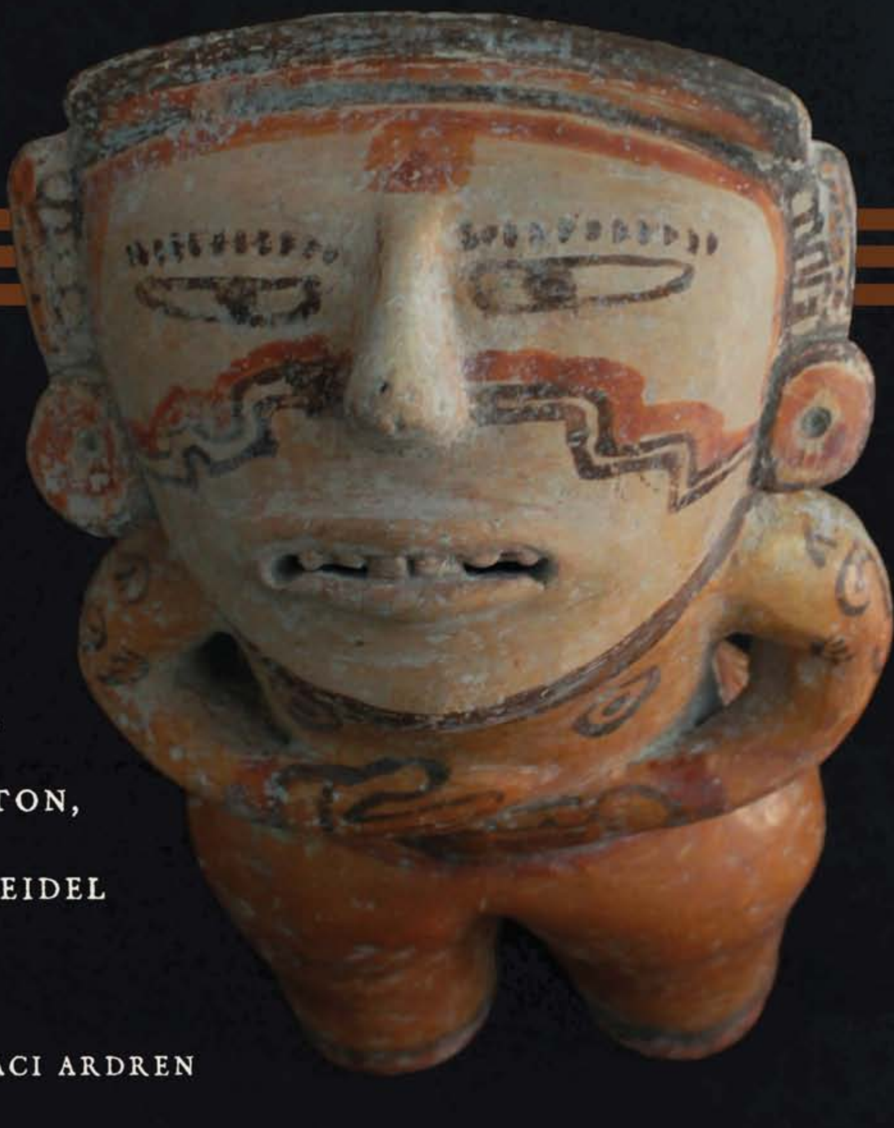
BEFORE KUKULKÁN

BIOARCHAEOLOGY OF MAYA LIFE, DEATH, AND IDENTITY AT CLASSIC PERIOD YAXUNÁ



VERA TIESLER,
ANDREA CUCINA,
TRAVIS W. STANTON,
AND DAVID A. FREIDEL

FOREWORD BY TRACI ARDREN

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*To Michael D. Coe (*1929)*
and
Arturo Romano Pacheco (1921–2015),

both of whom have been admirable inspirations for
bridging the fields in pre-Columbian research.

CONTENTS

FOREWORD

TRACI ARDREN

YAXUNÁ IS AN extraordinary place. This may sound like hyperbole or simple exaggeration, but the volume you hold in your hands will convince you that the ancient Maya city of Yaxuná is a place like no other.

All archaeological sites are venues for contemplating the arbitrary boundary between past and present. When does the past become past? How is the present ever separated from what came before? In thinking and learning about Yaxuná, familiar terms such as "ancient" or "memory" take on profoundly new depths of meaning, enlivened by the realities of a place that Maya people have called home for more than three millennia. What is ancient about Yaxuná, its early settlement and precocious adoption of royal insignia, carries forward for thousands of years and informs the present-day life of people who live and visit this site. There is no way to keep what is ancient about Yaxuná in the past or in any way divisible from the present (and future). What is memory to someone who lives on a landscape where humans have eaten the same food and climbed the same pyramids for millennia? How are memories of one's own research sifted from the memories of earlier researchers, their stories, and theories? Boundaries are blurry in a place where scholars have been compelled to ask questions and seek answers for over a hundred years.

Perhaps the boundaries of past and present are blurry at Yaxuná because by its nature, it is situated in both the past and present. It is neither a relic of the past, long forgotten and ready to be rediscovered, nor is it a fully formed creation of the present, free to speak in any language or on any topic. It is a place rooted in Maya culture and history, a place that breathes Maya culture and history into life every day, and a place that will be at the forefront of what the world comes to know about Maya culture and history well past the twenty-first century. It defies boundaries and reminds us how our modern notions of time and meaning are so very arbitrary and ephemeral. The capacity of this settlement to defy definitions is due in part to its location at a crossroads—a place where cultures meet, where people crossed paths in the past as they do today, where ideas were bartered and change was always in the air.

Researchers have long searched for an obvious explanation for the location of this settlement and its subsequent longevity. There are few observable clues—no river crossing or huge cenote, no rare and strategically important natural resource that would have provided economic security. Rather, like many ancient Maya cities, the founders of Yaxuná and those who continued to renew and reinvent the city for the next three thousand years followed an intangible call to mediate social interactions. Almost equidistant from the eastern and western coasts of the peninsula, halfway from the northern coast to the central lowlands, the history of Yaxuná was, is, and always will be dictated by its ability to draw together the people and ideas from other regions, to use the strength of the crossroads location to reinvent itself when the fortunes of one tradition failed or a new cultural movement arose. We see this demonstrated in the earliest occupation of the site, when key markers of Maya cultural identity from the southern lowlands, such as the astronomical temple known as an E-Group, are built for the first time in the northern lowlands. Later, as described in detail in this volume, the leaders of Yaxuná drew on royal insignia of the Petén region, as well as local elite traditions to generate a statement about the Early Classic royal dynasty of Yaxuná in the provisioning of the royal tomb known as Burial 23. During the Late Classic period, Puuc architectural styles jockeyed with the political maneuvers of an ambitious queen from Cobá, who built the longest Maya *sacbé* from her city to Yaxuná, in one of the clearest materializations of Yaxuná's role as a cultural crossroads. Even following conquest by Chichén Itzá, people from the west returned to Yaxuná to build Late Postclassic shrines as memory of the past was reinvented for thirteenth- and fourteenth-century political needs. During the Colonial period Yaxuná was both far from the European influences of Mérida and Valladolid, and was brought within Colonial-era agricultural enterprises. The Caste War (1847–1901) saw refugees take shelter at Yaxuná as they fled east, away from the violence centered in the western part of the peninsula. Today Yaxuná remains at the crossroads—the modern village and adjacent archaeological site are just south of the highway that bisects the peninsula and equidistant from the state capital Mérida and the touristic capital of Cancún. Young people from the village are drawn out of Yaxunáh to work in both Mérida and Cancún and bring the economic resources and cultural influences of those two very different cities back to their home in the center of the peninsula.

Scholarly investigation of the archaeological site of Yaxuná began almost one hundred years ago. While intermittent, it is reasonable to argue that Yaxuná is one of the best-documented and best-published Classic Maya sites. With the addition of this volume, such an assertion takes on even greater strength. The authors have written an exciting and comprehensive study of the cultural aspects of death, and life, at ancient Yaxuná. Bioarchaeological studies allow us to know the unwritten histories of ancient people, especially the people who were not the subject of Classic hieroglyphic inscriptions or art. In this volume you will learn a great deal about the royalty of Yaxuná, especially the foreign-born Sun King who died around AD 400 and was buried in a tomb full of entheogenic paraphernalia, as well as the royal woman who carried a Moon Goddess figurine when she was ritually sacrificed just over one century later. Death touches us all, and the bioarchaeological analyses presented here speak as powerfully about children, commoners, and the forgotten as they do about the elite. This forces us to think about power and inequality in novel ways, freed from the usual strictures of a tiny royalty and an immense supporting population. The discussions in this book allow us to see the many places where difference and congruence existed in the past, often far from the palaces and tombs of kings and queens.

Thus this volume is different from most books about the ancient Maya. It is the result of a unique and powerful collaboration between four accomplished specialists in ancient Maya culture, each bringing to the table their own detailed bioarchaeological, iconographic, archaeological, and ultimately anthropological investigations in order to jointly tell the very human story of a long-lived and complex Maya kingdom. Archaeology is always best when it is a collaborative science, but this type of publication is a rare effort and likely unique in the northern Maya lowlands. It integrates everyone from the past into the narrative of ancient life and death. It is a book to inspire our imagination about ancient cultures and yet one deeply grounded in the scientific analysis of material evidence. There is nothing comparable to this volume in the field of Maya studies, and I invite you to enjoy the exploration of the rich stories and reconstructions that are possible only at a remarkable place like Yaxuná.

PREFACE AND ACKNOWLEDGMENTS

THIS BOOK FOCUSES on a uniquely human side of our past—a past represented here by the ancient Maya of Yaxuná, in the heart of the northern lowlands of Yucatán, Mexico, and their neighbors throughout the region. The pre-Columbian inhabitants of what are now the archaeological ruins of an important Maya city lived in a world of daily activities and customs, which we can find reflected in their mortuary practices and which also partly left their marks in their skeletal remains. During their lifetimes, they experienced trauma and illness, and they cumulatively witnessed the challenges, transitions, and crises of nearly two millennia of occupation stretching back to the dawn of Maya civilization to the Classic period collapse in the ninth century AD. It was our combined academic curiosity concerning just how these pre-Columbian people lived and died, not in abstract terms, but in the real human dimensions of everyday life, that triggered our initial conversations about the Yaxuná material. Our interest in the remains of Yaxuná's ancient inhabitants was also fueled by our frustration with the conventional disciplinary divides of comprehending the past, which in practice has led to either less-than-rigorous interpretations of the forensic clues registered on bones or to analyses of final resting places that overly rely on the artifactual materials and architectural contexts. Sadly, the scrutiny of humans as such and of the experienced past registered in their remains has not been a focus of sufficient systematic research in the area of the world where we work, although this is now changing. A phenomenon as elusive as it is complex, the study of human experience etched into the people themselves, of human life and death, awaits deeper explorations in pre-Columbian Mesoamerica, and this volume is a step in that direction. We hope it is as exciting and intriguing a foray for our readers as it has proven to be for us.

Human remains at Yaxuná first came into focus during the late 1980s and 1990s when the Selz Foundation Yaxuná Project, directed by David Freidel, recruited Sharon Bennett to be project bioarchaeologist. Sharon had worked previously on human remains from the site of Cerro Maya, focus of Freidel's research in the 1970s, and became an enthusiastic member of the field staff of the Selz Foundation project. She set up her lab in the main communal building of the project in the nearby Maya village of Yaxunáh and subsequently studied the remains in the Mérida laboratory of the project. Sadly, Sharon passed away before she could complete her analyses, but her findings are incorporated into the monograph on the first Yaxuná project (Stanton et al. 2010).

Sharon was responsible and dedicated. Her principal assistant was a *comisario* of the village of Yaxunáh, and he and his companions were rightly proud of their efforts to document ancestral people of the ancient city together with the professional anthropologist, just like the people of Yaxunáh in general, who remain proud of their work at the archaeological site. Despite all her enthusiasm and rigor, Sharon's training and skills were limited compared to what bioarchaeologists now have at hand, given the recent impressive advances in the study of ancient human remains. Sharon's work was therefore unfinished, as it left many areas to explore, an open chapter to be filled in and updated. We knew that what we had originally published would be provisional. We now know just how much more we can know about these ancestral Maya.

In 2005, Travis Stanton (a member of the original project staff) helped renew international collaborative work at Yaxuná. The Proyecto de Interacción Política del Centro de Yucatán (PIPCY) took form in 2007, then directed by Travis Stanton, Aline Magnoni, and Scott Hutson. Focused on questions regarding chronology, the relationship of Chichén Itzá with its hinterland, and the origins of Maya civilization, PIPCY was a survey project and did not have the recovery of human remains as a part of its original research agenda. However, the completion of the analysis of the burials recovered by the Selz Project and how they could inform the ongoing research at Yaxuná remained a goal and led to the initial contact between PIPCY and the Universidad Autónoma de Yucatán (UADY) Bioarchaeology Laboratory in 2010 (Tiesler et al. 2012, 2014). Coincidentally, at the time of these initial conversations, human skeletal remains began to appear during the PIPCY excavations in 2011, and at this time formal field collaborations were established to document and analyze the human remains through collaborative work. This joint fieldwork triggered rich discussions of the archaeology of the Maya and of the role of human remains in creating culturally aligned and scientifically sound narratives of the ancient Maya.

In this vein we soon recognized that the potential of this collaboration went beyond just human bones. We saw that the human remains, with their details discerned, were unique starting points that sustained broader discussions concerning culture change in Maya society, traditions embodied by the living and the dead, life crises, and collective contingencies. André Leroi-Gourhan's *chaîne opératoire* (operational chain) could be applied to the treatment of people themselves. While a trove of meanings and culturally sanctioned practices surfaced, with their complex and varied expressions in the mortuary record, we began to see patterns and the potential for our dialogues to have a substantial impact on larger discussions of the Maya past. At this point, all four authors started to talk about a full volume that would situate the Yaxuná materials in a regional perspective, a volume that would be anchored in the mortuary record—the physical remnants of the people of the past so to speak—but within the context of local and regional archaeological data, epigraphy, and iconography, combining cutting edge methodology on dietary and migratory reconstruction with the best that bioarcheology and funerary archaeology has to offer. Truth be told, bioarchaeology is relatively recent in the Maya area. While epigraphers and art historians have been crafting the "human side" of Maya narratives for quite some time, although from a male-dominated elite faction perspective, we felt that bioarchaeological work had progressed enough to enter these broader humanizing discussions from a point of view that would give us insights from commoners, children, and women as well.

In our "human" approach, the lifeways of the ancient Maya (the domain of bioarchaeology) are just as central to us as their deathways. The latter embrace both burial practices and human sacrifice and are reconstructed here through the scrutiny of a recently developed discipline known by the term "archaeoethanatology" in the Anglophone academic community (Duday 2009). This is a uniquely French approach to conducting an "archeology of human skeletons" and comes with a philosophy. In the chapters of this volume we embed archaeothanatology within broader schemes of interpretative transdisciplinary burial reconstruction. Indeed, we believe that this way of conducting mortuary research offers a compelling contribution to all archaeological decompositional processes and therefore receives special attention in our efforts. Two of the authors have received training by the distinguished bioanthropologist Henri Duday from the University of Bordeaux who, together with his work group, has established an *anthropologie du terrain* (field anthropology), known for more undertakings that include the excavation of human remains.

What is archaeothanatology exactly about? As a supplement to most conventional field approaches, archaeothanatology does not rely so much on recording standards, a priori taxonomies, patterning, complex statistics, or—more recently—cognitive narratives, but rather advocates an almost intuitive, essentially inductive integrative approach that respects all empirical data equally, but ultimately proposes a synthesis that foregrounds the body. General knowledge of behavioral patterns and funerary traditions is conceived to accrue out of an accumulation of carefully crafted, detailed case studies in human taphonomy. The latter usually recognize decompositional patterns and sequences of single anatomic segments and discuss their individual and joint interactions with the extrinsic environment. Archaeothanatological work ideally begins with active in situ documentation of corpse and skeletal arrangements, a heuristic tool for active comprehension, designed to lead a discovery trajectory serendipitously to the integral recognition of the individual taphonomic processes operating in each case, and from here to the often protracted funerary pathways of individual burials or the growth of ossuaries during decades and centuries.

Applied to the local mortuary record of Yaxuná, the operational dimension of conducting archaeothanatology, concretely the active process of reconstructing mortuary behavior stepwise from the material record, allowed us to reconstruct those operational chains that led to the formation of the mortuary contexts, through which we reformulated the original interpretations by the Selz Foundation on death cycling and residential continuity, on the funerary pomps of the privileged, and the ritual slaughter of sacrificial victims and dynasties to be replaced. By contextualizing the funerary record within the multiple dimension of the time, at macrolevel (i.e., the Classic period) we could reconstruct the biocultural evolutionary pattern of a population from the onset of Yaxuná as a kingdom ruled by a foreign king to its final abandonment under the political and military pressure of the rising power of Chichén Itzá. Under the microlevel lens (i.e., the timing and sequencing of depositions within a multiple burial), instead, we eventually understood the line of processes that led to the violent extermination of a dynasty, as witnessed by the ritual depositional sequence, mode, distribution, and organization of the richly attired dead bodies of a king, his spouse, and their companions at the end of the Early Classic period.

It was clear from the start of our publication project that this endeavor, despite its single-site perspective, was by no means limited to the human remains from the ancient Maya center of Yaxuná. Instead, the site documentation was to be contextualized and enriched with information gleaned from all over the Maya lowlands. To this end, we compared the local bioarchaeological and mortuary signatures with those from thousands of skeletal remains, collected during more than two decades from across the area. In doing so, we did not neglect to underscore that Yaxuná was a unique center, which was distinctive from its urban Maya peers in many ways. For example, Yaxuná adopted Petén-style architecture already from the Middle Formative when most other northern lowland centers still used regional architectural conventions. This "foreignness" is attributable to the location of Yaxuná along an early inland trade route from the salt flats just to the north of the city to the southern Petén kingdoms, which was first proposed by David Freidel in the 1980s. For the same reason, Yaxuná in all likelihood consumed much larger quantities of foreign trade goods than its regional peers, a trend that continued in fact up to the Late Classic.

Revisiting the Selz Foundation materials from a culturally ingrained bioarchaeological (and really interdisciplinary) perspective and working under the framework of archaeothanatology, the outline of the present volume finally began to take shape during the sabbatical year of Vera Tiesler and Andrea Cucina. The academic year was financed by the CONACyT and UC MEXUS Scholar Exchange Program and hosted by Travis Stanton and Karl Taube at the University of California at Riverside. Working together on a daily basis, it became obvious to us then that while there has been an increasing number of superb journal articles and volumes of Maya bioarchaeology following the interdisciplinary path, a manuscript of the undertaking contemplated by us had not been attempted yet. We believed that contextualizing a copious series of human burials (from two distinct archaeological projects) from a single Maya city with sixteen field seasons worth of settlement survey, excavation in both public and domestic areas, and extensive artifact analysis definitely deserved a publication.

Many people contributed to making this project a reality. First and foremost we wish to thank the community of Yaxunáh for allowing us to conduct research on their community lands and having access to the human remains. Bernard Selz and the Selz Foundation of New York supported the original Yaxuná project beginning in 1989 and following renaming of the project as the Selz Foundation Yaxuná Project in 1992 continued substantially supporting the project through the completion of that research program in 1997. Mr. Selz has continued his generous support of archaeologists of the first Yaxuná project, making a significant contribution to the science and ancient history of the Maya of Yucatán. The first Yaxuná project also received support from the National Geographic Society in 1986, 1987, and 1990 through the good offices of George Stuart and from the National Endowment for the Humanities in 1988 and 1991. This project also received funding from a group of philanthropists in Dallas, Texas, through a nonprofit foundation originally organized by T. Tim Cullum. The Dallas group was convened and inspired by Stanley Marcus, long-term mentor to David Freidel during his years at Southern Methodist University. These Dallas friends have supported David Freidel's fieldwork and scholarship throughout his career. Finally, Jerome E. Glick began his support of David Freidel's work with the Yaxuná project, and that support has continued ever since. Distinguished professional colleagues in northern lowland archaeology, Edward Kurjack, Anthony P. Andrews, and Tomás Gallereta Negrón originally took David Freidel to Yaxuná and introduced him to the site and the community. Their collegiality and support ensured the successful launching of the first Yaxuná project. Fernando Robles Castellanos supported and participated in the Yaxuná research in ways critical to the discoveries and analyses presented in this book.

The PIPCY project owes a great debt to the Consejo de Arqueología of the Instituto Nacional de Antropología e Historia for granting the permits to conduct this research, in particular Nelly Robles, Pedro Francisco Sánchez Nava, and María de los Ángeles Olay Barrientos, as well as all of our colleagues in the Mérida regional center, including Lourdes Toscano Hernández, José Osorio León, and Francisco Pérez, who have offered invaluable insight as *responsables* of the archaeological sites in the Municipio de Yaxcabá. Project co-directors over the years, Aline Magnoni, Traci Ardren, and Scott Hutson, deserve special thanks for getting this project off the ground and nurturing the research to the state it is in today. We thank the many students from the Universidad de las Américas Puebla who worked in a number of capacities on the project over the years, especially Tanya Cariño Ayala, Vania Carrillo Bosch, Luis Hernández, Thania Ibarra, Antonio Lorenzini, Nelda Marengo Camacho, Ariel Texis Muñoz, César Torres Ochoa, and Maria Teresa Vázquez Sánchez, who through excavations, documentation, analysis, and report writing contributed directly to the understanding of the human remains at Yaxuná. Sabrina Simon, Karla Castro, and Jonathan Pagliaro also deserve appreciation for participating in these excavations.

