental societies, nor was it exclusive to Oriental societies. Wittfogel lists ancient Egypt, Mesopotamia, India, China, the Aztec Empire, and the Inca Empire among hydraulic civilizations. He theorized that ancient civilizations developed through the use of managerial control and forced labor in large-scale irrigation projects, which required an organizational hierarchy and governmental control. Wittfogel was also aware that despotic societies could develop in the absence of large-scale irrigation projects because he considered Russia to be an example of a despotic society, and Russian agriculture is not hydraulic. To resolve this issue, he created different types of despotic societies. Marginal type hydraulic societies develop in the geographical periphery of a hydraulic zone through the diffusion of despotic strategies. Wittfogel considered the ancient Maya a marginal type hydraulic society. Shortly after its publication, *Oriental Despotism* came under heavy critique. Robert McCormick Adams (1966) in *The Evolution of Urban Society: Early Mesopotamia and Prehispanic Mexico* used archaeological data from ancient civilizations to illustrate that large-scale irrigation was not a primary cause of political coercion.

4. As Neff notes, and is discussed in chapter 2, Mayanists use various methods to derive population estimates from settlement survey data. The number of people who live in a structure, the percentage of structures that are residential, the percentage of structures that are inhabited contemporaneously, and the time span of a given phase of occupation all have to be estimated. Neff estimates that five people lived in a structure. He estimates that all identified structures were residential and that all structures were inhabited contemporaneously.

Estimating ancient labor values is even more challenging than estimating ancient populations. Neff derived his labor values from the work of Elliot Abrams (1995), who in turn derived his labor values from the work of Ester Boserup (1965). The data that Abrams (1995: 201) used to derive ancient labor values are "hypothetical but consistent and realistic for general illustrative purposes, derived in part from estimates offered by Sanders (1973: 342), which also are hypothetical but realistic." He continues by saying, "I would have preferred to use empirically based marginal-productivity data, but I have found it very difficult to obtain such data for contemporary agricultural systems in Latin America, despite their clear importance in decision making." Robert McC. Netting (1993) in *Smallholders, Householders: Farm Families and the Ecology of Intensive Sustainable Agriculture* addresses questions of labor value, particularly the problems with Boserup's work on this topic. As Netting notes (1993: 105), Boserup's ideas about the work and value of intensive agriculture versus extensive swidden agriculture, which form the basis of Abrams's model, appear "logical and compelling" but are in fact not based on any actual studies of the time, labor, and value involved in agricultural work, as Abrams himself points out. Netting (1993: 102–22) shows through detailed cross-cultural ethnographic studies that there is a complex relationship between the inputs and outputs in intensive agricultural systems that relates to a wide range of variables, including but not limited to the nature of the intensification, family size, farm size, soil quality, climatic conditions, types of crops grown, divisions of labor, types of markets for crops, and so forth. There are conditions under which populations become too high for it to be possible for farmers to continue to add value to their land and labor through intensification. One such documented situation is among the Owerre-Ebeire of Nigeria, where there is a population density of 1,200 people per square kilometer. All other differences between the contemporary Owerre-Ebeire and the ancient Belize Valley farmers aside, Owerre-Ebeire populations are over two times as high as Neff estimates for the Xunantunich hinterlands. Netting also points out that farm families do not just farm, and they can enhance the value of their labor through the production of nonagricultural goods for both household use and extrahousehold markets. As the farmers at Chan were involved in nonagricultural production at the household and community level, this adds another dimension to the value of their labor.

5. Three different cases of relatively voluntary tribute are recounted in the *Relaciones Histórico-geográficas de la Gobernación de Yucatán* (de la Garza et al. 1983):

> [Tutul Xiu] . . . tuvo a todos de los señores de la tierra debajo de su dominio más por maña que por fuerza de armas, y dicen de él que fue muy sabio, que enseño las letras y la cuenta de los meses y anos a los naturales . . . Los tributos que llevaban sus vasallos eran de maíz, gallinas, miel y alguna ropilla de algodón, todo muy limitado y casi voluntario, que no era más que un reconocimiento de su señorío, salvo que eran los vasallos obligados a servir en la guerra con sus personas. (*Relación de Dzan, Panabchen, y Muna,* 252–53; *Relación de Mama y Kantemo*, 110; *Relación de Tabi y Chunhuhub*, 164)

> . . . el mayor señor de la dicha provincia, a quien todos eran sujetos . . . al cual cada año le tributaban sus vasallos de su voluntad, sin ser forzados a ello, lo que su posible alcanzaba y el propio tributario le quería dar, lo cual le daban de maíz . . . la cantidad que el súbdito quería . . . (*Relación de Muxuppipp*, 376–77)

> En tiempo de su gentilidad no tenían más señor que al cacique y éste los gobernaba y aun los tiranizaba; y no le tributaban mas que maíz, frijoles ya ají, y unos patiejos o mantillas de poco más que una vara." (*Relación de Cacalchen, Yaxa, y Sihunchen*, 342)

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