Thanks also go to the staff and students from the Laboratory of Bioarchaeology and Histology, Universidad Autónoma de Yucatán who, since 2010, have effortlessly helped in the fieldwork and lab analyses. In particular, we are grateful to Julio Roberto Chi Keb, whose organizational help was essential to carry out the extensive analyses in and around the facility of Bioarchaeology. Thanks go to Saúl Chay Vela, Raúl López Pérez, Joana Cetina Batún, Kadwin Pérez López, Amalia Herrera, and Alfonso Argueta, who have actively participated in the recovery, cleaning, inventory, and tracings of the human remains from the site. We received further support by artists and professional illustrators, specifically the artistic input by Mirna Sánchez, Belem Ceballos, and Érika Meijide Jansen, whom we thankfully acknowledged along these lines.

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Negroe Sierra, Allan Ortega Muñoz, Tom Patterson, Patricia Plunket, Marco Ramírez, Sharon Shanahan, and Karl Taube. This book has also been enhanced greatly by the valuable expertise and fertile exchange with a number of colleagues and research teams from different countries and continents, with whom we share a host of more specific publications on Yaxuná's inhabitants. The C-N stable isotope analysis was performed by Stan Ambrose, the Sr-O stable isotope analysis was performed by Doug Price, and the radiocarbon dating of the bone material was performed at the AMS laboratory at the University of Arizona. Our thankful appreciation goes also to María Luisa Vázquez de Ágredos of the University of Valencia, to Anne Stone and María Nieves Colon of Arizona State University, and to Patricia Quintana Owen of the National Polytechnical Institute CINVESTAV in Mérida.

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Last but not least, we are indebted to the fine staff of the University of Arizona Press—and specifically senior editor Allyson Carter and editorial, design, and production manager Amanda Krause—and copy editor Brian Black for supporting us all the way in the publication process. The publication of this volume was also made possible thanks to the financial support generously granted by the University of California, Riverside, and by Dr. Celia Rosado Avilés, director of the Facultad de Ciencias Antropológicas, Universidad Autónoma de Yucatán. The comments of at least three anonymous reviewers have aided us substantially to improve the scope and voice of this combined work; a heartfelt thank you for making available your time and expertise. All errors remain our own responsibility.

BEFORE KUKULKÁN

INTRODUCTION

The Bioarchaeology of Yaxuná

THE CLASSIC PERIOD (AD 250–900) represents the peak era of cultural and social evolution of Maya civilization prior to the well-known collapse of many of the large central lowland city-states (Demarest et al. 2004; Webster 2002). While the political, economic, and social meltdown took its toll among the central Maya kingdoms deep in Petén and along the Usumacinta River, their northern Maya neighbors rose to political and economic power, soon to be dominated by the metropolis of Chichén Itzá (Andrews et al. 2003; Cobos 2003; Ringle et al. 1998). In this volume, we wish to illuminate human lifeways in the northern Maya lowlands prior to the rise of Chichén Itzá by using the direct testimony of the human skeletal remains of those who played an active role in the history and evolution of Classic Maya society (figure I.1). Specifically, this volume focuses on the center of Yaxuná, located some 18 km south of Chichén Itzá and the largest city in its immediate vicinity. An ancient city whose occupation stretches back well into the first millennium BC, Yaxuná was the capital in the area before the rise of Chichén Itzá and coexisted with it before this northern rival rose to regional domination toward the end of the tumultuous Classic period. Yaxuná would experience its own tragic end as a strategic power when the Itzá capital sent forces to conquer and subdue it. Chichén Itzá became the last urban metropolis of the Classic period lowlands. But this is a different trajectory, and Yaxuná and its people, represented in part through their remains, are worth knowing in their own right.

There is no doubt that the Classic period region of the northern lowlands has been poorly understood on its own terms, obscured by scholarly focus on the central lowland Maya kingdoms to the south and the rise of the Itzá merchant leagues (Demarest 2004; Houston and Inomata 2009). Here in the north a comparative lack of epigraphic and iconographic data has historically limited the cohesive regional sociopolitical coverage that characterizes the southern Maya neighbors (e.g., Martin and Grube 1995, 2000; Schele and Freidel 1990; Schele and Mathews 1998). This situation has led to a marginalization in treatment of the northern lowland cities prior to the development of the famous late urban phenomena of

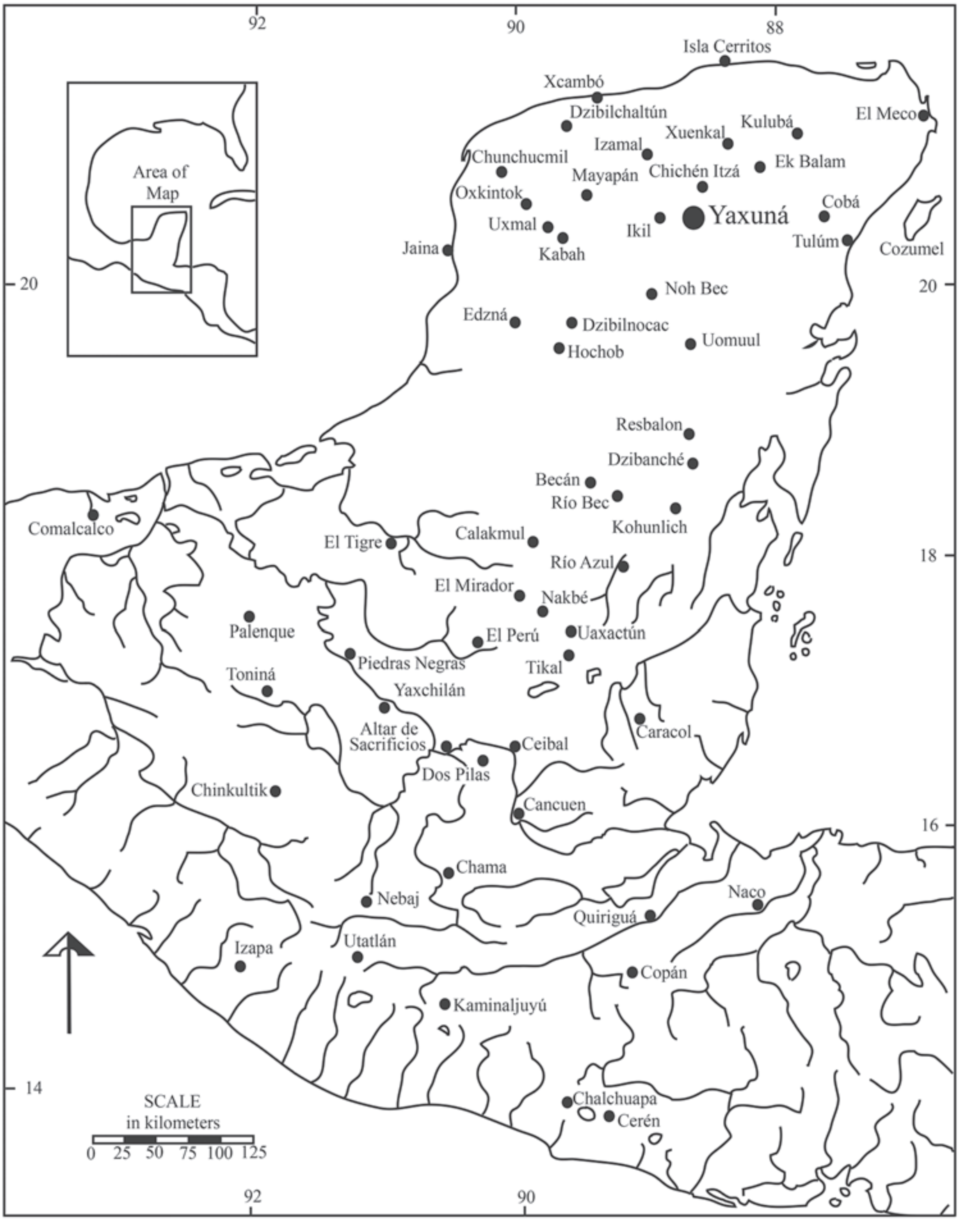


FIGURE I.1. Map of the Maya area.

Chichén Itzá and Mayapán in archaeological narratives of the Maya lowlands. This omission is most notable in the case of Izamal, which by the Early Classic was arguably half the size of Tikal when this southern city was at its maximum occupation during the Late Classic (Hutson 2012). Yaxuná itself stands up in monumentality against its famous urban neighbor; its largest pyramid measures nearly three times the size of the famous Castillo at Chichén Itzá by volume and was in use at least half a millennium longer than Chichén Itzá's iconic central monument. It is time to think again about the north.

To provide a fresh look at the complexity of Classic period life in the north we have chosen a particular approach that we believe will facilitate a complementary and in many ways more nuanced vision of life and death, an immediacy of experience, before the advent of the Itzá trader leagues. As scientists, our point of departure is the final arrival point of individual people in the ground. Their mortal remains provide a testimony of their prior journeys through life, in a site-specific perspective of a single settlement located at an important and contested cultural interstice of the Yucatán Peninsula: the Classic Maya capital of Yaxuná (Stanton et al. 2010). Our site-focused exploration is held up by extensive interdisciplinary research, which has been conducted by four projects over the past 30 years (e.g., Brainerd 1958; Kidder 1932, 1935; Stanton and Magnoni 2013; Stanton et al. 2010; Toscano Hernandez and Ortegón 2003). Using burial contexts and the remnants of their human occupants from two of these projects as the analytical focus, we explore the evolving roles and collective identities of Yaxuná's Classic period people. We examine and discern locals and foreigners who were eventually interred at the site, representing nearly a millennium of life and death at this central Yucatecan city. In short, we attempt to wield the human lens of history. This lens elucidates human experiences inscribed on the body, lived on a day-to-day basis, some of them surrounding the time of death. Beyond death, bodies turn into corpses, person-keepers that anchored to surviving kin the transition of the deceased to the status of ancestors.

Yet we do not study the Yaxuná data in isolation. Rather, we place them into regional context through the use of the human skeletal database compiled throughout the years by the Laboratory of Bioarchaeology and Histology at the Universidad Autónoma de Yucatán (Autonomous University of Yucatán, UADY), as well as published data and interpretations from like-minded scholars from throughout the whole Maya area. This insertion into the regional context allows for multiscalar analyses whereby we can zoom in to look at households and neighborhoods while maintaining the possibility to zoom out to analyze settlements and regions, all the while maintaining the focus on the ancient Maya of Yaxuná. By combining this multiscalar analysis with different academic and analytical frameworks (e.g., bioarchaeology, mortuary archaeology, culturally sensitive mainstream archaeology), the work in this volume spans the gamut of human existence in state-level societies, ranging from individuals and neighborhoods to cities and regions.

Given the long and intense traditions of stratigraphic excavation in areas of archaeological sites that often yield human remains in the northern lowlands (e.g., Andrews and Andrews 1980), the region represents an ideal area for this type of regional and also site-specific anthropological approach. From mortuary temples and caves to *cenotes* (sinkholes) and areas beneath household floors, northern Maya archaeologists have amassed and recorded detailed data on a tremendous amount of human remains over the last century on the final encounter of people with their understanding of the "otherworld." Many of these data have been studied in a cursory manner (mostly coming from salvage and restoration projects with little time and few resources to dedicate to the complete study of skeletal remains and burial

FIGURE. I.2. (a) Well-preserved articulated skeletal remains at Xcambó; (b) Xcambó's core area (photos by V. Tiesler).

contexts) or they have been contextualized in terms of individual sites. There are exceptions represented by a number of well-preserved archaeological skeletal populations from the coastal fringes of Yucatán—namely, the large burial series from Jaina, Xcaret, and Xcambó. The latter sample comprises some 600 dated and well-documented individuals from a Classic period trader population, recovered by an INAH team led by Thelma Sierra Sosa during the last decade of the twentieth century (Sierra Sosa et al. 2014a, 2014b) (figure I.2).

Over the past 15 years, two of the authors of this book (V. T. and A. C.) have been gradually building up a large database of skeletal remains from across the Maya lowlands, working out of Mérida in the heart of Yucatán (currently the sample stands at over 3,000 individuals).

This database is the accumulative result of several collaborative field and laboratory projects sustained by the Laboratory of Bioarchaeology and Histology at the UADY. The systematically recorded skeletal record along with the other extensively reported material remains at sites across the Yucatán Peninsula, benefits the successful contextualization of skeletal series from individual sites such as Yaxuná, the focus of this study.

Human existence is complex and even more so where social stratification exists—it is sometimes traced on the earthy remains. Human demise is always a rift in the social fabric—it registers palpably in mortuary practices. Understanding the complex tapestry of human interaction requires us to move beyond studies that focus on single sites as isolated entities in favor of research that places people in the complex regional and supraregional contexts that they would have moved through in the past. Like a puzzle, where every piece is essential but if taken alone does not provide the full idea of the final picture, bioarchaeological collections from single sites cannot be really usefully scrutinized without putting them into a regional context of larger studied populations. Background "noises," like poor preservation or contextual and osteological biases, still add to the challenges in interpreting human lifeways from the skeletal record, and comparison helps to mitigate these challenges. The ultimate purpose of this study is, beyond elucidating life at Yaxuná specifically, to address Classic period Maya society through the lens of its people, with their remains as testimony. We believe that contrasting the regional versus site-centered data can be widely applied to other sites in the Maya region and to all those other world areas, as well as periods, where such regional databases exist (e.g., Glencross and Boz 2014) or where they can be created. As we wish to illustrate in this volume, such a multidisciplinary, regional approach manages to contextualize the past in ways that neither traditional archaeology nor site-centered bioarchaeology can fully and thoroughly achieve.

THE COMING OF AGE OF MAYA BIOARCHAEOLOGY

Positioned at the interstices between archaeology and physical anthropology, bioarchaeology is well suited to offer a uniquely human view of our past, more so as its immediate study object is the human body (Buikstra and Beck 2006; Larsen 1997). Bioarchaeology may be broadly described as a thematic specialization in archaeology and/or physical anthropology that studies human remains in their context and as fundamental elements in the reconstruction of archaeological societies (see Blakely 1977; Buikstra 1997; Goldstein 2006; Powell et al. 1991). Thus, bioarchaeological analyses subscribe to the physical vestiges of those individuals who once shaped societies: those very same actors who forged regional and local history on a day-to-day basis (Sofaer 2006). In regional Mesoamerican research, bioarchaeological research is particularly important in studies of costume and body modifications such as dental decorations and head shaping of infants (Houston et al. 2006; Tremain 2011), as well as other important life issues, ranging from health and diet to occupational stress and migration (Katzenberg and Saunders 2000; Larsen 1997; Powell et al. 1991; B. Smith 1991).

There are different approaches to the study of the peoples who once inhabited ancient landscapes. While many bioarchaeological studies are site-centric, often a product of research strategies employed by the archaeologists collecting primary data, in this study we advocate for an approach that situates the remains of people from a single site in a broader regional context. This approximation allows for a more detailed and multilayered understanding of patterns discerned from skeletal and other material remains. Approaching site-specific skeletal collections from a regional perspective allows us to contextualize individuals buried at a particular place within the broader social and environmental landscape, within which they and their peers existed. It also opens consideration of different analytical scales while holding constant the focus of study—the site. Thus, bioarchaeologists can apply small-scale analysis to look at the individual households and neighborhoods while maintaining the possibility of taking a step back to analyze settlements and regions, thus providing different perspectives on the same data. This approach has the most utility where there is a large and diverse range of available archaeological and bioarchaeological data from the site itself and from other sites across the region. Skeletal and other material evidence are therefore best used in tandem to benefit more informed interpretations or, in this case, critique. Naturally, the amount of data and its diverse quality have a direct impact on the possibilities of generalization and for understanding the larger frames of past human behavior and existence. This panorama incorporates fields such as mortuary archaeology, mainstream archaeology, and a variety of archaeometric approaches, including studies on carbon (C) and nitrogen (N), and strontium (Sr) and oxygen (O) isotopes, respectively, for diet and place of origins.

Broad approximations to skeletal data are possible also thanks to the increasing influx of bioarchaeological contributions that Maya scholarship has produced since the 1980s. Such studies began in the early 1970s with a first systematic skeletal site appraisal conducted by Saul (1972) at Altar de Sacrificios, Guatemala. In the following decades, bioarchaeological approaches have gradually been gaining ground in Maya studies, as a number of edited volumes before the close of the last millennium already shows (White 1999; Whittington and Reed 1997; see Tiesler and Cucina 2014 and Scherer 2015 for a recent review of the literature).

While much of the early work in Maya bioarchaeology was still devoted to basic descriptions of, and inference from, skeletal remains, twenty-first century scholarship has been striving toward understanding the human sides of ancient Maya life. Traditionally, it has been epigraphers and art historians who have lent voices to the ancient Maya through their texts and their personal portraiture (e.g., Houston et al. 2006; Martin and Grube 2000). In this vein of humanizing the ancient Maya, bioarchaeological datasets are also suited to complement these more discursive examinations by contributing novel insights into those sectors of the population, such as commoners, children, and women, who are less often found in the male-centered elite art and texts.

Despite the fact that many of the current research strategies in regional Maya bioarchaeology do not differ substantially from those pursued in the past decades, skeletal analysis has increasingly reached out to other disciplines (e.g., Sierra Sosa et al. 2014a, 2014b; Scherer 2015; Tiesler and Cucina 2006; Wright 2006). Aside from ever more sophisticated statistical analyses and a host of special studies on bone and dental substrate, biocultural, multidisciplinary approaches are gaining increasing attention in regional scholarship working with burial remains. Despite some resistance to fully integrate bioarchaeological studies into archaeological research designs, in recent years the analysis of skeletal materials has increasingly responded to parameters set forth by multidisciplinary or specifically bioarchaeological agendas that favor the integration of biological and cultural datasets (Buikstra 1997:223; Cucina and Tiesler 2005:30; Tiesler and Cucina 2014).

By examining the literature, it is clear to see that most Maya territories have become the focus of broad yet explicitly "bioarchaeological" studies. For example, correlations between subsistence patterns, paleopathology, and social status distinguish a number of recently published works both for pre-Hispanic (Cucina and Tiesler 2003; Cucina et al. 2011a; Marquez Morfin et al. 2006; Méndez Colli et al. 2009; Ortega 2007) and colonial times (Tiesler et al. 2010a). The new millennium has witnessed the establishment of new approaches for the reconstruction of biological affinity patterns and mobility, through the analysis of morphological and morphometric traits (Cucina 2015; Duncan 2005; Scherer 2007; Tiesler and Cucina 2012a; Wrobel 2004), or of individual movement thanks to sophisticated chemical techniques on trace elements, and strontium (Sr) and oxygen (O) isotope analyses, as well as through the combination of these different indicators (Cucina et al. 2011b, 2015; Price et al. 2006, 2008, 2012, 2014, 2017; Sierra Sosa et al. 2014a, 2014b; Wright 2005a, 2005b; Wright et al. 2010). The morphological and morphometric studies at local and regional scales, though limited by looming interobserver variations and small sample sizes, offer a starting point for a new overall appraisal of Maya biological group affinities and macroregional evolvement in an effort to foster a new biologically grounded definition of what is Maya. In turn, the standard incorporation of new chemical techniques by both archaeologists and bioarchaeologists has already provided valuable novel input on resolving old and new hypotheses on topics such as Maya migration, population history, and diet.

Finally, Maya bioarchaeology has had an impact also on the taphonomy of human remains. For example, the analysis of postmortem changes suffered by the body has been applied in attempts to reconstruct the varied and often complex posthumous body treatments that characterize ancient mortuary Maya traditions, an essential element for a thorough reconstruction of past societies, as underlined by Goldstein (2006). Human taphonomic research, based on the concepts set forth by forensic research or the French *anthropologie de terrain* ("field anthropology" [Duday et al. 1990]—now called "archaeothanatology" [Duday 2009])—has been applied both to case studies (Pereira 2013; Pereira and Michelet 2004; Tiesler et al. 2010b) and to regional mortuary behavior in general, be it reverential or postsacrificial (Duncan 2005; Tiesler 2007). Considered jointly, the fruitful combination of research tools and academic lenses has resulted in the creation of a vibrant mosaic of Maya bioarchaeological investigation that, in conjunction with archaeological, epigraphic, iconographic, and ethnohistoric data, is set to propel a better understanding of what it meant to be Maya in different eras and places on the cultural landscape.

Inserting these types of bioarchaeological analyses into the larger, academically founded narratives of Maya society has been slow. It is unfortunate that most published archaeological syntheses of the northern Maya still appear to neglect the territory's residents themselves.

As a matter of fact, mainstream archaeology in this area (not dissimilar to other areas of the world) still relies heavily on concepts such as ceramic spheres and settlement patterns to understand larger sociopolitical complexities and cycling, dissociating interpretations based on the study of human remains from other material categories. We believe that this proclivity translates into a biased, mechanical, and shortsighted perception of past economic dynamics, social shifts, and political processes.

YAXUNÁ AS A TEST CASE

It was this general lack of a human dimension in northern lowland Maya archaeology that provided us with the initial inspiration to write this book using the burial series from Yaxuná as the cornerstone of historical reconstruction. These data speak to the quotidian facets of growing up, changing residence, eating, combating illness and death, the physical looks of people, and the drama of natural or ritually caused death—things that mattered in the daily lives of the ancient Maya. Our inquiries into the human side of ancient Maya kingdoms do not stand as isolated efforts, of course, but instead follow in the footsteps of a number of prior studies converging on body-anchored information (see Houston et al. 2006; Saul 1972; Scherer 2015; Tiesler 2012, 2014; Tiesler and Cucina 2006; Tiesler et al. 2010a, 2010b; White 1999; Wright 2006; Whittington and Reed 1997).

The site of Yaxuná is located in the northern Maya lowlands in the modern state of Yucatán, Mexico. While the number of skeletons (the majority dating to the Classic period [AD 250–900]) excavated from the site itself is relatively low (N = 48), Yaxuná provides an interesting test case for our regional approach for several reasons. First and foremost of these reasons is the long history of research at the site, spanning almost one century (figure I.3). Four distinct archaeological projects have conducted stratigraphic excavations at Yaxuná, resulting in a broad base of knowledge of the archaeology of this ancient city (e.g., Ardren 1997; Brainerd 1958; Freidel 1987, 1992, 2007; Novelo Rincón 2012; Stanton et al. 2010; Stanton and Magnoni 2013; Suhler 1996; Suhler et al. 1998a, 1998b; Toscano Hernandez and Ortegón 2003; see chapter 1 for a broader view). The depth of previous research helps us to put the ancient people at Yaxuná into context much better than we can for many other archaeological sites in the northern Maya lowlands, while ongoing research, currently directed by Travis Stanton and Traci Ardren, continues to refine our understanding of the site and the region (figure I.4).

Second, the ancient city looks back on a very long and continuous occupation, spanning the Middle Formative (1000/900–300 BC) to the Terminal Classic (AD 700/750–1000/1100) periods. Even after the abandonment of the site during the Terminal Classic, people continued to bury their dead in repositories within the ruins. In fact, after the Spanish conquest a substantial Colonial/Historic period occupation covered sections of the former pre-Hispanic capital, resulting in the burial of at least one individual dated to postcontact times (Stanton et al. 2010). This extended timespan gives us the opportunity to frame the life and death of the ancient people of Yaxuná with even greater historic depth.

FIGURE I.3. Group photo of the Selz Foundation project in 1996 (Selz Foundation).

FIGURE I.4. Photo of the UADY bioarchaeology team recovering Burial 27 at Yaxuná (photo by S. Simon).

Third, apart from the extended time dimension at Yaxuná, the existing regional database anchors the case study of Yaxuná within broader population and cultural dynamics. The Maya lowlands is one of the most researched areas of Mesoamerica, with the state of Yucatán and the country of Belize being foci for particularly intensive and extensive research over the past since the late 1980s. This comparative database makes most work in the Maya lowlands amenable to the type of regional analysis proposed here but particularly in Yucatán where Yaxuná is located.

Fourth, Yaxuná is located at an important crossroads in the Maya area, resulting in the intersection of styles and people in what we envision to have been a city with a fairly high degree of multiculturalism. Yaxuná is located at the borders of the eastern and western cultural spheres of the northern Maya lowlands (see Andrews and Robles 1985; Freidel 1992). Its continued cultural ties to the southern lowland kingdoms—from the Formative period through the Late Classic—indicate that it was an important hub of interregional trade networks from the time of its initial establishment (Brainerd 1942; Loya Gonzalez and Stanton 2013, 2014; Stanton 2012).

Fifth, two of the few known Classic period royal tombs from the northern territories were found at Yaxuná (Suhler 1996; Suhler and Freidel 1998). Both of these contexts date to the Early Classic and give us a rare view into dynastic rule in the north. Finally, given the close location of Yaxuná to the Terminal Classic metropolis of Chichén Itzá and its connection to the east to the Late Classic power of Cobá by way of the longest-known Maya causeway (*sacbé*) (100 km), Yaxuná is in a unique position to offer a greater understanding of the sociopolitical dynamics of some of the most important urban states of the Maya Classic period.

Apart from our targeted research design, the choice of Yaxuná as the site-centered focus of this regional study has much to do with timing. The creation of the regional skeletal database was a process that took years in the making. The quantity and quality of analyses of the individuals represented in this database, which result from research projects conducted at the UADY directly or under the supervision of two of the authors of this book (V. T. and A. C.), has reached a point now that the data collection can be adequately used as a contextualizing tool to understand the remains of the social actors at individual sites, even in cases where the sample size is not particularly large, such as in Yaxuná. The issue of sample size will be addressed by studying locals as part of much larger populations who were interacting with each other to varying degrees, benefiting a much more nuanced study of bioarchaeology in the Maya area and the lives of people in one particular community, in this case Yaxuná.

A ROADMAP FOR THIS BOOK

The organization of the volume follows its central goals and is structured according to core aspects of life- and deathways. Chapter 1 provides the groundwork for what follows by situating Yaxuná in a regional context while leading the reader through a detailed discussion of the previous work conducted at the site. The chapter explores what we currently know about social, economic, political, and ideological trajectories of the people who lived in the area from the beginning of the Middle Formative (ca. 1000–900 BC) to the Spanish invasion in the sixteenth century. This survey provides the backdrop for understanding the remains of the ancient settlers of Yaxuná and serves as an interpretive framework for creating a period-by-period working narrative using different skeletal data as cornerstones. A recount of colonial and postcolonial Maya experiences in the core of Yucatán rounds out our archaeological chronicle.

The archaeological and cultural overviews of chapter 1 set the stage for examining ancient population dynamics and mobility in Yaxuná and beyond in the next chapter. Yet how may we infer the place of origin of those who died in Yaxuná, as well as identify those who emigrated out of the area to reside elsewhere? To address these and similar questions through a bioarchaeological lens, we combine different approaches. First, individual provenience is analyzed in all individuals by means of strontium and oxygen isotopes, a methodological tool recently adopted by Maya bioarchaeology (Price et al. 2008) that allows researchers to discern individuals of distant geographic origins from those who are likely local folk. Specifically, the isotopic information used in this chapter derives from the individual isotopic data published by Price and his colleagues (2017) and reelaborated according to sex.

Our second approach to mobility explores the biological distances (or in some cases affinities) of individuals from Yaxuná to other groups from the area. To this end, we use sets of dental morphological traits, which are heavily conditioned by genetics. Microevolutionary theory holds that those human groups in close biological contact with one another show blending of traits. Inversely, prolonged reproductive isolation will lead to a progressive dissimilarly in traits. Thus, by using dental morphology as an indicator, we attempt to identify movements of people in and out of this socially dynamic community.

Moving on to demography, lifestyle, and health issues, chapter 3 explores the basic biovital information of the individuals represented in the Yaxuná sample. Translating the biological concept of sex into gender (a cultural construct) and the concept of biological age at death into social age groups and age-related horizontal stratification, we interpret and discuss the people from Yaxuná collectively as social actors in a changing society. Analyzing biovital data in relation to mortuary spaces, residential areas, and funerary equipment will allow us to address broader questions of inequality, specialization, and social organization. Here we will also touch on other relevant aspects, such as life expectancy, childhood mortality, physiological stressors, and physical loads on women and men. More general questions regarding growth potential and retardation, as well as adult health and lifestyle, are addressed by scrutinizing stress markers in our skeletal series.

Foodways, dietary habits, and lifestyle will be the focus of chapter 4. Chemical analyses focus on the relative proportions of C^{12}, C^{13}, N^{14}, and N^{15} stable isotopes, expressed by their δC^{13} and δN^{15} values, which are used to assess respectively the extent of C3 versus C4 plants in the diet and the individuals' trophic level in relation to protein consumption. Concurrently, we use indirect indicators of dietary intake, such as faunal data (Götz and Stanton 2013), and focus on diet-related health issues, such as oral pathologies (e.g., carious lesions) and dental wear, to discern the nutritional quality of the Yaxuná Maya. Compared to other material datasets such as cooking and serving implements, as well as faunal data, we contextualize the foodways in relation to social status, sex, and gender.

In the next chapter (chapter 5) we move on to examine physical embodiment and social identities at Yaxuná. Here we elaborate specifically on those permanent body modifications that have left traces in the skeletal remnants of the living—namely, dental decoration and head shaping. Both practices were commonly performed by the Classic period Maya, leading to visible changes in the appearance of head and teeth in the living, and to changes in dental and cranial morphology in the skeletonized dead. After briefly addressing the techniques, instruments, and health risks involved in their execution, we discuss some of the ideological roles of specific artificial head forms and dental reductions. This analysis draws also on regional comparison of Maya body modifications, specifically on areas such as the southern Maya lowlands, the coast, the Puuc Hills, and the central and eastern northern lowlands (Tiesler 1999, 2012, 2014).

Local funerary traditions are communicated by the arrangement of the body (or in some cases body parts), funerary spaces, and burial goods or equipment. In chapter 6 we focus on the breadth and depth of local mortuary practices at Yaxuná, the collective ancestral beliefs and related ritual behaviors. Their physical remnants have been principally found underneath the floors of domestic structures. Here we primarily reconstruct the mortuary pathways of different forms of body preparation, deposition, and posthumous manipulation during the Late and Terminal Classic, from which we date all the burials from domestic contexts in our sample.

The lives and deaths of two rulers and their posthumous treatments are addressed in chapter 7. The focus of our attention are Burials 23 and 24, two Early Classic royal burial chambers discovered during the early 1990s by the Selz Foundation project (Suhler 1996). A step-by-step reconstruction of the preparations, depositions, and subsequent visits introduces a contextual analysis of the symbolism in the bodies and the artifacts of the tombs. There is suggestive evidence that Burial 23, dating to the fourth century AD, represents the first dynast to rule at Yaxuná. This king shows ties to the Kaanul, the Land of the Snake Kings, further south. In the case of Burial 24, a later tomb dating to the fourth or possibly early part of the fifth century AD, there is convincing taphonomic evidence that the ruler was ritually sacrificed along with an entourage of men, women, and children. This literal decapitation of the state at Yaxuná is accompanied by artifactual and iconographic evidence that the conqueror was associated with the Teotihuacan-inspired *entrada* (arrival) of Sihyaj K'ahk' documented in the southern lowlands (Schele and Freidel 1990; Stuart 2000). The new order of kingdoms that were aligned with Teotihuacan and Sihyaj K'ahk' after AD 378 were ruled by adversaries of Kaanul kings. Could Yaxuná have functioned as a northern vassal kingdom conquered by the forces of Sihyaj K'ahk'? Why was Burial 23 reentered, and why were some of the materials contained in it carefully manipulated to graph as the immediate ancestor of the sacrificed king in Burial 24? We will discuss these and other questions in regard to the politics of Maya ancestor veneration versus desecration.

In chapter 8, we shift our discussion regarding the last rites for Yaxuná's populace toward the treatments of individuals found in particular contexts suggesting their role in offering rituals, often involving sacrifice. Most sacrificial killings stand in stark contrast to reverential treatments of the deceased from the Maya area. Some of the contexts discussed in this chapter stand out by presenting cut-marks from flaying or dismemberment, or other expressions of deviant sepulchral behavior. We will compare these interments of sacrificed individuals to body treatments that we have documented in other coeval Maya sites and confront them to later forms of body processing, such as those known from Chichén Itzá.

Finally, in chapter 9 we tie the lines of argument and survey to situate the ancient Maya of Yaxuná into the larger regional context. A theoretically informed and contextualized discussion offers glimpses of Yaxuná and its people in the larger arena of Classic period sociopolitical dynamics, more so as Yaxuná played an important role in the political and economic scheming of some of the most important polities across the lowlands during the Classic period, including Cobá, the Puuc centers, and the distant Petén kingdoms. These shifting social and biocultural dynamics, in the form of urbanization and sociopolitical reproduction, operated successfully for centuries before and during the arrival of the Itzá.

PART I

LIVING AT YAXUNÁ

1
YAXUNÁ IN CONTEXT

ALTHOUGH THE ARCHAEOLOGICAL SITE of Yaxuná is not open to the public, the area is accessible by car. Driving east from Mérida on the federal highway toward Valladolid, one turns south at the tourist hub of Pisté, on the western edge of the ancient city of Chichén Itzá (figure 1.1). Following for twenty minutes a narrow road that crosses fields overgrown with thick, scrubby vegetation, one can begin to make out the looming acropolis groups that are near the road just before you enter the sleepy Maya hamlet of Yaxunáh (plate 1.1). The community's name means "green house" or "first house" in Mayan, the latter a particularly relevant name considering the great antiquity of the ruins.

Now a hinterland locality of the Yaxcabá municipality, this space once formed part of a substantial Maya city. Its origins date back to the very beginning of Maya civilization and set the community on a course toward a highly complex series of transformations over its 2,000 years of pre-Hispanic occupation. Situated on a critical crossroad of Maya civilization, material evidence suggests that this community was founded on an inland trading route linking the emerging southern lowland kingdoms to the salt flats of the northern Yucatecan coast, a connection that likely contributed to the movement of people and ideas between the north and south for over a millennium (Freidel 1992, 2007; Stanton 2012; Suhler 1996). Yet its central location on the northern plains also placed Yaxuná on the fairly distinct cultural boundary between the eastern and western portions of the peninsula. In short, the location of Yaxuná exposed it to higher degrees of interregional contact within the Maya world than many of its peers on the northern plains, a situation we explore in this book using human remains.

While the burial data currently available from Yaxuná come primarily from Classic period contexts (no Formative period human remains have been recovered to date, and only two burials date to later contexts, one to the Postclassic and one to the Historic period), extensive material data from the site have been used to create a narrative of Yaxuná from its origins to its eventual state of ruin today. In this chapter we orient the reader to this narrative with the intention of placing the remains of the ancient Maya and their mortuary contexts in an

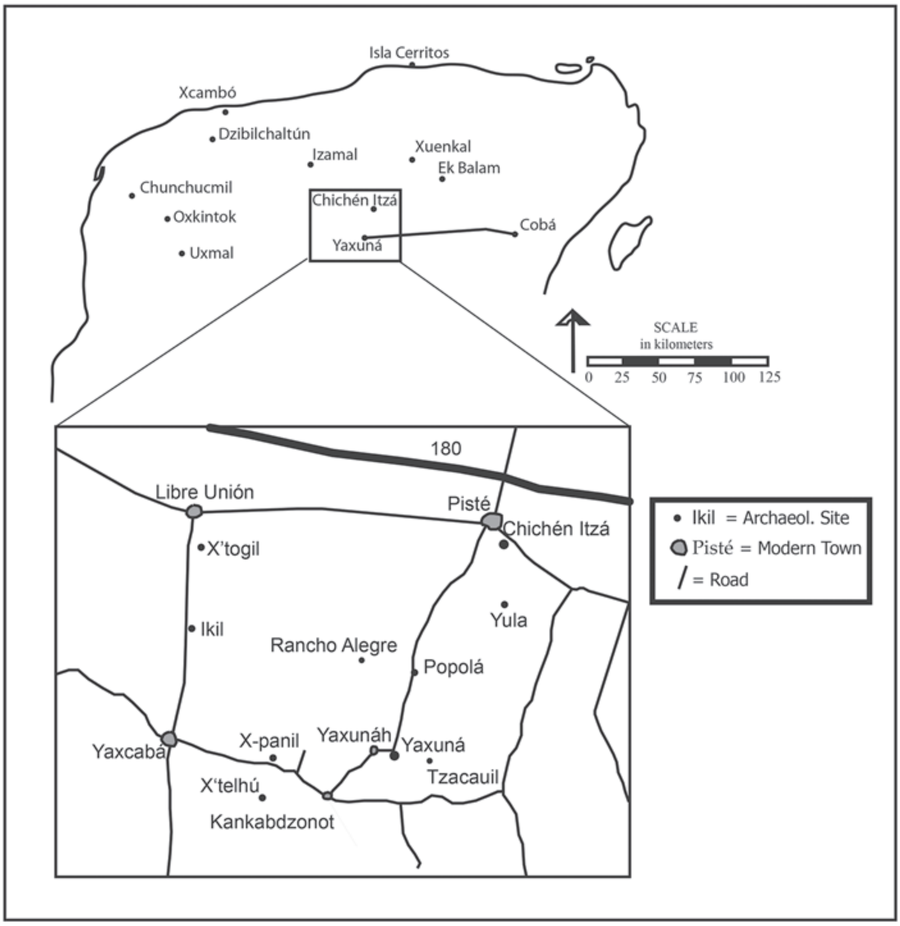


FIGURE 1.1. Map of the Yaxuná region.

understandable cultural and historical framework that will help to contextualize our skeletal and mortuary data. We begin with a discussion of the previous work conducted at the site and then move to a period-by-period treatment of the cultural sequence as it stands today.

A BRIEF HISTORY OF RESEARCH AT YAXUNÁ

Yaxuná first called the attention of researchers working at Chichén Itzá during the 1920s and 1930s. The Carnegie Institution projects at Chichén Itzá and Uaxactún were the first to conduct large-scale systematic research in the Maya area (Kidder 1947; Morris et al. 1931; Ricketson and Ricketson 1937; Ruppert, 1931, 1935, 1943, 1950, 1952; A. Smith 1937, 1950; R. Smith 1955; Smith and Gifford 1966). Given the size and preservation of Chichén Itzá, as well as references to this city in ethnohistoric documents and the copious amount of

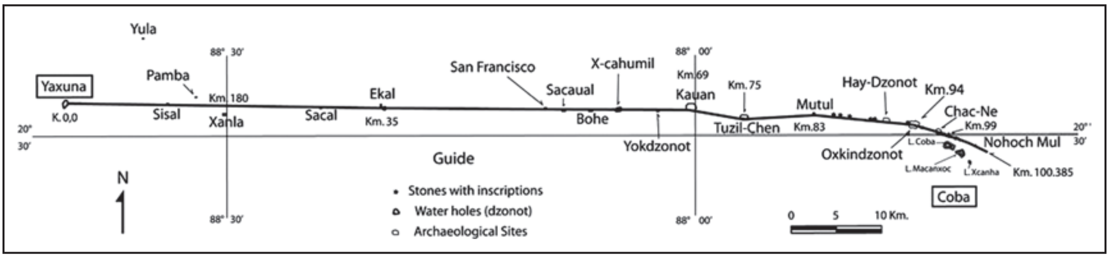


FIGURE 1.2. Map of Sacbé 1 between Yaxuná and Cobá (redrawn from Villa Rojas [1934] by Tatiana Loya).

preserved iconography at the site, Sylvanus Morley established a research project there to serve as the cornerstone of what quickly evolved into a regional project with reconnaissance, mapping, and test excavations conducted at sites throughout the northern lowlands (e.g., Brainerd 1958; Ruppert and Smith 1957; R. Smith 1971). In particular, Yaxuná attracted the attention of the Carnegie archaeologists due to the fact that a long causeway (Sacbé 1—white road in Yukatec Maya) connected this city to the metropolis of Cobá located 100 km to the east. This raised road still stands as the longest Mesoamerican causeway known today (Morley 1927a, 1927b).

Although Bennett (1930) was the first explorer to record the *sacbé*, it was a cultural anthropologist working at the community of Chan Kom, near where the causeway passes, who first mapped it during the 1930s (Villa Rojas 1934; see figure 1.2). Impressed with the length of the causeway, the Carnegie archaeologists were particularly interested in how it might link the chronological sequence of Chichén Itzá (believed at the time to date primarily to the Early Postclassic [Brainerd 1958; Kidder 1930; Thompson 1954; Tozzer 1957])[1] to the Classic period Petén sequence of Uaxactún (R. Smith 1955; Smith and Gifford 1966). Given that one end of the *sacbé* ended at Yaxuná, located a mere 18 km to the southwest of Chichén Itzá (as measured between the site cores), Carnegie archaeologists decided to survey the site. During several short seasons they created a rough map and excavated test trenches in monumental contexts (Brainerd 1958).

Ceramic data from these early excavations at Yaxuná indicated that this city had both early (Late Formative and Early Classic) and late (Late and Terminal Classic) occupations (Brainerd 1958) that could bridge the chronology between the "old" and "new" empires. Most research in the north at this time was concentrated on the well-preserved Late and Terminal Classic architecture, leading to a perception that there was a "New Empire" in the north postdating the "Old Empire" of the south where research at the time had exposed earlier Formative and Early Classic occupations. In any event, Thompson and his colleagues (1932) believed that the later chronology of Chichén Itzá could be identified at Yaxuná and stratigraphically understood in relation to the earlier occupation they rightfully believed to exist there. Thus, research efforts targeted the early chronological sequence of Yaxuná together with its causeway connection to the Classic period city of Cobá, more readily associated with the southern lowland chronology, given the Petén influence in the architecture, iconography, and hieroglyphic inscriptions (largely unreadable at the time) of this eastern city.

In the end the early explorations of Yaxuná (Brainerd 1940, 1958; Roberts 1933, 1935), of its long causeway (Villa Rojas 1934), and of Cobá (Thompson et al. 1932) did little to resolve the chronological placement of Chichén Itzá in reference to Uaxactún and other sites in the southern lowlands. At least for the site of Yaxuná itself, the survey did reveal to researchers that there was an important early northern lowland occupation (Thompson 1954). No human remains were ever reported by this project.

After these initial efforts, Yaxuná was largely forgotten by archaeologists during the following decades. Coggins (1983) noted that the only carved stela (figure 1.3), reported by Brainerd (1958), showed an individual who was garbed in the style of the Early Classic central highland metropolis of Teotihuacan (wearing a *pecten* shell necklace and feathers hanging from the back of his belt). This led scholars to cautiously engage the possibility of central Mexican contact with the northern Maya lowlands. At the time, such contact had been much better demonstrated for the central and southern lowlands, where a trove of monumental portraiture, laden with central highland symbolism and garb, made a strong case for direct cultural exchange with Central Mexico long before the Maya collapse and the rise of Chichén Itzá (Coggins 1975, 1977).

As the decipherment of Maya hieroglyphic writing and advancements in art history revolutionized our understanding of the Maya during the 1970s and 1980s, new light was cast on courtly life and the complex relationships among central lowland kingdoms and dynastic rule (Martin and Grube 2008). In particular, the Palenque Round Table Meetings served as a platform for researchers to better understand ancient sociopolitical dynamics during those years. Despite the progress, northern lowland centers such as Yaxuná were left out of the new narratives that were being created for Classic Maya society, as they lacked the extensive epigraphic texts and iconography that characterize their southern neighbors. If discussed, most northern cities were framed in terms of the southern data, as the idea of cultural variability between these two regions was still not being engaged at this time.

It was not until Andrews and Robles (1985) posited that Yaxuná functioned as a western outpost of the Late to Terminal Classic state of Cobá that interest in the site was revived. In their argument, Andrews and Robles assumed that Sacbé 1 served to integrate Yaxuná into a Cobaneco state rather than facilitating exchange and mobility among equals. This conjecture rested on the much greater size of Cobá in comparison to Yaxuná and on the patent lack of evidence (at this time) of Sotuta ceramics both at Cobá (Robles 1990) and Yaxuná (Brainerd 1958). In this scenario, Yaxuná was seen as the western stronghold of Cobá, one that served as a buffer to withstand the growing power of Chichén Itzá. Andrews and Robles elaborated on this conjecture to the point of speculating that Itzá warriors must have encountered "massive resistance" at Yaxuná (Andrews and Robles 1985:69).

The role of Yaxuná as a strategic border community in the heart of the northern Maya lowlands was to be tested by David Freidel (1987), who started work at the site in 1986. What was to follow was a decade of intensive field explorations, with the final season ending

FIGURE 1.3. Carved stela, which displays an individual dressed in the style of the Early Classic central highland metropolis of Teotihuacan (photo by Yaxuná Project, Selz Foundation).

in 1996 (see Stanton et al. 2010:1–4); laboratory work ended in 1997. During this period the site center was mapped and stratigraphic excavations were conducted in numerous areas of the site. In 1989 the first test excavations targeted both residential and civic contexts of the settlement (Freidel et al. 1990), and during the following seasons the test-pitting program was extended across the site core, specifically targeting domestic structures (Ardren et al. 1994; Suhler and Freidel 1993). More extensive excavations at two "elite" residential platforms near the site center (5E-52 and 5E-73 groups) were also undertaken, where three more burials were located (see Shaw 1998; Stanton 2000).

Other extensive excavations were directed at civic and/or monumental contexts in the site core. These excavations included, among others, Charles Suhler's (1996) research of a pair of Formative period dance platforms located directly to the east of the East Acropolis. Traci Ardren (1997) explored the acropolis at Xkanhá, a peripheral Classic period architectural complex located two kilometers to the northwest of the site center, where she recovered a single burial. Most of the extensive work was performed at the North Acropolis and specifically at structures 6F-3, 6F-4, and 6F-68 (Ambrosino 2003, 2007; Suhler 1996). Highlights of this research included two Early Classic royal tombs located in structures 6F-3 and 6F-4 (Ardren 2002; Suhler 1996; Suhler and Freidel 1998) and the discovery of an abandonment deposit interpreted as the remains of a desecratory termination ritual (cf. Stanton et al. 2008) at Str. 6F-68, including one disturbed human deposit (see Ambrosino 2002, 2007; Ambrosino et al. 2003; Ardren 1999). In all, six doctoral dissertations (Ambrosino 2007; Ardren 1997; Johnstone 2001; Shaw 1998; Stanton 2000; Suhler 1996) were completed from the Selz Foundation project work, and research was conducted in a wide range of contexts spanning the Middle Formative (Stanton 2000, 2005a; Stanton and Ardren 2005) to the Late Postclassic (Ardren 2003). Sadly, a preliminary study of the skeletal remains initiated by Sharon Bennett (1993) was never completed due to her premature death.

In 1997, Lourdes Toscano Hernández of the Instituto Nacional de Antropología e Historia (INAH) reinitiated excavations, focusing her efforts in the area between the North Acropolis and Central Acropolis. Her project was envisioned to open an area of the site for tourism and focused primarily in a segment of Yaxuná termed the Puuc Group, although excavation was also conducted at the terminus building for Sacbé 1 (Str. 6E-13) and several small civic structures in the center of the site core. The primary contribution of this project was the architectural seriation of the Early Puuc through Classic Puuc buildings in an area identified as an Early Puuc Ceremonial Complex (EPCC) (Novelo Rincón 2012). This project also identified a small Late/Terminal Classic (Sotuta) village among the ruins of the site (Toscano Hernández and Ortegón Zapata 2003). Several burials were recovered by this project but have not been included in our study.

Although Toscano Hernández and her team completed explorations and structural consolidation five years later, in the end Yaxuná was never opened to the public. In 2005, she followed up her work by conducting a salvage project on the road between the modern towns of Pisté and Yaxunáh. Over 200 structures in a 21 km wide by 40 m long transect along the road were tested or horizontally exposed (Toscano Hernández et al. 2005a, 2005b). This transect began in the western peripheral area of Chichén Itzá and ended right in the vicinity of the core of Yaxuná. Toscano Hernández (personal communication to Stanton, 2011) reported that nearly all of the structures in the survey date to the Late and Terminal Classic periods, thereby indicating a low level of rural settlement in the region prior to AD 600, similar to findings of the Proyecto de Interacción Política del Centro de Yucatán–(PIPCY) in a regional survey (Magnoni et al. 2016). Of note is the division in Slate Ware ceramics that Toscano Hernández and her team noted along the transect. While Cehpech-style ceramics were recovered from the excavations around the site of Popolá and to the south, Sotuta ceramics dominated the northern segment of the transect, indicating distinct ceramic distribution systems, possibly reflective of political tensions (cf. Freidel 1992, 2007) and/or distinct market economies (see Dahlin et al. 2007) during the Terminal Classic. Several burials were recovered by this project within the site boundaries of Yaxuná, but, once again, have not been included in the present study. Around the same time of Toscano Hernández's survey, Travis Stanton (2006) conducted a short regional survey in the area in preparation for a new project in the Yaxuná region. This work included sketch maps and surface collections at the surrounding sites of Ikil, X'telhú, and X'togil (figure 1.1).

In 2007, the PIPCY project was formally initiated by Travis Stanton, Scott Hutson, and Aline Magnoni (2008). This project was envisioned as a regional exploration of the area to the southwest of Chichén Itzá, with Yaxuná remaining the focus of work. Although the Selz Project had conducted limited mapping at a couple of sites in the region (specifically at X'telhú and Popolá, where carved monuments had been reported [Greene Robertson 1986]), not much regional work had been previously undertaken to understand the broader regional contexts. While the PIPCY project still continues (Stanton and Magnoni 2009a, 2009b, 2013, 2014a, 2014b), we briefly summarize the work to date in the following paragraphs.

Excavations at Yaxuná have concentrated on the 6E-30 Group (a large domestic platform in the southern portion of the site core spanning from the Middle Formative through the Terminal Classic periods), the 5E-50 Group (the probable Early Classic palace at the site [see Freidel et al. 1998]), the E-Group (a Formative period ritual space), and a large trash pit laid down on top of a collapsed cave associated with the North Acropolis (Gómez García 2012; Marengo Camacho 2013; Stanton and Marengo Camacho 2014; see figure 1.4).

Particularly interested in the origins of Yaxuná as a Middle Formative community (research at 6E-30 Group and the E-Group) and the impact that the founding and growth of the urban center of Chichén Itzá had on its surrounding hinterlands (research at the North Acropolis and smaller regional sites), the PIPCY project has made substantial progress in revising the narrative created by previous work. Additionally, a regional survey of over 500 km^2 is being conducted (primarily in the *municipio* of Yaxcabá). The survey has concentrated on surface sites as well as caves and cenotes (Slater 2014a; Stanton and Magnoni 2013). To date, in addition to numerous sketch maps and surface collections, large-scale mapping efforts have been conducted at the sites of Ikil, Joya, Popolá, X-auil, and X-Panil (Hutson et al. 2012b; Johnson 2012; Magnoni et al. 2014a; Robles Salmerón et al. 2011; Stanton and Magnoni 2013), and LIDAR (Light Detection and Ranging) survey has been conducted over parts of the region. Test excavations have been conducted at Cacalchén, Ikil, Joya, Popolá, and X-Panil, while more extensive horizontal excavations have carried out in domestic contexts at Ikil and Popolá, as well as in caves at Aktun Jip, Aktun Kuruxtun, Ceh' Yax, and Ikil (Johnson 2012, 2014; Slater 2014a, 2014b; Stanton and Magnoni 2014a).

Since 2011, PIPCY has cultivated a close collaboration with the team working at the Laboratory of Bioarchaeology and Histology at the Autonomous University of Yucatan, Mérida (UADY). The joint efforts include on-site burial recording, restoration, inventory, lab analyses, and, in the case of the burials recovered by the Selz Foundation project, also interpretation of photographic imagery. Additional scholarly input has been provided by a host of archaeometric analyses, the results of which are treated profusely in chapters 2 through 7. Zooarchaeological studies conducted on material from both the PIPCY and Selz projects

FIGURE 1.4. Map of Yaxuná highlighting major groups and the structures where human remains were found.

have also contributed to a more complete understanding of the human skeletal remains, specifically in terms of dietary preferences and accessibility of resources, topics discussed in chapters 3, 4, and 7. These studies have been conducted and reported by our UADY (late) colleague Christopher Götz (Götz and Stanton 2013).

THE ORIGINS OF YAXUNÁ

Since Suhler's (1996; see also Johnstone 2001) assertion that Yaxuná was established as a "green-field community" around 500 BC, much more work has been advanced across the Maya lowlands concerning the origins of Maya civilization and Yaxuná in particular. First and foremost we now have a better understanding of human occupation on the Yucatán Peninsula prior to settled life. A group of divers has recently discovered a submerged cenote floor, which they found littered with extinct late Pleistocene animals and a single female adolescent, presumably the oldest directly dated human remain in the Americas at 12,000–13,000 BP (Chatters et al. 2014; Tiesler 2016). Named Naia by those working on the context, this teenager had fallen into a large underground sinkhole, most likely after getting lost inside the extensive network of dark karstic tunnels. A broad interdisciplinary study, now under the umbrella of the INAH-led Hoyo Negro Project, is currently working on a fuller reconstruction of living conditions during this important early period of human occupation on the peninsula (Tiesler 2016). Naia probably represents the first known wave of continental immigrants (Chatters et al. 2014); back then, the climate was more temperate and the peninsular shelf itself was much larger than it is today because of a much lower sea level during the last ice age at the end of the Pleistocene era. Apart from this isolated finding, we know vaguely that the Yucatán Peninsula was inhabited by early Paleoindian populations, although still very little is known about these people (see Chatters et al. 2014; González González et al. 2006, 2008). The Archaic period is slightly better understood, although most of the finds have been limited either to haphazard cave findings, just as the one described above (e.g., Iceland 2005; Lohse 2010), or have been found mixed with later Middle Formative materials (M. Kathryn Brown, personal communication to Stanton 2013).

Settled life appears around 1100–900 BC in areas across the Maya lowlands; it is at this time that ceramics appear, marking the beginning of the Middle Formative in this area of Mesoamerica (figure 1.5). While there is still much to be learned concerning the transition from Archaic period lifestyles and conditions to sedentary communities that depended on agricultural lifeways, evidence indicates a gradual rise in population over the course of the Middle Formative.

Incipient sacred centers, particularly early E-Groups, were initially established as gathering places that functioned to facilitate social interaction and identity construction much like Poverty Point or Göbekli Tepe (Inomata et al. 2015; Stanton et al. n.d.a). To put this idea in less abstract and more institutional terms, people with relatively mobile lifestyles who were practicing gardening to supplement wild food sources may have found gathering together at

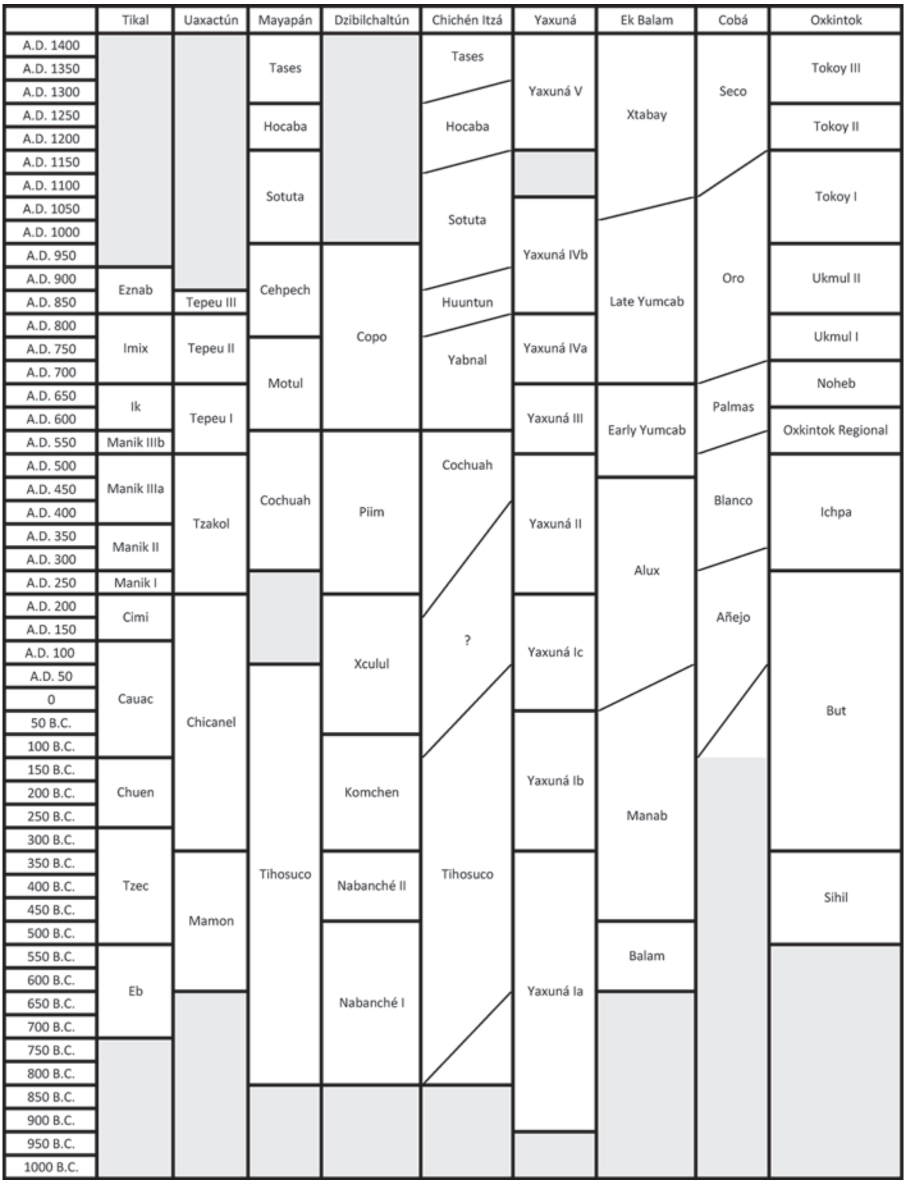


FIGURE 1.5. Chronology at Yaxuná in comparison to other lowlands Maya sites.

particular places and at particular times of the year to be useful for exchanging goods, adjudicating disputes, arranging marriages, practicing healing rituals, and celebrating common relations with the supernatural world. Such collective interests required leaders of some kind to organize the design, construction, and maintenance of such places. While leaders can emerge from existing institutions such as families and larger kin groups, they often act as agents in the innovation of new institutions that crosscut kin groups and sustain larger communities through the very act of making and maintaining centers. Just how such new institutional agents eventually emerged as members of councils and rulers remains difficult to define, but we review the evidence in hand. Given the presence of a large E-Group from the center at Yaxuná itself, we are confident that local leaders participated in pan-peninsular institutions, sodalities being a neutral term for such brotherhoods and sisterhoods (Service 1975), from the beginning. Over time these centers grew. The regional populations who maintained some degree of residential mobility eventually settled and adopted agriculture as a way of life.

Settling and the adoption of agriculture appears to be the scenario at early Yaxuná as well. In our study region we have found Pleistocene faunal remains (Slater 2014a) but no clear evidence of human activity despite the pollen evidence suggesting some forest clearance prior to, or around the time of, the appearance of pottery (Zimmerman 2013; see also Leyden 2002; Leyden et al. 1998). Excavations at the E-Group indicate that the first floor was constructed around 900–800 BC if not slightly earlier. These dates correlate well with a ceramic deposit dated to the ninth century BC consisting of a fragmented Yotolín Burnished vessel mixed with Early Nabanché Complex ceramics lying directly on top of a level containing the Pleistocene remains in Aktun Kuruxtun (Slater 2014a).

The above-mentioned E-Group is indeed the earliest dated context at Yaxuná, although Middle Formative Early Nabanché ceramics have been found in various areas of the site (Stanton 2000, n.d.a; Stanton and Ardren 2005). Ek Complex ceramics have also been documented from the early settlement, in particular with the earliest floors of the E-Group and below a Classic period residential group just south of the E-Group. Nevertheless, their study is as yet inconclusive, and the attributes of these ceramics, primarily defined by their wash surface treatment and burnishing, appear to vary somewhat from materials reported from Komchén and Tzubil. The Ek Complex has been redated to about 1000–800 BC by Andrews and his colleagues (2008; see also Andrews 1983, 1988, 1990; Ceballos Gallareta and Robles Castellanos 2012), who believe it to be the earliest Middle Formative ceramic complex in the northern lowlands.

Throughout the Middle Formative (900–300/250 BC)[2] the community at Yaxuná appears to have maintained long-distance ties to the southern Petén region of the lowlands. The presence from the very beginning of what appears to be an early E-Group, a very southern lowland architectural complex, indicates strong ties to Petén from the time Yaxuná is initially established (Stanton n.d.a; Stanton and Collins n.d.a, n.d.b). Whether this nonlocal architectural tradition at Yaxuná represents the founding of Yaxuná as a center by southern lowland Maya or an attempt by northern lowland Maya, who heavily interacted with the south to create some type of affinity with their southern peers through built environment and ritual practice alike, is unknown and maybe moot. The important facts here are that it is a large E-Group, *a la par* with those in the southern lowlands, and that is it hundreds of kilometers north of the nearest southern lowland E-Groups. So while in the south E-Groups appear to have emerged in a constellation of adjacent early centers (Doyle 2012, 2013a, 2013b), Yaxuná appears to have been a distinct cosmopolitan salient in the north. During this era we also see relatively high numbers of southern lowland ceramic styles (such as Pital Group material), a situation also reflected in the northwestern portion of the peninsula during Early Nabanché times (Ceballos Gallareta and Robles Castellanos 2012). This is the only other region where early E-Groups have been positively identified on the northern plains. These data could indicate that Yaxuná was established early on as a node of a pan-peninsular inland trade route between Petén and the northern salt flats, a route that many centuries later, during the Terminal Classic, would be coveted by the Itzá (Stanton n.d.a).

By the end of the Middle Formative, Yaxuná had grown to the level of a sizable town and the only center of any consequence in north-central Yucatán, an area with little evidence of settled life apart from Yaxuná. A handful of Middle Formative ceramics have been recovered at Ikil, Popolá, and X-Panil, but there is little to indicate that these communities were anything but small hamlets at this time. The Selz Foundation Yaxuná Project discovered an intriguing Olmec and Middle Formative style sculpture of a head at Popolá when first recording the building of the bas-reliefs there (Magnoni et al. 2014b). This sculpture in the round, with puffy eyes, full cheeks, fat lips, and ear flanges, and visible from all sides, is well outside the canons of lowland Maya art known for the area. Such freestanding isolated surface finds are known elsewhere in the northern lowlands. Yet all we can say is that Popolá lies geographically between Yaxuná and the northern coast, a logical trade route as we note above.

By around 400–250 BC major architectural modifications occurred along the principal east-west axis of the site defined by the E-Group. The floor was substantially raised and a large quatrefoil symbol was carved into the center of the plaza (Stanton and Collins n.d.a, n.d.b). This activity is slightly earlier than the construction of two dance platforms in a then-open area to the east (Suhler 1996). Both platforms have a series of internal corridors shaped as quatrefoils, a symbol later associated with the World Turtle and the resurrection of the Maize God, just like the ones depicted on the West Wall of the Pinturas Building at San Bartolo (Saturno 2009; Taube et al. 2010). This mural dates to the first century BC at the latest, and the quatrefoil portal was already a pan-Mesoamerican Middle Formative Ceremonial Complex icon by the middle of the first millennium BC, famously depicted at Chalcatzingo in Morelos. These icons underscore the religiously cosmopolitan nature of Yaxuná and its early role as a ceremonial center.

Significantly, these icons are also associated with the emergence of Middle Formative rulership. We believe that the sacred space of Yaxuná was expanded to incorporate larger groups of people (those with a sedentary lifestyle at Yaxuná and the rural hamlets across the local landscape, as well as those who could have possibly continued a more mobile lifeway). It is probable that (1) as more people adopted maize-based agriculture as a staple source of subsistence at the end of the Middle Formative and the transition to the Late Formative, calendrical rituals associated with the agricultural cycle became increasingly important; and (2) emerging sodalities of leaders used public celebrations and concomitant economic exchange to leverage their positions within the community, guiding their growing constituencies down a path of increased social hierarchy, role differentiation, and institutional complexity that would reach greater heights during the Classic period.

THE DEVELOPMENT OF THE EARLY STATE IN THE LATE AND TERMINAL FORMATIVE

Beginning with William Coe's (1965) landmark article outlining the Formative construction sequence of the North Acropolis at Tikal, archaeologists have been aware of a stage of lowland high civilization preceding the Classic period and segueing into it. A School of American Research seminar reviewed the evidence throughout the lowlands as of the early seventies (Adams 1977). In that decade, discoveries at Cerro Maya (Freidel 1979, 1981), Cuello (Hammond 1980), and Lamanai (Pendergast 1981) in Belize affirmed this reality and demonstrated that Formative civilization existed in much of the lowlands, not just in the interior heartland. Research at Yaxuná itself was in part prompted by the search for more examples of this Formative phase of civilization in the northern lowlands, especially following the discoveries at the Formative center of Komchén by E. Wyllys Andrews V and his team (Andrews et al. 1984). The more specific question of state development during the Late Formative (300/250 BC–AD 1) and Terminal Formative (AD 1–250/300) has been a topic of discussion among Maya archaeologists since the 1970s and was strengthened by work starting in the 1980s in the Mirador Basin that revealed very large and complex communities in this heartland area (e.g., Clark et al. 2000; Dahlin 1984; Hansen et al. 2008). Freidel (1979) challenged the notion of a Core Area and a Periphery in the Maya lowlands posited by William Rathje (1971) as a means of explaining the dynamics of initial innovation and spread of state institutions. He proposed instead, based on the precocious sites in Belize, that polities arose throughout the lowlands through regional interaction of local elites. The discovery that the massive sites of the El Mirador area dated to the Formative period strengthened Rathje's Core Area hypothesis, but ongoing research shows that some Periphery sites, such as Cerro Maya and Yaxuná, were linked to the El Mirador area as strategic economic and political salient cities during the Formative period. The extent of this regional pattern remains to be elucidated, but sites such as El Tigre (Vargas Pacheco 2008) on the Candelaria River in Campeche and Ichkabal in east central Quintana Roo near the Caribbean littoral, and a constellation of small cosmopolitan communities in northwestern Yucatán (Andrews and Robles Castellanos 2004) appear to be promising places to pursue links and routes to the Core Area.

At Yaxuná itself we recognize many trends that are similar to the changes that occurred at southern lowlands sites in the Mirador zone (and elsewhere) during the latter part of the Formative. The town witnessed an increase in population, a tremendous program of monumental construction (specifically triadic acropolis groups), and, following the strong Middle Formative ceramic affiliations with the south, a maintenance and enhancement of such interaction with Chicanel-style ceramics. By the Terminal Formative, sometimes referred to as the Protoclassic (Brady et al. 1998; Pring 1977), a more local ceramic "Flaky Ware" tradition began to dominate the ceramic assemblages of the western and central northern plains, including Yaxuná (Glover and Stanton 2010). The E-Group at Yaxuná continued to be the focal point for public ritual at the site. This complex was expanded with a raised stucco walkway marking its central axis. While we suspect that the Central Acropolis has a Middle Formative substructure, we have few data from the complex other than it reached a height of 21 m by the Late Formative (Stanton 2000). As mentioned, the Central Acropolis was sheathed in finely dressed monolithic blocks, a stylistic signature of Late Middle to Late Formative architecture in the Mirador area at Nakbé and El Mirador (Hansen 1998), including the massive Danta complex.

Richard Hansen (1998) has made an influential case for the triadic design in Formative public acropolises as a type of royal architecture. His arguments draw on analogies from southern lowland Classic period triadic groups with clear expressions of royal performances such as the Group of the Cross at Palenque. Yet he also makes use of iconographic evidence from well-preserved Late Formative complexes such as Group H at Uaxactún (Valdés 1992). Freidel and Schele (1988; see also Freidel et al. 1993) also identified the iconography of Late Formative façades as referencing divine kingship. There are really two distinct triadic arrangements: a triangular one and an in-line series of three building platforms or secondary substructures on top of a long one. The former design resembles the eastern range of E-Groups, but it can occur independently as found at Cerro Maya in the case of Str. 29 (Freidel 1986; Schele and Freidel 1990) and at N10-53 and N9-56 at Lamanai (Pendergast 1981). Hansen references the triangular arrangement's potential cosmic association with the First (Green) Three Stone Place of Maya creation myths as proposed by Freidel and his colleagues (1993) and discussed by Karl Taube (1998). That mythical place is, in turn, associated with apotheosis of the Maize God.

We now know from David Stuart (2014) that the deity referenced in relation to the First Three Stone Place in the Palenque myth is not the Maize God but a creator god named One Tooth Person, whom he identifies as the sun emerging reborn from the eastern sea (Stuart 2010). One of the names of this deity on the Panel of the Cross at Palenque is the rain god Chaak. Stuart cogently hypothesizes that this deity, traditionally called GI, is the sun god who brings the rains that annually return from the east. GI, the watery sun, is strongly related to the religious precepts of divine rulership in the Classic period. While we will have more to say about this deity in our discussion of Early Classic Burial 23 in chapter 7, we agree with the working hypothesis that Triadic Groups relate to Formative period rulership.

Several triadic acropolis groups were built in Yaxuná proper and in the general vicinity of the site during the Late Formative. Both the North Acropolis and East Acropolis were founded at this time; the East Acropolis was established as the locus of ritual performance space on the east-west axis of the E-Group and replaced the dance platforms for their ritual termination. We suspect that the 5E-30 Group was also founded at this time, marking the southern terminus of the Late Formative Sacbé 3 (the North Acropolis serving as the northern terminus), although we lack the deep stratigraphic sequence to confirm this hypothesis. We know for certain only that the group was abandoned at some point during the Terminal Formative (Stanton 2000; Stanton et al. 2010).

Str. 5E-19, with its sizable Middle Formative substructure (Stanton and Ardren 2005), was modified into a Late Formative triadic group as well. Finally, two Late Formative style triadic groups are located off to the north and east of the Yaxuná site center; one of these groups is classified as the site of Tzacauil and is associated with Late Formative occupation (Garza and Kurjack 1980; Hutson et al. 2012a). The identification of these triadic groups is significant as this architectural form was much more popular in the southern lowlands than in the north. We believe that this is indicative of the continuing intimate connection between Yaxuná and Petén, which is also suggested by the continued presence of southern lowland ceramics. Yet the construction of these triadic acropolis groups, by itself, demonstrates Yaxuná's success and growth through the Formative period. Settlement studies indicate that the residential extension of the site reached its maximum during the Late to Terminal Formative (Stanton 2000; Stanton and Magnoni 2009a)—possibly matched, but not eclipsed, during the Terminal Classic. The two eastern triadic groups were integrated to the Yaxuná site core by causeways, which lead back toward the site center, specifically in the direction of the E-Group. We take these data to indicate that Yaxuná was successful in attracting people (possibly from its hinterlands as well as from other established communities farther afield) through its success as a regional ritual, social, and economic hub. We do not see any evidence of a substantial rural population to date. There is perhaps slightly more evidence of a Late and Terminal Formative rural occupation than one during the Middle Formative, but the sample size remains so reduced as to render the trend statistically meaningless.

While we have explicit data concerning rulership during the Early Classic in the form of royal tombs, the question of governance during the Late to Terminal Formative at Yaxuná remains to be seen. Until we have discovered relevant interments dating to the Formative we are challenged to work with the data in hand regarding such an institution. In general, royal interments dating to the Formative are very rare (e.g., Agrinier 1964; A. F. Chase and D. Z. Chase 2011; Krejci and Culbert 1995), an exception being the tombs at Tikal in its North Acropolis (W. Coe 1965). The data in hand (Stanton and Freidel 2005) suggest that some kings acceded in the dance platform complex. While inferential, the scale of the public architecture in the site zone reinforces the view that Yaxuná was a center administered by kings by the advent of the Late Formative period. This view is commensurate with the supposition that Late Formative triadic complexes in major sites like Yaxuná are associated with kingship in the Maya lowlands as discussed above.

A pressing question is the nature of such kingship and its variability in institutional expression in both time and space. Freidel (n.d.) is of the view that Formative lowland Maya kingship was elective in some fashion and not predicated on primogeniture or patrilineal succession. This was generally the case with Classic kingship in the southern Maya lowland polities raising carved stone stelae celebrating the pedigree of rulers. Such a hypothesis suggests that Formative period kings were likely interred in residences rather than in public buildings. The absence of Formative tombs in buildings at Yaxuná is not evidence in favor of such a notion, but the cenotaphic offering in one of the dance platforms (Stanton and Freidel 2005; Suhler 1996) supports this scenario. Moreover, the raising of multiple triadic groups during the Late Formative suggests that rulership had already evolved significantly from the Middle Formative when the Central Acropolis and E-Group appear to have been the singular focus of ritual attention at Yaxuná. Naturally, we can only speculate if the multiplicity represents a council of many kings until we have a better grasp of the stratigraphic construction history of the acropolis groups. Alternatively, we may assume that each king raised his (or her) own triadic group during this Late Formative era of institutionalization to be then maintained by heirs. This kind of succession-based proliferation of ceremonial complexes, temples, or palaces occurs in many ancient and historical kingdoms (e.g., Tenochtitlan, Chan Chan, and Abomey [e.g., Moseley and Day 1982]). In either of these possible scenarios for Early Classic Yaxuná the major change in civic-religious space is a move from a single, visually and physically accessible center to a composite one composed of several places with more restricted access, although connected by processional routes that transformed them into one broader religious space.

THE COMING OF KINGS IN THE EARLY CLASSIC

The transition to the Early Classic (AD 250/300–500) at Yaxuná is complex. Evidence strongly indicates that many monumental buildings were abandoned and left to fall into ruin during the Terminal Formative, although the pace and pattern of this abandonment is unclear given the current dating. By the third or fourth century AD the East Acropolis, Central Acropolis, 5E-30 Group, 5E-19 Group, and the E-Group were left to fall into ruin. We suspect that the two eastern triadic groups were also abandoned around this time; we currently have evidence only from Tzacauil to support this notion. Data from residential areas of the site core suggest a lower population within the site compared to the Terminal Formative, although we are wary to assign hard numbers to estimate populations (Stanton 2000; Stanton and Collins n.d.a). Besides the development of a new peripheral group, Xkanhá, two kilometers to the northwest of the Yaxuná site center (Ardren 1997), there continues to be very little evidence of settlement outside of Yaxuná proper throughout the region.

It is of note that since the 1990s, archaeologists, geologists, and geographers have been investigating the possibility that Late Formative lowland civilization experienced a regional collapse in some way analogous to the famous ninth century AD collapse in the southern lowlands (see Hansen et al. 2002; Gill 2000; Gunn et al. 2002; Hodell et al. 1995, 2005, 2007). What is certain is that the city of El Mirador suffered political collapse and significant cessation of public construction at the end of the Late Formative, probably the second century AD; many, but not all, of the satellite cities in the Mirador zone also experienced political collapse and the cessation of monumental construction. To the north of the Mirador zone, the same thing happened at Yaxnohcah. Cerro Maya also collapsed as a center in this era. The collapse of Yaxuná as a political and religious center at the same time is unsurprising to us given our hypothesis that it was a salient of the Late Formative Mirador state and a vital node on the inland salt route from the northern coast. It is equally unsurprising that the city eventually recovered in the ensuing Early Classic period, as the salt route would have served surviving and reviving communities in the southern lowlands.

When the city center revived at Yaxuná during the Early Classic, we note substantial construction at the North Acropolis, one of the Formative triadic groups. Two of the three major structures on the acropolis were excavated during the 1990s, and both have major Early Classic construction phases and royal tombs (which we will discuss in greater detail in chapter 7). Charles Suhler (1996) encountered Burial 23 right on top of the Formative architecture, indicating that this ruler's mortuary monument represents the first construction activity at the locus during the Early Classic. This stratigraphy suggests that the king and his council refurbished and used the existing Formative pyramid during his lifetime and then claimed it as a place for the community to worship him in death. Surface inspection of the southern pyramid in the acropolis shows that it has a terrace of monolithic blocks across the middle; blocks were likely quarried from the abandoned Central Acropolis façade, and this is some evidence for possible Early Classic refurbishment of this pyramid in the time of the Burial 23 king. Certainly Str. 6F-4 on the east side of the group witnessed Early Classic refurbishment. The tomb in Str. 6F-3 is in a prominent position anchoring the overall north-south axis of the site established in the Late Formative period (Stanton and Freidel 2005). We argue that it represents the revival and transformation of divine kingship in the community. As discussed above we think that divine kingship was already an institution well established at Yaxuná in light of the triadic groups and the posited royal accession dance platforms of the early Late Formative Period (Stanton and Freidel 2005; Suhler 1996). That said, the ruler interred in Burial 23 evinces a remarkable combination of southern lowland style ceramics and some southern lowland style royal regalia, such as a Maize God pectoral in the groin area, and some northern lowland style royal insignia, particularly northern lowland style greenstone *huunal* jewels in the vicinity of his head (Freidel and Suhler 1995). This king's entombment establishes at Yaxuná the hallmark southern lowland practice of placing divine kings in central public buildings. His arrival also marks the resurgence of public construction at Yaxuná following the political collapse of the Late to Terminal Formative center. We think he was likely a foreigner to Yaxuná from the south, but with some traditional ties to northern polities as seen in his royal crown jewels. There are some contextual and iconographic reasons to speculate that he was a lord of Kaanal, the historically prominent kingdom to the south with its Early Classic capital at Dzibanché in Quintana Roo (Martin and Grube 2000; Velásquez García 2004). Research at Yo'okop in Quintana Roo (Shaw and Johnstone 2006a) discovered a glyphic reference to a Kaanal king, Sky Witness, who was responsible for the conquest of Tikal in AD 562 (Martin and Grube 2008). Burial 23 is more than one century earlier than this historical ruler, but Kaanal king K'altuun Hiix was certainly expanding his realm to the south by AD 520, and it is possible that he or his predecessors were interested in reestablishing command of the potentially lucrative overland salt trade to the south in the time of the ruler who was laid to rest in Burial 23.

There is also some evidence from Str. 6E-14 that the Early Classic witnessed, possibly under the ruler in Burial 23, a recentering of the site with the construction of this radial temple. This building really is at the center of the overall Late Formative civic-religious design, including the massive abandoned buildings mentioned above and the masonry causeway from it that leads south toward this center point. The ceramic data and monolithic masonry design of Str. 6E-14, probably made with blocks quarried from the adjacent Central Acropolis, suggest that this building was constructed in the Terminal Formative or early phase of the Early Classic period. Dzibilchaltún to the northwest of Yaxuná has a famous Classic period radial structure that was a tower suitable for accession rituals (Suhler et al. 1998b). It is quite possible that Str. 6E-14 was such an accession building designed to reinitiate the government and power of Yaxuná in the way that the famous Terminal Classic King Wa'tul Abtal of Ceibal did in his radial structure there.

Another area of the site that figures prominently in the Early Classic construction program is the residential area just to the south of the E-Group. Surface collections indicate that several of the large residential platforms to the north of Sacbé 5 have substantial Early Classic occupations. Excavations in the 5E-50 Group, the probable royal palace (Freidel et al. 1998), demonstrate that Str. 5E-52 was first constructed during the Terminal Formative. The only clearly discernible substructure beneath the Early Classic palace was burned, and there were abundant large fragments of ceramics that suggested a termination ritual had taken place (cf. Pagliaro et al. 2003; Stanton et al. 2008). The two radiocarbon samples from this deposit indicate a second or third century AD date for the burning. Again, El Mirador appears to have politically collapsed in the second century AD, and there are Terminal Formative termination ritual deposits on buildings there. Whether the burning of the Yaxuná palace locus was part of the regional social unrest of that era or was an expression of later turbulence as the city suffered its own collapse and halting Early Classic revival is difficult to determine with the data in hand.

In the Early Classic period construction of the North Acropolis, Burial 24 in Str. 6F-4 is no doubt associated with a violent transition in divine kingship at Yaxuná. That deposit is, along with Burial 23, the focus of chapter 7. This multiple interment, buried deep within the platform adjacent to the eastern temple of the North Acropolis, terminates ritually the city's dynastic rule (Ambrosino et al. 2001; Stanton et al. 2010; Suhler et al. 2004). Its chronological range (late Early Classic) falls into Tikal's Manik III construction period, which is substantiated by the Teotihuacanoid ceramics among the offerings. Here again, polychrome vessels and carved jadeites show birds and *sak hunal* greenstones, along with a host of other artifacts and ornaments. The simultaneous multiple context included 12 bodies, including one half-cremated corpse and several seated bodies whom we assume to be the dynastic family. The marks of perimortem violence and fresh wounds that their skeletons display indicate to us that violence must have accompanied the replacement of dynastic power at this time.

THE LATE CLASSIC GREAT ROAD

While the end of the Early Classic at Yaxuná has been a bit of an enigma (Johnstone 2001; Suhler 1996; Suhler et al. 1998a, 1998b), the beginning of the Late Classic (AD 500–700) has been overwhelmingly characterized as the incorporation of Yaxuná into a conquest state emanating out of the metropolis of Cobá (Andrews and Robles 1985; Freidel 1992, 2007; Schele and Freidel 1990; Shaw 1998; Stanton and Freidel 2005; Suhler and Freidel 1998; Suhler et al. 1998a, 1998b; see also Loya González 2008; Loya González and Stanton 2013, 2014). Despite early interpretations of the causeway being used up to Terminal Classic times, ceramic analysis of the terminal deposits on Sacbé 1 by Dave Johnstone (2001; Shaw and Johnstone 2001, 2006b) indicate that the use of this feature as a primary thoroughfare ceased by the end of the Late Classic. Excavations by both Traci Ardren and Lourdes Toscano Hernández revealed that the construction phase of the causeway terminus building (Str. 6E-13) that joined Sacbé 1 likewise dates to the Late Classic, indicating a relatively short use of this feature.

The possibility of assigning the construction of the *sacbé* to the seventh century AD is appealing given what we know about the epigraphy of Cobá. Building off of David Stuart (2010) and Sven Gronemeyer's (2004) separate analyses of identifiable rulers at Cobá, Guenter (2014) has proposed that a woman *kalomte* (queen) from Cobá ruled from about AD 640–681. Lady K'awiil Ajaw was a bellicose queen, and her surviving iconographic corpus depicts her standing over 12 captives. Guenter argues that she either incorporated Yaxuná into a seventh-century conquest state or that Cobá's controlled territories were consolidated under her watch.

In any event, the archaeology at Yaxuná demonstrates that the *sacbé* could have been constructed during her reign or even prior to it, but that it was no longer in use soon after her reign was over, suggesting that Cobá's political reach did not extend to Yaxuná after AD 700. The political achievement of constructing such a long *sacbé* between two centers cannot be overestimated. It must have required the acquiescence and collaboration of all of the communities along the 100 km long route. Given the territorial scale of lowland polities estimated by most archaeologists, this route traversed numerous realms. Freidel (2007; see also Andrews and Robles 1985) agrees with the proposal that it was primarily a military feature designed to project armed force rapidly from Cobá into the north central interior of Yucatán. This would have ameliorated the necessity of maintaining a large garrison at Yaxuná. While it had a functional surfacing it would also have served the purpose of moving traders, ambassadors, and others privileged to walk on it between the communities it encompassed. It would make best sense to us if Lady K'awiil Ajaw, clearly a great ruler of the dominant city in the northeastern peninsula, commissioned the *sacbé*. Guenter (2014) makes a reasonable, if not uncontested, case epigraphically for Lady K'awiil Ajaw as a powerful ruler independent of the Kaanal regime of Yuknoom Ch'een the Great in that she acceded to the throne of Cobá as ruler, an act unrivaled by contemporary queens to the south who were related to him.

Still, it is hard to imagine that these rulers were other than allies, for Yuknoom Ch'een successfully prosecuted war in the southern lowlands throughout his reign and showed no concern for any military adversary on his northern borders, at least if we believe the official records etched in stone. Both Cobá and the Classic Kaanal kingdom of Dzibanché likely had ancient roots, and we suspect they may have been both descendants of the diaspora from Formative Kaanal. Certainly Guenter's analysis of Cobá's rulers shows that they did not practice patrilineal succession there as did dynasties in the southern lowlands. In this political panorama of Kanaal allies, Lady K'awiil Ajaw may have carried out the violent termination of Str. 6F-4's final phase if Teotihuacan-Tikal allies built it and sacrificed the royalty interred in Burial 24. That desecration was left open and abandoned thereafter, perhaps as a memorial to the slain as the tomb chamber was spared and left just under the surface of the ruin, although this possibility remains a hypothesis at the present time.

During the Late Classic, Yaxuná maintained a sizable population. Showing a substantial increase over Early Classic demographic levels (Shaw 1998), we are finally able to perceive a rural population in the region with small hamlets present at several sites including Ikil, Joya, and Popolá. Yet the amount of civic construction at Yaxuná was negligible, nearly as low as when it was reduced to a small Late/Terminal Classic village after the rise of Chichén Itzá (see Toscano Hernández and Ortegón Zapata 2003). One of the few civic buildings identified to the period is Str. 6F-11, a then freestanding structure just to the south of the North Acropolis (Novelo Rincón 2012). This building has an unusual carved monument, that may be a halved stela, with a hieroglyphic text abutting its eastern face. While the majority of the hieroglyphs are eroded, the one legible glyph is *ch'aakba*, an axe glyph. While speculative, there is a possibility that this monument commemorates the incorporation of Yaxuná into an expanding seventh-century Cobá state. In any regard, after more than a millennium and a half of constant renegotiations of the civic plan, the monumental center is practically shut down, and there is no evidence of local rulership (Stanton and Freidel 2005).

Given the continued presence of Petén polychromes at the site, it appears that the inland trade route along which Yaxuná was situated was still open. Loya González and Stanton (2013, 2014) have argued that Cobá established Yaxuná as the western frontier of its kingdom to control passage along that route leading to the northern salt flats, thus giving Cobá access to an important inland trade route in addition to its access to the Caribbean coastal networks through its probable ports of Muyil, Tancah, and Xelhá (cf. Canché Manzanero 1992).

TERMINAL CLASSIC REVITALIZATION

Soon after the death of Lady K'awiil Ajaw, evidence suggests that Sacbé 1 fell into disuse and the political influence from Cobá vanished. Freidel (2007) observed that Villa Rojas's (1934) report on Sacbé 1 described improvised stone barriers across it at various points between Yaxuná and Cobá. He thought that these barriers may have been constructed by the Chan Santa Cruz rebel Maya during the nineteenth-century Caste War (1847–1901). However, Freidel noted that without a prepared surface of gravel and marl, Sacbé 1 would have been difficult to move on quickly, and moreover that the wilderness on the *sacbé* would have made existing nineteenth-century trails much more useful. So he proposed that the barriers should date to the pre-Columbian era—namely, the Terminal Classic period—when a running series of military confrontations along the *sacbé* must have turned the causeway into a moving battle strip. While Freidel thought that the battlefield materialized wars between Chichén

Itzá and Cobá, it is much more likely considering the current data that the obstructed *sacbé* segmented the battlegrounds between Cobá and the Puuc cities of the west.

It is already during the first half of the eighth century AD that architectural styles from the western portion of the peninsula begin to appear at Yaxuná and at a wide number of sites throughout the region. One site in particular, where fine veneer architecture occurs, is Ek' Balam, whose earliest named king, Ukit Kan Lek Tok', acceded to the throne in AD 770. Given that the mural of the 96 glyphs stipulates that this king arrived at the site and the "king of Tlalol was made" (Lacadena 2002), we might suspect that the spread of Puuc styles may have been accompanied by a process of incursions of western Maya coming out of the Puuc into central Yucatan. This interpretation fits very well in Andrews and Robles's (1985) original model of northern lowland sociopolitical dynamics.

At Yaxuná we do not see the clear arrival of a king during the eighth century AD in the form of entombed ancestral shrines. Yet we do witness evidence from Uxmal and a program of architectural construction that revitalizes the civic core of the city, which still during the Late Classic period had been left to fall into ruins (Kowalski 1986, 1987). This could have occurred *a la par* with numerous other sites further south (e.g., Jasaw Chan K'awiil of Tikal), where similar construction programs appear to have been commissioned by powerful rulers. From around AD 700/750–850/900, numerous central buildings at the site were given new façades. The sequence of construction is difficult to understand in many cases, but we securely know that the majority of the major architectural groups (Central Acropolis, East Acropolis, North Acropolis, and the 5E-19 Group) were renovated. The development of new western cultural influences is most patent at Yaxuná in the so-called Puuc Group, which denotes a series of structures immediately to the south and southwest of the North Acropolis. Using a seriation of architectural styles based on his experience working around Kabah, Novelo Rincón (2012) has pieced together the chronology of the complex using his excavation data gleaned from the INAH project. In its final state the complex is a polygonal group very similar to the Early Puuc Ceremonial Complex, or EPCC, defined by Nick Dunning (1992). These are polygonal arrangements of buildings replete with ramps and masonry towers. They are covered with stucco that would have looked like very large stela (May Ciau 2000; see also Smyth et al. 1998; Stanton et al. 2003). These ramps, as well as two towers with as yet unpublished anthropomorphic figures, were also found at this group (see Novelo Rincón 2012). Further, the only known ballcourt at Yaxuná, also dating to this period, is also found just to the southeast of the group (Ardren et al. 1994). The EPCC has been interpreted as an administrative center and is reported throughout the Puuc region (Dunning 1992; Yant 2014); the best-dated example comes from Kiuic where it is placed in the early Late Classic period (AD 650–700) by Yant (2014). To our knowledge, the Yaxuná example of the EPCC is the only one reported outside of the western part of the peninsula. Of note, there is also ample evidence of ritual burning, which includes human remains, at a small platform associated with this group (see chapter 8). This type of material pattern is mainly subscribed to the Puuc area, and in general to the western territories of Late Classic Yucatán (Tiesler 2017a).

Novelo Rincón (2012) demonstrates an accretion of architecture in the Puuc Group, starting with Early Puuc styles and ending in a fine veneer masonry style that he equates with the construction of a *popol na* at Yaxuná, Str. 6F-68. While much of the stone working style at the Puuc Group and 6F-68 looks "Puuc," as Suhler (1996) notes there is a mix of architectural techniques that are local and nonlocal. Supporting this notion, Novelo Rincón argues that a local style of construction was used to support a Puuc aesthetic. Using the presence of an EPCC at Yaxuná as evidence of a form of direct administration from the Puuc region, Novelo Rincón is inclined to support the idea of a local population whose control switched from Cobá to the Puuc kingdoms around AD 700. This convincing archaeological assessment raises the fundamental question: How did the Puuc realms, perhaps a confederacy of kingdoms, align with the powers of the southern lowlands? It is clear that these kingdoms did practice divine kingship, and no doubt they regarded themselves as peers with southern lowland kings. Did they side with dynastic Tikal and the other enemies of Kaanal? In light of what happens to them in their ensuing contest with Chichén Itzá this seems likely, albeit speculative, but the archaeology of "world war" in the Classic lowlands remains an exciting and challenging enigma. We are confident that Yaxuná will eventually reveal valuable information relevant to such larger questions.

CHICHÉN ITZÁ AND THE CLOSE OF THE CLASSIC ERA

Just like a number of other northern lowland centers, Yaxuná was eclipsed as a regional capital by the growing urban power of Chichén Itzá (chapter 9). Hastily erected defensive walls dated to the ninth century AD were raised around the North Acropolis (Ambrosino et al. 2001). Signs of destruction and selected abandonment deposits characterized by a mix of Sotuta and Cehpech ceramic types have also been reported for this period. Specifically, the intentional destruction of Str. 6F-68 was marked by extensive burning and the entry of a crypt placed beneath one of its floors, an event that will be discussed in chapter 9 of this volume. On that occasion, the cranium and most likely the majority of the grave goods were removed.

The arrival of Sotuta ceramics at the site has been interpreted as evidence for an Itzá conquest of Yaxuná (Ambrosino 2007; Ambrosino et al. 2003; Ardren 1999; Suhler and Freidel 1998). The urban core of Yaxuná's expanding neighbor, Chichén Itzá, experienced substantial construction and population growth already by the mid-ninth century AD, and the iconographic program of the site is more replete with war-related motifs than any other Maya site. Chichén Itzá's architectural layout is as vast as it is intimidating. We therefore believe that it is more than likely that Yaxuná was incorporated into the new political order at Chichén Itzá by coercive means. Yet just how Chichén Itzá figures into the larger population history of the Maya lowlands remains undetermined and will be one of the themes explored in chapter 9. Beyond doubt, the rulers of this successful city regarded themselves as the rightful successors to the doomed Classic hegemonies further south (Schele and Mathews 1998). In terms of the contest between Kaanal and its Cholan-speaking dynastic adversaries in the south, it seems likely that the rulers of Chichén Itzá were one more hurrah for the northern proto-Yucatek-speaking Maya recalling the glory of Kaanal. The retaking of Yaxuná would have been just another righting of a historically ancient grievance.

Yet what happened after the sacking of Str. 6F-68? From the detailed archaeological exploration at this building it becomes apparent that this, like many of the civic buildings at the site, was abandoned and left to fall into permanent ruin. In fact, only a small village remained in the site core toward the close of the first millennium AD. Str. 6F-9, a small vaulted building, was constructed off the south side of the North Acropolis. Suhler (1996) interprets this building as an administrative facility used to manage the remaining population at the site. A small number of platforms in the Puuc Group were renovated to be used as domestic structures at this time, and it is likely that the Maya who stayed at the site were farmers who may have produced surplus products to feed the growing urban center of the Itzá (Toscano Hernández and Ortegón Zapata 2003). In fact, surveys conducted by PIPCY have encountered numerous sites with Sotuta ceramics across the study region, and with the exceptions of Ikil, X'togil, and possibly Popolá, all of them appear to have remained populated in the form of small hamlets (Stanton and Magnoni 2013). Yet it is quite likely that Yaxuná, as an ancient crossroads, remained, even in defeat and diminution, a long-known and therefore viable center.

The regional scenario in and around Yaxuná is complemented by work at other Terminal Classic satellite settlements of Chichén Itzá. One of these studies includes the analysis of domestic abandonment processes at the site of Xuenkal, located in the Cupul region corridor to the north of Chichén Itzá, long thought to be controlled by the Itzá to access the port community of Isla Cerritos (Andrews et al. 1989). Here, Vallejo Cáliz (2011) discovered that abandonment was a gradual process in residential areas as Sotuta ceramics appeared at the site. Much like Yaxuná, far fewer people lived at Xuenkal during the apex of Chichén Itzá, and many of those who chose to stay at the site may have been involved in subsistence activities and craft production directly linked to the Itzá economy (e.g., Ardren et al. 2010). Yet regardless of how Xuenkal was brought under Itzá control, this work demonstrates that people moved away from competing regional centers, whose monumental cores were allowed to languish and fall into ruin. Some of these people may have moved to Chichén Itzá itself to take advantage of more opportune living conditions at the booming metropolis, directly linked to the new cult revolving around the Feathered Serpent much in the same way that Teotihuacan began to drain the surrounding regional population in the Basin of Mexico during the Early Classic (see Sanders et al. 1979). Other families may have chosen or been forced to move to rural areas in the region or even farther afield, until finally the leadership structures of competing political centers were completely dismantled and rural areas were reorganized to create a regional hegemony over the local Maya that served the interests of the elite of Chichén Itzá. Elite families and artisans throughout the north relocated to this new urban center (e.g., Vázquez de Ágredos Pascual et al. 2014), as well as many commoners. Yaxuná's remnant population would have witnessed this process firsthand as their community was being transformed into the agricultural backdrop of Chichén Itzá.

By the end of the Terminal Classic, Yaxuná was abandoned as a habitation site altogether. Peto Cream, the primary ceramic group marking the transition from the Classic to the Postclassic (see Andrews et al. 2003; R. Smith 1971), is markedly absent from the site. While Late Postclassic (AD 1100–1521) materials have been documented in domestic contexts of other sites in the region, including Mopila and at least half a dozen small hamlets (Stanton and Magnoni 2013), there has been no indication of permanent settlement at Yaxuná during this period leading up to the European invasion. Yet there was activity occurring at Yaxuná. Several small Late Postclassic altars were constructed throughout the site. Some of these may have been aimed at memory rituals (Ardren 2003, 2015), while others may have been hunting shrines (Götz and Stanton 2013). At least one individual was interred in Str. 6F-3, probably as an offering. In any event, Yaxuná was a place of ruins during the Late Postclassic.

EPILOGUE: THE COLONIAL AND POSTCOLONIAL PERIOD

The Postcontact colonial history of Yaxuná is fragmentary at best (Alexander 2004; Stanton et al. 2010). The region around Yaxunáh (the name of the colonial/modern town on the edge of the archaeological site) was first described by the *encomendero* (a colonist who was granted use of land and native people to work for him) Juan de Magaña in January of AD 1581, although he does not mention the archaeological site per se. Larger surrounding Maya communities, namely Sotuta and Yaxcabá, do resonate amply in the Novohispanic records, commonly identified by the Spaniards as areas of fierce native resistance to Novohispanic rule and, by default, with Maya cultural resilience. As the General Archive of the Indies (Escribanía de Cámara 1009B, in Scholes and Adams 1938) documents, natives of both seats were subjected to cruelty and torture by a number of Spanish religious officials in which the Franciscan Bishop Diego de Landa had an active share. He and his inquisitors obtained hundreds of confessions by interrogating previously tortured "witnesses" of "idol" veneration and secretive "heretic" sacrifices of animals and humans, apparently conducted by heart extraction and crucifixion at that time (Scholes and Adams 1938). Other mentions for this area relate to the sudden drop in local population, decimated by hardship, forced labor, hunger, and deadly contagious diseases. Further, these documents relate information concerning forced relocations of Maya families into *reducciones* (settlements into which the natives were gathered in order to undergo the process of evangelization) at the will of the Spanish Crown, and rebellions that were brutally squashed by well-armed European military.

During the sixteenth and seventeenth centuries AD, the seat of government changed between Yaxcabá (the modern municipal seat) and Sotuta, and for the first half of the seventeenth century, Yaxcabá appears to have had its own parish with secular healers as Franciscans left the area in AD 1586. Yaxunáh itself seems to have been occupied at this point under the administration of Yaxcabá, although control of Yaxunáh appears to have vacillated between Yaxcabá and Sotuta for some time. The church administration did not have much interest in Yaxunáh itself, and we find few mentions of the community in the historic records.

In the eighteenth century Yaxunáh is mentioned in a record of the visit of Fray Luis de Piña y Mazo to the community in AD 1784. Here, Yaxunáh is described as a small town in a zone of ranches and farms. One of these ranches may be the Hacienda Cetelac, established in the eighteenth century AD as a cattle ranch in the southern portion of the ruins of Yaxuná. Andrews and Robles (1985; see Roys 1933) believe that Cetelac was the ancient name of the archaeological site. With time, Yaxunáh appears to have become a more prominent place of settlement. It is mentioned as one of the *haciendas y ranchos del partido* (estate and ranch of the political territory) at the beginning of the century, although exact population estimates for the community cannot be discerned from the documents of the seventeenth century. A few decades later, in February of 1815, a census was conducted that estimated the population of Yaxunáh as follows: "*en el cual habitan 552 indios, y ningún pardo, español o mestizo*" (into which 552 natives live, without the presence of "pardos," Spaniards and mestizos). The population of Yaxunáh appears to have remained completely Maya at that time and increased in the following years to 1,121 inhabitants based on a census conducted in 1821, although in 1828, the population dropped again to 896 people.

It goes beyond saying that Yaxunáh was seriously affected by the Caste War, which started in 1847 as a revolt of native Yucatecan Maya against the well-to-do segment of mostly European descendants, who had long held political and economic control of the region. The census of Yaxunáh from 1846 still reported 620 inhabitants living in the community, before December 28, 1848, when "*el 28 de diciembre (de 1848) desaparecieron, Kancabdzonot, Santa María y Yaxunáh, poblados que fueron asaltados por los insurrectos e incendiados*" (on December 28 (1848) the villages of Kancabdzonot, Santa María, and Yaxunáh disappeared. These villages had been assaulted by the insurgents and set to fire), as historian Baqueiro Preve states. Based on this account, Yaxunáh appears to have been abandoned for a time at the beginning of the insurrection. Indeed, one burial from the archaeological site of Yaxuná seems to date to these times of war and hiding, as we discuss in chapter 9. Namely, Suhler (1996) believes that Burial 10 may be a casualty from the Caste War, indicating that the archaeological ruins were used from time to time during this period of strife. It is revealing that the community is not mentioned in any of the censuses conducted in 1900, 1910, and 1921 and may have remained abandoned during this period. Yaxunáh finally reappears in the census documents in 1930 and today is a town of more than 600 people (Stanton et al. 2010). More recently, this traditional Maya community has been subjected heavily to processes of out-migration, primarily to Mérida and the Caribbean coast, and the local economy is currently on subsistence practices and artisan work.

2

INDIVIDUAL MOVEMENT, MIGRATION, AND POPULATION DYNAMICS IN THE NORTHERN MAYA LOWLANDS

While there is important microvariability across the northern Maya lowlands in terms of geology, vegetation, and climate, this region is united by a relative environmental homogeneity that is important for understanding social dynamics. For example, the lack of surface water across the karstic plains (the highest elevation in the northern lowlands is well below 150 masl) greatly limited methods of transportation. Given the relatively even terrain with its omnipresent low shrub wood forest—Yucatecans call it *monte*—and the lack of large bodies of water, we would posit that the ancient political geography was in many ways dictated by travel distances and social connections rather than by geography and the distribution of natural resources. In contrast to other areas of the world characterized by more resource diversity, the relative homogeneity of the northern Maya lowlands easily lends itself to a focus on the social reasons for the distribution of human settlements. There is not a glaring unevenness in resource distribution that might favor more development of eco-deterministic models of settlement patterns. Here it is easy to see that socially charged criteria of territorial organization were more relevant than anything else in dictating the shifting of settlement patterns, urban agglomerations, and population flows that were experienced by the peninsular Maya through the centuries of their pre-Columbian past.

The goal of this chapter is to explore the mobility of people who died at Yaxuná and beyond by using datasets obtained from their bodily remains. Ancient population dynamics in the northern Maya lowlands have primarily been studied indirectly by comparing styles, artifactual provenience, and more recently, epigraphic inscriptions (e.g., Andrews 1983, 1990; Andrews and Robles 1985). Adding to these types of analyses, we further characterize mobility by combining dental morphology, which is strongly shaped by the individual's genetics, with analyses of oxygen and strontium isotopic ratios; the latter are informative of the residential histories of burial populations through comparison of geological signatures carried in teeth, with baseline data recovered from local and nonlocal regions in Mesoamerica. The use of material culture data in conjunction with the evidence from the remains of the dead themselves gives us a much more nuanced picture of mobility at Yaxuná and throughout the region.

ANCIENT MAYA MOBILITY IN CONTEXT

Like practically almost every other hierarchically organized group worldwide, the ancient Maya were characterized by extensive mobility. Scherer and Wright (2015) report an estimated F_{st} (fixation index) value of 0.019 for the population, which indicates intense genetic flow within the boundaries of the Maya heartland, deep in Petén. Numerous factors can contribute to such high index values, including kinship relationships and necessities at the individual or community level (Manning 2005). The movement of individuals or whole groups of people is basically related to the relationships among persons, objects, time, and space (Beaudry and Parno 2013; Snow 2009). Yet in complex and stratified social systems, such as that of the ancient Maya, human mobility and migrations normally tend to respond to, or are generated by, the state's economic and political spheres of influence; the Classic period Maya city-states established short- and long-distance political and commercial ties with regional secondary centers, as well as allied or subordinate states and other entities (e.g., Martin and Grube 2000; Smith 2004). These relationships would have deeply affected mobility patterns throughout the region but would not have been the only means of facilitating mobility by any stretch of the imagination.

Since the breakthroughs in epigraphic decipherment in the last quarter of the twentieth century (e.g., Martin and Grube 2000; Schele and Freidel 1990; Schele and Mathews 1998) many of the reconstructions of Classic period political relationships have rested on analyses of extant texts. In the northern Maya lowlands such analyses are severely hampered by the quantity, preservation, and content of known texts (Loya González and Stanton 2013, 2014). In reality, few, if any intersite relationships can be gleaned from the current epigraphic data in the north. Therefore, reconstructions of political relationships have relied on material data, specifically the distribution of architectural and ceramic styles (e.g., Andrews and Robles 1985; Freidel 1992; Schele and Freidel 1990). In particular, the focus on the distribution of ceramic styles has led to a greater emphasis on the role of economic systems, such as market economies, that could define regional systems in which people could have more easily moved around. These types of material approaches to political/economic interaction are common in archaeology (Greene 1986; Smith 2004). They are often assessed through the presence of nonlocal goods (e.g., Jiménez Álvarez 2015; Rouse 1986) or locally produced material culture using nonlocal styles (e.g., Braswell 2003), situations that are clearly present at Yaxuná throughout the entire site sequence. In fact, there is plentiful evidence for trade and exchange at this site during the Classic period, the focus of this study. Given that it is often thought that trade and exchange can be a primary factor in facilitating biological interaction between groups (e.g., individuals or whole groups move around the territories in response to trade and exchange), we might expect to find significant evidence of mobility at this site.

Yet, while it is doubtless that economic relationships create the conditions for biological contact, we must take care to assume that they are the primary factors shaping peoples' interactions. The neoclassical (push-pull) approach to human migration, similar to the functionalist theory, addresses this process as the product of positive forces pulling individuals to the final place of destination, while negative forces tend to push the migrant away from the place of origin (Arango 2000; Cameron 2013). The push-pull model interprets population movement and migration as the product of economic factors and therefore identifies the source of movement in the economic disparity between the place of origin and that of final destination (Arango 2000). Yet this model and all the other theories and models of human migration are heavily influenced by our knowledge of modern-day movements of people and their relationships to recent economic expansion, mostly during the twentieth century. We know very well, however, that ancient Maya economies were very different from our modern capitalist context (e.g., King 2015; McAnany 2010); they were entangled within a political, social, and cosmological frame. It was a very complex, multifaceted relationship, which was not driven exclusively by the forces of supply and demand (Masson and Freidel 2002; McAnany 2010:3). This realization in and of itself should give us caution to assume that more evidence of trade and economic interaction equates with higher rates of biological contact and migrations. There is plentiful literature in archaeology that indicate that the patterns of distribution or redistribution of material goods (and ideas) do not necessarily involve human movement (Adams et al. 1978; Stanton and Gallareta Negrón 2001), defined here as the permanent displacement of people. In fact the exchange of ideas and material goods may lead to no population movement (cf. Ball 1983). Often it is other factors unrelated to trade and exchange that can result in individuals' movement. With that said, we turn to a discussion of indicators of population movements and biological interaction.

BIOARCHAEOLOGICAL APPROACHES TO POPULATION MOVEMENTS AND BIOLOGICAL INTERACTION

From the biological perspective, bioarchaeological studies permit researchers to assess population movement through the analysis of the human skeletal remains unearthed in archaeological contexts, studying those very actors who potentially contributed to the migratory processes that shaped past societies' demic structure. Direct and indirect approaches have been extensively used to assess such past movements. Direct indicators include, among others, trace elements (see Cucina et al. 2011b) and $^{87}Sr/^{86}Sr$ ratios. In particular the latter has been successfully used to detect the presence of foreign individuals since the last decades of the twentieth century (Montgomery 2010; Price et al. 2002; Slovak and Paytan 2011). Lately, oxygen isotope ($\delta^{18}O$) analysis has paired strontium in the reconstruction of residential mobility. Although, contrary to strontium ratios, whose interpretation is more straightforward, the use of oxygen isotopes had been initially hampered by the difficulty in tracking all the sources of potential variability (e.g., height, humidity, and rainfall levels, among others), they have now become one of the standard isotopic elements to be included in these kinds of studies (Price et al. 2012; Wright 2012; Wright et al. 2010). Further, Price and his colleagues (2012) have also successfully applied C and N isotopic analyses, which are commonly used to reconstruct dietary patterns, to target residential mobility. We do note however, that Price and colleagues' study focused on a multiethnic colonial cemetery in which individuals of European, African, and Maya origin had been buried all together. The drastic dietary variation among these populations justified the use of dietary indicators, in particular C_3 (Old World) and C_4 (New World) plants, as supplementary evidence to sort out individuals; it is not a situation that we would likely encounter in pre-Columbian contexts.

Despite the growing use of isotopic analyses to understand past human mobility, there are other techniques at our disposal that rest on evolutionary theory. Evolutionary theory states that population movement can be inferred from the extent of intergroup biological affinity, which increases in human groups that are more often in contact with one another as a consequence of reciprocal gene flow (Relethford 2012). Inversely, isolation by distance models indicates that groups that have been "separated" for a long time tend to become more divergent from one another due to different gene flows or independent processes of genetic drift. Thus, from a biological perspective, skeletal indicators such as dental morphology and morphometry have been extensively used worldwide to reconstruct patterns of affinity among ancient and modern human groups (see Scott and Irish 2013 for recent publications).

An additional goal of this chapter is to explore the population dynamics at Yaxuná itself through the combined lens of population affinity from dental morphology and residential mobility by means of $^{87}Sr/^{86}Sr$ and $\delta^{18}O$ analysis (Price et al. 2017), in relation to archaeological information in the form of foreign ceramics and architecture. Such an approach had been rarely used in bioarchaeological contexts (Cox 2009). With the few exceptions of the combined use of dental morphology and morphometry (Aubry 2009; Wrobel 2004), and a parallel analysis of strontium isotopes and dental morphometry in the skeletal collection from Tikal (Scherer and Wright 2015), only recently have these two different indicators of population movement in the Maya region been applied together by Cucina and colleagues (2015) for the Classic Maya context from Noh Bec in the southern cone of the modern state of Yucatán, and by Price and his colleagues (Price et al. 2017) for Yaxuná. In fact, as mentioned in the introduction, isotopic data presented in this chapter have been extrapolated from the latter publication and combined with other markers of provenience and mobility.

DENTAL MORPHOLOGY AND REGIONAL INTERACTION

The skeletal collection from the site of Yaxuná includes 41 individuals recovered by the Selz Foundation and PIPCY projects. For the purposes of this study, the dental remains, initially stored in the Yucatán office of the Instituto Nacional de Antropología e Historia (INAH) in Mérida, were temporarily relocated and curated at the Laboratory of Bioarchaeology and Histology of the School of Anthropological Sciences of the Universidad Autónoma de

Yucatán (UADY), also in Mérida. Dental morphological traits were scored personally by one of the authors (A. C.) on all permanent teeth available following the standardized Arizona State University Dental Anthropology System (ASUDAS). This system consists of a set of reference plaques, which illustrate the range of variability of the majority of dental traits. Most traits have a continuous or quasi-continuous expression; the system transforms this expression in cardinal, sequential categories (Turner et al. 1991). The number of categories depends on the extent of variability of each trait. A few of the traits, nonetheless, are represented in a dichotomous fashion (present or absent) without further categorizations. Our initial data collection scored all the possible traits from all the permanent teeth, which resulted in a total of 79 variables recorded. It must be noted that this number of variables (79) is the result of the fact that the same trait is scored on more than one tooth; for example, the number of cusps in the mandibular molars is scored three times—in the first, second, and third molars. Scoring followed the tooth count method (Scott and Turner 1997), which allowed us to maximize sample size. This approach combines recording every possible trait from both the left and right teeth (when present) in each individual. Then, for any further statistical analysis, the tooth among the antimeres that shows the highest degree of expression is selected. Scott and Turner (1997) consider that the highest degree is representative of the genetic potential of expression of the trait.

Despite the use of a standardized system such as the ASUDAS, the observer's subjectivity in assigning one grade or another still affects the recording of the degree of expression of traits. This is particularly true for all those traits that are continuous in nature. Therefore, with the goal of limiting the margin of error that can be potentially introduced by assigning the degree of expression, the standardized system recommends that all the traits are dichotomized into present or absent, by establishing a specific breaking point for each trait (Scott and Turner 1997). All those values below that specific point are considered as absent, whereas those values equal to or above the breaking point are considered as present. For example, the shovel shape of the maxillary central incisor is represented by seven degrees of expression; zero represents the absence of the lateral edges (no shovel) and grade "6" is the most extreme form of the shovel. In between these two extremes is a whole range of expressions (recorded as grades 1 to 5) (see figure 2.1a). The breaking point to separate "absence" from "presence" is usually established at 3, meaning that for all teeth graded 3 and above, the trait is considered as present, while all those scored zero to 2 are absent. The benefits of establishing a breaking point are twofold. First, because many traits have a continuous range of expression, their assignation along that continuum is somewhat subjective; a score of one degree versus another is essentially arbitrary despite the standardized plaques. Second, a dichotomization allows the application of statistical methods, such as the Mean Measure of Divergence (MMD), which is commonly used in this kind of analysis (see Irish 2010 for a discussion on the frequent use of this method in dental anthropology). It must be stressed that while this approach simplifies the handling of multiple datasets, it also reduces the real extent of morphological variability within and between populations. Therefore, in this study some of the traits whose degrees are clearly described in a qualitative fashion were not dichotomized into

FIGURE 2.1. (a) Maxillary central incisors showing no shovel shape (left) and grade 5 shovel shape (right); (b) mandibular first molar. The circle highlights the presence of the so-called seventh cusp (photo by A. Cucina).

the simple present versus absent categories. Rather, these traits were reorganized according to intermediate degrees of expression, thus granting a more detailed appreciation of the variability among the samples.

Of the initial 79 traits scored, some 55 were excluded due to the lack of variability among sites (e.g., the Carabelli's cusp, which manifests in the maxillary first molar and is practically always absent in the maxillary second and third molars) or because they are known to be correlated with others (such as, for example, the shovel shape of the maxillary lateral incisor, which is correlated to the shovel shape of the maxillary central incisor). This left 24 traits to be used for further analyses. Given that some of the traits were not organized based on a simple dichotomization but were arranged into more than two groups, the 24 selected traits generated a total of 36 variables (table 2.1).

This set of 36 variables was put through an initial data exploratory analysis by means of a varimax-rotated Principal Component Analysis (PCA). The exploratory analysis permitted the identification of 14 variables that presented factor loadings that were equal to or higher than |0.7| in any of the components extracted from the PCA elaboration. These variables are marked with an asterisk in table 2.1, and their percent frequencies are reported in table 2.2.

Given that Burial 23 and Burial 24 are very peculiar (B23 is the dynast and B24 is the mass grave—a more detailed description of these contexts is provided in chapter 6)—and both belong to the Yaxuná II Complex (all the others dated to Yaxuná III or later), the sample

TABLE 2.1. List of the 36 variables initially selected for statistical analyses. Asterisks (*) indicate the traits eventually used for the final elaborations.

MAXILLARY	MANDIBULAR
I1 Shovel Shape 3-4	C DAR 1+
*I1 Shovel Shape 5+	P4 Cusp Number 3+
I1 Double Shovel 2-3	*M1 Anterior Fovea 1+
*I1 Double Shovel 4-6	M1 Deflecting Wrinkle 3
I2 Interruption Groove	M1 5 Cusps
I1 Tuberculum Dentale 0-1	*M1 6 Cusps
I1 Tuberculum Dentale 5-6	M1 Trigonid Crest
*P3 Extra Cusp	*M1 Protostylid 3+
M1 Cusp 5 1+	*M1 Cusp 6 3
M1 Carabelli 3-5	M1 Cusp 6 4-5
M1 Carabelli 6-7	*M1 Cusp 7 1+
*M2 Hypocone 3.5-4	*M2 Groove Pattern Y
M2 Hypocone 5	M2 4 Cusps
*M2 Two Roots	M2 5 Cusps
M2 Three Roots	M2 6 Cusps
M2 Enamel Extension 2-3	M2 Cusp 5 2-3
*M3 Metacone 0-2	*M2 Cusp 5 4-5
M3 Metacone 5	*M2 One Root

was initially divided into two subsamples (phase II v. phase III+). However, and as table 2.3 shows, no noticeable differences could be detected that may suggest the existence of different patterns of morphological traits potentially linked to genetic drift (table 2.3).[1] This lack of differences could also be due to the small sample size that, as previously mentioned, leads us to be cautious with the following interpretations. Nevertheless, these results are noteworthy.

The absolute values do not highlight any particular pattern, neither between nor within groups. The only "anomalous" feature worth noting is the manifestation of a grade 2 seventh cusp in the mandibular first molar of the dynastic occupant from Burial 23 (Yaxuná II; figure 2.1b). Cusp 7 is a trait that Scott and Turner (1997) describe as typical of the sub-Saharan African continent. Although present when large collections are scrutinized, this is a rare trait among the northern lowland pre-Hispanic Maya, in particular during the Classic period. Whereas Cucina and his colleagues (2015) report frequencies around 10% in Classic period populations from the southern lowlands and Belize (see also Wrobel 2004 for Belizean groups), values are much lower in the northern area of the peninsula. The fact that the single seventh cusp encountered in dental collection from Yaxuná comes from the dynast laid to rest in Burial 23, whose geographic and family origin is likely from outside the northern

TABLE 2.2. Frequency of the fourteen variables used in the final statistical analyses, with the respective ranges of breaking points. Asterisk (*) indicates maxillary teeth; double asterisk (**) indicates mandibular teeth.

	*I1 SHOVEL 5+	I1 DOUBLE SHOVEL 4–6	P3 EXTRA CUSP	M3 META CONE 0–2	M2 HYPO 3.5–4	M2 TWO ROOTS	**M1 ANT FOVEA 1+	M2 GROOVE PATT Y	M1 6 CUSPS	M1 PROTOS T 3+	M2 C5 4–5	M1, C6 3	M1, C7 1+	M2 ONE ROOT
ATR-SEI Cla	0.000	0.316	0.188	0.030	0.709	0.195	0.923	0.074	0.302	0.222	0.737	0.188	0.125	0.156
Yaxuná	0.050	0.625	0.059	0.000	0.526	0.400	1.000	0.000	0.500	0.333	0.455	0.125	0.063	0.273
Early Xcambó	0.042	0.364	0.333	0.059	0.345	0.455	1.000	0.105	0.318	0.115	0.538	0.143	0.000	0.188
Late Xcambó	0.030	0.242	0.165	0.138	0.310	0.261	0.905	0.153	0.273	0.144	0.473	0.367	0.025	0.234
Noh Bec	0.095	0.118	0.083	0.154	0.667	0.200	1.000	0.118	0.278	0.222	0.000	0.000	0.000	0.143
Calakmul	0.120	0.455	0.320	0.063	0.625	0.077	0.920	0.067	0.360	0.192	0.526	0.222	0.069	0.077
Dzibanché	0.105	0.500	0.211	0.067	0.533	0.100	1.000	0.048	0.519	0.250	0.313	0.286	0.143	0.273
Jaina	0.059	0.167	0.037	0.000	0.300	0.167	0.788	0.083	0.188	0.074	0.679	0.167	0.014	0.111
Kohunlich	0.143	0.125	0.111	0.000	0.607	0.300	1.000	0.172	0.222	0.333	0.250	0.167	0.033	0.278
Puuc	0.000	0.429	0.000	0.000	0.750	0.333	1.000	0.000	0.750	0.214	0.167	0.556	0.000	0.333
Chichén	0.000	0.368	0.200	0.000	0.571	0.182	0.968	0.053	0.394	0.088	0.333	0.077	0.118	0.250
Early Petén	0.143	0.250	0.231	0.125	0.667	0.167	0.857	0.111	0.474	0.174	0.800	0.222	0.000	0.182
Late Petén	0.150	0.367	0.125	0.000	0.708	0.107	0.829	0.068	0.289	0.085	0.714	0.364	0.000	0.189
Terminal Petén	0.324	0.429	0.111	0.263	0.571	0.095	0.846	0.056	0.424	0.098	0.350	0.071	0.024	0.167
North Chichén	0.071	0.615	0.154	0.000	0.647	0.615	0.938	0.053	0.211	0.211	0.611	0.000	0.100	0.400

TABLE 2.3. Absolute values of degrees of expression at Yaxuná between the individuals belonging to Phase II and the individuals from Phases III–IV.

	PHASE II		PHASE III–IV	
	PRESENT	TOTAL	PRESENT	TOTAL
I1 Shovel Grade 5+	0	8	1	12
I1 Double Shovel Grade 4–6	3	5	7	11
P3 Extra Cusp	1	7	0	10
M3 Metacone Grade 0–2	0	8	0	10
M2 Hypocone Grade 3.5–4	5	10	5	9
M2 Two Roots	3	7	1	3
M1 Anterior Fovea Grade 1+	7	7	7	7
M2 Groove Pattern Y	0	9	0	6
M1 6 Cusps	4	9	4	7
M1 Protostylid 3+	2	8	3	7
M2 Cusp 5 Grade 4–5	4	8	1	3
M1 Cusp 6 Grade 3	0	4	1	4
M1 Cusp 7 Grade 1+	1	9	0	7
M2 One Root	2	7	1	4

region, can be thought of as a potentially further indication of elite family ties to the Petén region during the Early Classic period, as discussed in chapter 1. While we are aware that one single trait expressed in one individual is not representative of the overall regional variation, in a more individual perspective, the presence of this trait does strengthen the argument that the ruler from Burial 23 might have a shared ancestry with Petén populations in the south.

Chronologically, the similarity between the Classic period phases prompts us to handle the dental collection as a single group, also for the sake of sample size. Several multivariate statistical analyses were performed on this new series of 14 variables and compared to the dental morphology of Yaxuná with 14 roughly coeval samples from the Maya lowlands (table 2.2). Specifically, they are (in alphabetical order): Calakmul, Classic ATR-SEI (obtained grouping the individuals from Altar de Sacrificios and Ceibal belonging to the Classic period), Chichén (from the Las Monjas and El Caracol structures at Chichén Itzá), Dzibanché, Jaina, Kohunlich, Noh Bec, North Chichén (Isla Cerrito and Xuenkal), Petén (Early, Late, and Terminal Classic), Puuc, and Xcambó (Early and Late Classic). Since every statistical method groups samples based on its own algorithm, the final outcome can be the product of the algorithm itself and may not necessarily represent real similarities or differences between samples; instead, when a particular pattern of similarity or difference between samples results from more than one method, it is very likely that it actually mirrors real morphological affinities (Coppa et al. 1998, 2007; Cucina et al. 2015).

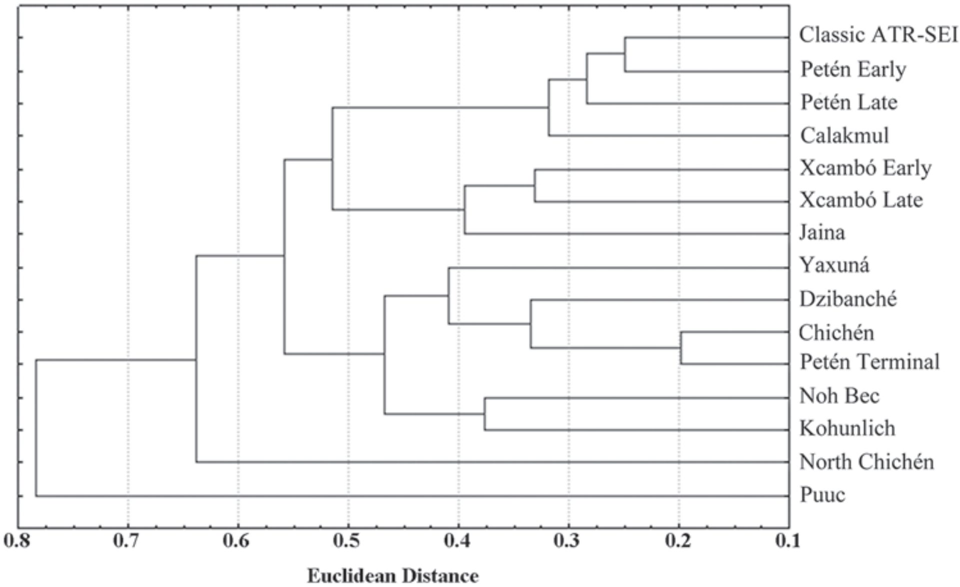


FIGURE 2.2. Cluster Analysis using UPGMA grouping method.

For this volume, we processed the dental collection statistically by using two different cluster analyses (CA), using respectively the UPGMA and the Ward's grouping methods, a varimax-rotated PCA, and Maximum Likelihood with nodes tested using the bootstrap method. Further, given that each of the 14 variables selected represents independent traits, they can be considered as dichotomized into present/absent using particular breaking points; therefore a Freeman-Tukey-corrected Mean Measure of Divergence (MMD) could also be calculated. In this case, the MMD was elaborated on twelve variables, since two of them (the maxillary P3 extra cusp and the mandibular first molar's cusp 6, grade 3) did not present at least five cases to permit their inclusion in the elaboration.

Figure 2.2 shows the clustering obtained using the grouping method of UPGMA (Unweighted Pair Groups Method with Arithmetic Mean). Leaving the Puuc and the group from North Chichén aside, each of which constitutes one distinct branch, two major clusters appear, both subsequently branching out into smaller groupings. The first major cluster groups Yaxuná with Dzibanché, Chichén and Terminal Petén, and Noh Bec and Kohunlich. The coastal sites in the northern peninsula (Jaina and Xcambó) do not form part of this cluster. Similar results can be appreciated when the Ward's grouping method is applied (figure 2.3). In this case, all the samples branch into two major groups. In this statistical approach, Yaxuná continues to pair with Dzibanché, Chichén, and Terminal Petén, and with Noh Bec and Kohunlich in the UPGMA grouping.

The first two factors obtained from the varimax-rotated Principal Components Analysis (figure 2.4) explain the 25.15% and 15.19% of the total variance, respectively. In the scatterplot obtained from the first two dimensions, Yaxuná is located along the positive axis of the

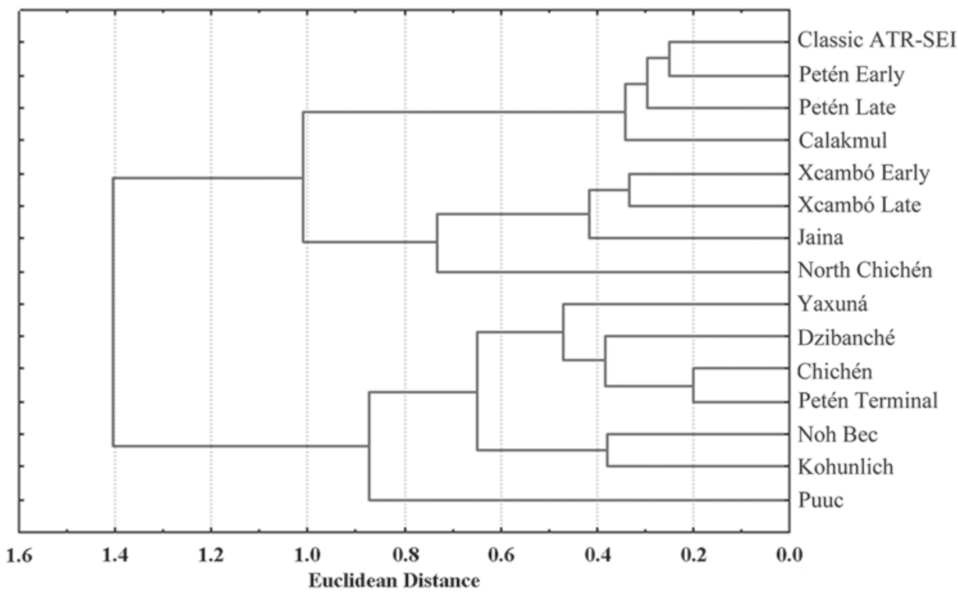


FIGURE 2.3. Cluster Analysis using Ward's grouping method.

first component together with Chichén, Puuc, Dzibanché, Noh Bec, and Kohunlich. This distribution is due (mainly though not only) to higher frequencies of the mandibular M1 Anterior Fovea and mandibular M1 Protostylid grade 3+, and to lower frequencies of the mandibular M2 Cusp 5 grades 4–5. In terms of the second component, Yaxuná occupies the highest positive position together with North Chichén, a condition mainly due to higher frequencies of the maxillary I1 Double Shovel grades 4–6 and lower frequencies of the mandibular M2 Groove Pattern Y.

The Maximum Likelihood, whose nodes have been tested using the bootstrap method (figure 2.5), places Yaxuná within a cluster that appears in only 18% of the iterations, together with Dzibanché, Puuc, and North Chichén. Within this cluster, the node with the sample from North Chichén appears 51% of the time. Chichén is the following sample separating from this cluster. The distance is noticeable between Yaxuná and both the peninsula's northern coastal sites (Jaina and Xcambó), as well as the groups from the central lowlands. Finally, the MMD (table 2.4) shows that Yaxuná manifests stronger similarities with the inland samples from the northern lowlands, and also with Early Xcambó. Yet Jaina and Late Xcambó, once again, seem to diverge from Yaxuná; the same pattern is also manifest among the central and southern lowlands sites.

In terms of intrapopulation variability from dental morphological traits, a skeletal collection reaches the highest level of heterogeneity when the frequency of each trait is 0.5 (50%) (Cucina 2016). By multiplying 2 * p * q (where p = frequency of presence of a single trait and q = frequency of absence of that trait) for each trait, and calculating the mathematical average among the selected traits, a numerical result is obtained that indicates the extent

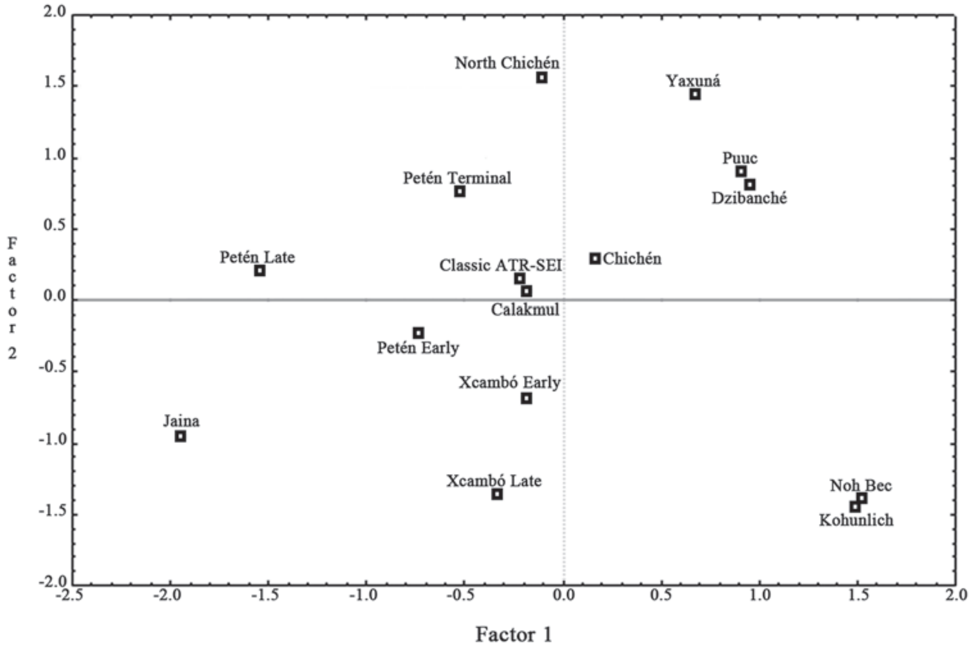


FIGURE 2.4. Principal Component Analysis, factors 1 and 2, varimax-rotated.

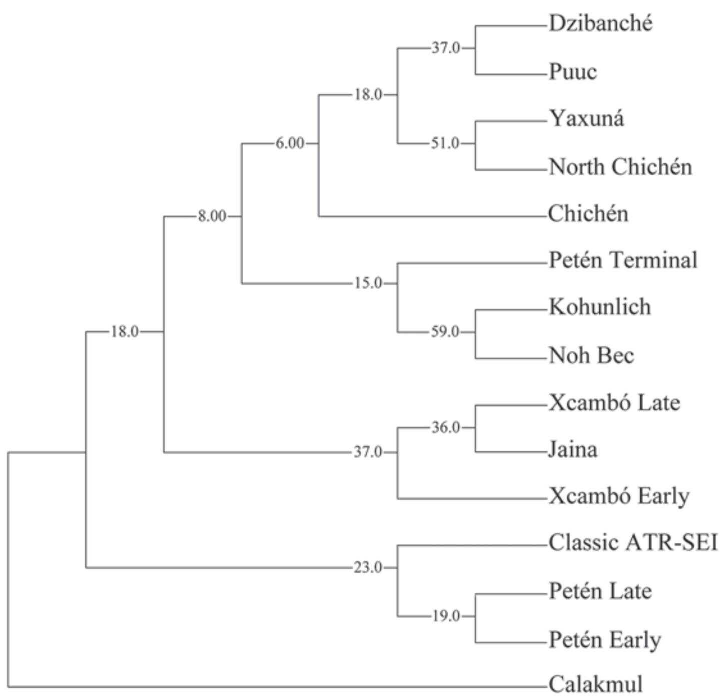


FIGURE 2.5. Maximum Likelihood, unrooted tree. Values indicate the number of times the node appeared out of bootstrap's 100 iterations.

TABLE 2.4. Mean Measure of Divergence matrix. Upper right triangle shows the MMD values, lower left triangle shows the standard deviations of each MMD.

	ATR-SEI CLA	YAXUNÁ	EARLY XCAMBÓ	LATE XCAMBÓ	NOH BEC	CALAKMUL	DZIBANCHÉ	JAINA	KOHUNLICH	PUUC	CHICHÉN	EARLY PETÉN	LATE PETÉN	TERMINAL PETÉN	NORTH CHICHÉN
ATR-SEI Cla	**0**	0.0542	0.0688	0.0882	0.23	-0.0033	0.0716	0.0634	0.1164	0.0989	0.0039	-0.0028	0.0447	0.1711	0.0556
Yaxuná	0.0387	**0**	-0.0031	0.1042	0.173	0.0114	-0.0474	0.1512	0.074	-0.0895	-0.0247	0.0659	0.1113	0.1328	-0.0463
Early Xcambó	0.0313	0.0483	**0**	-0.0153	0.1094	0.0322	0.0465	0.0169	0.0432	0.0275	0.0014	0.006	0.0837	0.1062	0.016
Late Xcambó	0.015	0.0321	0.0246	**0**	0.1056	0.048	0.0826	0.0097	0.0749	0.1153	0.028	0.0236	0.1108	0.0994	0.1162
Noh Bec	0.0414	0.058	0.0506	0.0346	**0**	0.1019	0.0712	0.2231	-0.0132	0.0279	0.0673	0.1636	0.2376	0.0916	0.2585
Calakmul	0.0307	0.048	0.0403	0.0242	0.05	**0**	-0.0325	0.0392	0.0719	0.0377	-0.0206	-0.049	-0.008	-0.0124	0.0668
Dzibanché	0.0345	0.0517	0.0439	0.0281	0.0536	0.0442	**0**	0.1673	0.0555	-0.0558	-0.0444	0.0527	0.1219	0.0319	0.0709
Jaina	0.0349	0.0514	0.0434	0.0292	0.053	0.0448	0.0488	**0**	0.1117	0.2131	0.0554	0.0001	0.0113	0.1284	0.1296
Kohunlich	0.0297	0.0465	0.0391	0.0228	0.0492	0.0386	0.0423	0.0421	**0**	0.0482	0.0309	0.0944	0.1351	0.1578	0.0951
Puuc	0.0585	0.0753	0.0677	0.0519	0.0774	0.0677	0.0717	0.0714	0.0661	**0**	-0.0543	0.0636	0.1244	0.0986	0.0511
Chichén	0.0338	0.0507	0.0432	0.0273	0.0529	0.0433	0.0472	0.0479	0.0416	0.0708	**0**	0.0482	0.0589	0.0871	0.0313
Early Petén	0.0457	0.0626	0.0549	0.0394	0.0648	0.0553	0.0593	0.0597	0.0535	0.0826	0.0584	**0**	-0.0437	-0.0041	0.0633
Late Petén	0.0235	0.0404	0.0329	0.0168	0.0429	0.0325	0.0364	0.0366	0.0313	0.0603	0.0355	0.0478	**0**	0.0794	0.1
Terminal Petén	0.0255	0.0425	0.035	0.0189	0.045	0.0347	0.0385	0.0387	0.0334	0.0622	0.0377	0.05	0.0274	**0**	0.1785
North Chichén	0.0367	0.0535	0.0462	0.0304	0.0555	0.046	0.0497	0.0493	0.0444	0.0733	0.049	0.0611	0.0387	0.0409	**0**

of morphological heterogeneity within the sample. Resting on a comparative series of 40 traits, previously calculated for eleven dental collections from the Maya area (Cucina 2016), Yaxuná averages 0.276, whereas the comparative samples range between 0.245 and 0.350. Note that, quite unsurprisingly, the highest values recorded among the skeletal collection belong to skeletal populations from large cities (such as Ceibal, for example) and to those excavated at coastal trading hubs (such as Xcambó or Cozumel). Both urban centers and trading posts are likely to have experienced intense migratory processes with their corresponding increase in population variability. Conversely, lower values have been interpreted as the result of increased endogamy (or closed population with low levels of genetic influx). In this biological panorama, the value calculated for Yaxuná classifies the site as one of the lowest in phenotypical dental variety. Based on the comparative samples, such low value at Yaxuná seems to represent a population that was biologically enclosed, with little aperture to biological exchanges with external families coming from afar.

STRONTIUM AND OXYGEN ISOTOPES

As a complement to the dental morphological analysis, strontium ($^{87}Sr/^{86}Sr$) and δ oxygen ratios ($\delta^{18}O$) of teeth were analyzed. All strontium and oxygen isotopic analyses were conducted by T. Douglas Price and James E. Burton of the University of Wisconsin in Madison, and the data employed in this chapter have been taken from Price and his colleagues (2017). More than collective trends on affinities and mobility, these isotopic signatures inform us about residential histories of 32 individuals who died and were buried at Yaxuná. Since teeth do not remodel once they have formed, they tend to signal the geological conditions during the time of their growth. Thus, the values give away information about the local or foreign status of an individual, and in the latter case, the profiles of potential areas of residence during the early years of life.

For this study, the enamel of first permanent molars was sampled and sent in for isotopic analyses whenever available. The enamel of these multicusped teeth develops during the first three years of life and therefore expresses the geology of the place of residence during early infancy. In this chapter, we will use the data to complement the collective trends highlighted by the dental morphology of Yaxuná and to put the living experiences of Yaxuná's inhabitants, detailed in the subsequent chapters, into perspective with their residential histories.

The analytical procedure for both $^{87}Sr/^{86}Sr$ and $\delta^{18}O$ required abrasion of the external surface of the cusps of every tooth using a Dremel "Moto-tool" fitted with sander bands (Price et al. 2017). The cusps were then cut from the tooth using a crosscut blade, and any remaining dentine was removed with a drill. When a clean cusp was not available, a small chip of enamel was removed from the side of the tooth after abrading the surface. Five milligrams of enamel were then reduced to powder with a drill for subsequent analysis.

The exact procedures of processing the obtained samples for oxygen and strontium isotopes is described in detail elsewhere (Price et al. 2014), so we will provide only a brief synopsis here. Regarding $^{87}Sr/^{86}Sr$, enamel samples were dissolved in 5M HNO_3, purified, and eluted HNO_3 followed by H_2O. Isotopic compositions of strontium were obtained using a thermal ionization mass spectrometer, and corrected for fractionation using an exponential mass fractionation law. Strontium blanks were insignificant in relation to the amounts of Sr in the samples.

Oxygen $\delta^{18}O$ corresponds to the ratio between $^{18}O/^{16}O$ of the sample over the standard ratio calculated as $[\delta^{18}O = (^{18}O/^{16}O_{sample}/^{18}O/^{16}O_{standard} - 1) \times 1000]$ (per mil). Oxygen isotopes from powdered samples of tooth enamel carbonate were measured using a gas-ratio mass spectrometer. Samples were reacted with dehydrated phosphoric acid, and ratio measurements were calibrated based on measurements of NBS-19 and NBS-18 standards.

The values of $^{87}Sr/^{86}Sr$ in the Yucatán Peninsula, regardless of whether measured in flora and fauna or in rocks and soils, are determined primarily by the isotope ratio that characterizes the strontium-rich limestone bedrock. Figure 2.6 shows the variability of $^{87}Sr/^{86}Sr$ values in the Maya region (Price et al. 2008). This ratio is directly related to the isotopic value of seawater at the time the limestone was deposited. Previous geological coverage has already provided a fairly extensive record of the seawater ratios through time (see, for example, Howarth and McArthur 1997). This information, which has been verified by studies of rocks, soils, and water by Hodell and his colleagues (2004) and by studies of faunal and human remains from throughout Mesoamerica (Price et al. 2008; see also Schaaf et al. 2012), allows us to make inferences on the expected $^{87}Sr/^{86}Sr$ in humans from knowledge of the bedrock geology. With the exception of the Maya Mountains of Belize, whose $^{87}Sr/^{86}Sr$ values are above 0.712, the highest values can be found along the northern shores of the Yucatán Peninsula ($^{87}Sr/^{86}Sr$ = 0.7089–0.7090). Values in inland regions in the northern Maya lowlands drop from 0.7088 in the northernmost part of the peninsula to below 0.708 in the southern Maya lowlands; the lowest values can be found toward the Pacific coast, where $^{87}Sr/^{86}Sr$ ratios can be as low as 0.7041. The region immediately surrounding Yaxuná is characterized, on average, by $^{87}Sr/^{86}Sr$ values around 0.7082–0.7084. The analysis of archaeological or modern faunal remains of species with a restricted radius of movement (for example, terrestrial snails or small mammals), and which share(d) the same habitat with the ancient human settlers, is indicative of the "biologically available" strontium that one would expect to record in individuals who were born at the site (Price et al. 2008, 2017; Wright 2005a, 2005b, 2012).

While strontium ratios are relatively stable in specific areas and provide homogeneous signatures through time due to their relationship to geological formations, oxygen isotopes respond to a different set of factors (humidity, temperature, and altitude) resulting in increased variability in time and space (Budd et al. 2004). The isotopic composition of oxygen in the body is controlled by drinking water (Budd et al. 2004; Kennedy et al. 2011), and both environmental and biological processes fractionate the isotopic composition. Water evaporating from the seas and oceans gathers in the atmosphere in the form of clouds. When clouds touch land, the first rains to fall are enriched in ^{18}O. The more the clouds move inland, the more fractionation occurs, leading to a "lighter" (less ^{18}O-enriched) rain at high elevations in comparison with coastal areas, what Rozanski and his colleagues (1993) call

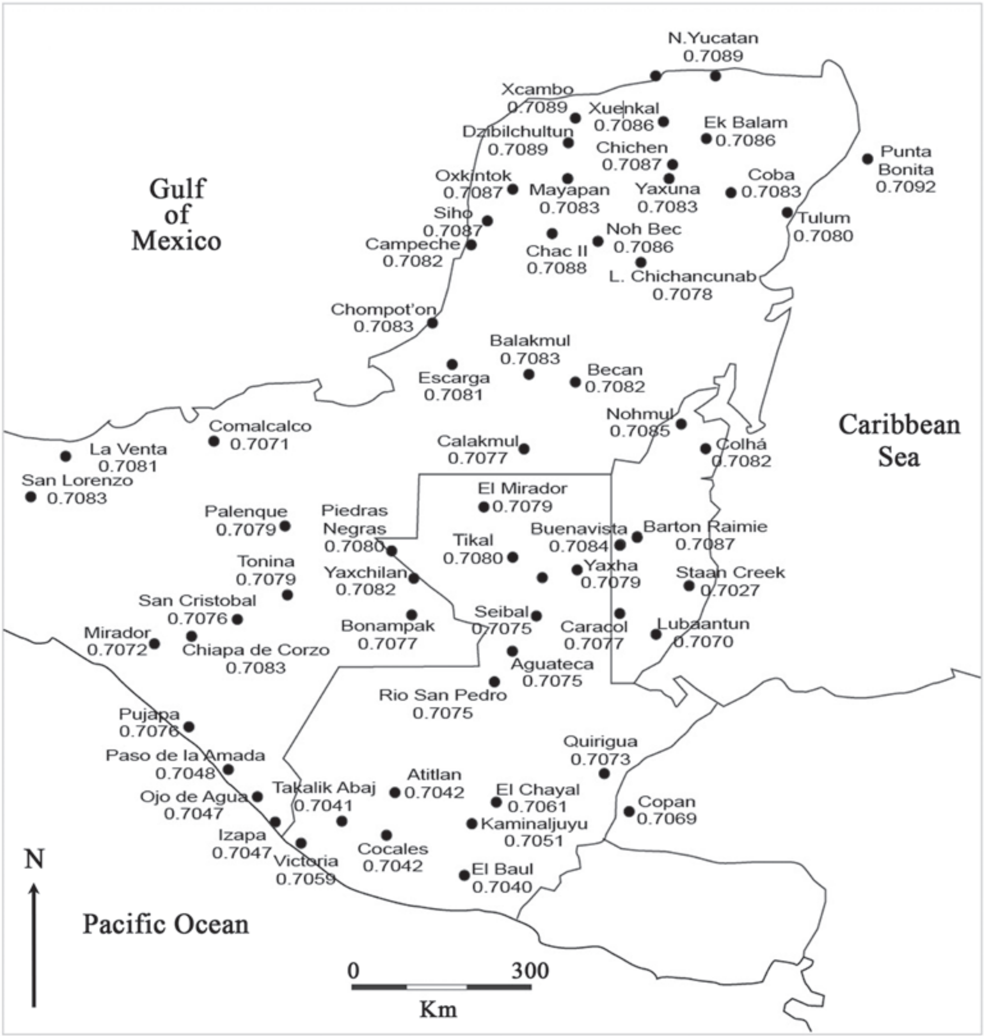


FIGURE 2.6. Variability of $^{87}Sr/^{86}Sr$ baseline values in the Maya area (adapted from Price et al. 2008).

the "continental effect" (see also Wright et al. 2010). Further, drinking water from water reservoirs may present a $\delta^{18}O$ that depends on the size of the reservoir itself and the rate of evaporation and rainfall (Wright et al. 2010). Finally, body temperature affects fractionation; however, individuals from the same species living in the same area manifest similar oxygen isotopic composition since isotopic fractionation is species-specific (Longinelli 1984).

One other factor that is important to consider is the type of biological material utilized. Studies of blood-water levels of $\delta^{18}O$ in rats indicate that they stabilize in about one week after the introduction of foods and liquids with a different isotopic composition (Longinelli 1984). Diachronic changes in archaeological individuals during their lifetimes, however, cannot be appreciated in detail because bones are subject to constant turnover, which on average takes about ten years to completely replace the existing bony tissue with new bone.[2] This situation contrasts with that of teeth. As with $^{87}Sr/^{86}Sr$ isotopes, oxygen from the carbonate (CO_3) component of enamel hydroxyapatite remains unaltered once the tooth has completed its formation, making teeth ideal for this type of analysis. Wright and Schwarcz (1998) have noted that $\delta^{18}O$ changed between teeth forming at different times, while manifesting similar values among those that form in the same period of an individual's life. The authors interpreted the enriched $\delta^{18}O$ values in teeth forming during the early years of life as the product of maternal breast milk in the diet until about age two. Breast milk is, in fact, enriched in $\delta^{18}O$ as the result of a process of biopurification of maternal body water during breastfeeding, which eliminates more easily the lighter oxygen isotope (^{16}O), proportionally increasing the amount of the heavier isotope (^{18}O) in the body. In any event, the use of dental enamel has proved useful for understanding how $\delta^{18}O$ levels can inform us of ancient movements of people in the past.

In the Maya area, $\delta^{18}O$ values vary greatly depending on the geography and climate (Price et al. 2008, 2014, 2017; Scherer et al. 2015). The use of $\delta^{18}O$ in tandem with $^{87}Sr/^{86}Sr$ ratios has proved valuable for providing clarity concerning movements of peoples. For example, the northern coast of Yucatán, represented by the database from Xcambó (Sierra Sosa et al. 2014a), presents $\delta^{18}O$ values between −3‰ to −4‰. At this site, one individual, whose $\delta^{18}O$ value of −2.39‰ is the heaviest among those measured for oxygen isotopes, also presents an $^{87}Sr/^{86}Sr$ ratio significantly lower than the local signature, clearly indicating the individual's nonlocal origin.[3] Table 2.5 displays the $^{87}Sr/^{86}Sr$ ratios and $\delta^{18}O$ values for the Yaxuná sample by chronological phases; this division represents the shift from an independent kingdom to one likely controlled by external polities. Figure 2.7 shows the $^{87}Sr/^{86}Sr$ ratios for the 32 specimens analyzed. The individuals represented by the light gray bars are likely the local ones. Three individuals marked by dark gray bars are slightly below or above the local signature. They are very close to the local values, but they will be discussed separately in the light of their $\delta^{18}O$ values. Finally, the black bars indicate the nonlocal individuals.

The earliest of the burials is Burial 23, the royal male who represents the first clear evidence of divine kingship at the site. As mentioned in chapter 1 and explained in greater detail in chapter 6, contextual and iconographic evidence suggest that this ruler might have originated in southern Quintana Roo, more specifically in the city of Dzibanché. The dental morphology of this individual suggests that he had biological ties to the southern lowlands. Interestingly, Price and Burton (2007) report $^{87}Sr/^{86}Sr$ ratios for southern Quintana Roo as being characterized by a plateau between 0.7083 and 0.7086, a range in which Burial 23 could fit comfortably. No information is known for the $\delta^{18}O$ values in this area to attempt to confirm this origin. In any case, the confluence of isotope, dental morphological, and material evidence suggests that this person is foreign and likely originated in southern Quintana Roo.

The other Early Classic burial, Burial 24, tells a different story. This interment, already described briefly in chapter 1 and more in detail in chapter 6, is a mass grave of twelve

TABLE 2.5. List of $^{87}Sr/^{86}Sr$ and $\delta^{18}O$ isotopic ratios from Yaxuná (from Price et al. 2017).

PHASE II			PHASE III–IV		
BURIAL	$^{87}SR/^{86}SR$	$\delta^{18}O$	BURIAL	$^{87}SR/^{86}SR$	$\delta^{18}O$
23	0.7085	-1.16	1	0.7083	-2.01
24-1	0.7083	-1.66	4	0.7083	-2.04
24-2	0.7088	-2.89	5	0.7082	-2.65
24-3	0.7087	-2.82	6	0.7086	-0.21
24-4	0.7085	-0.76	7	0.7083	-2.47
24-5	0.7086	-2.88	9	0.7084	-3.08
24-6	0.7084	-2.57	11	0.7081	-3.61
24-7	0.7082	-1.75	12	0.7082	-2.62
24-11	0.7082	-1.97	13 a	0.7082	-2.64
24-13	0.7084	-2.80	13 b	0.7087	-2.25
24-14	0.7082	-0.65	14	0.7082	-2.57
			15 a	0.7084	-2.28
			15 b	0.7084	-2.38
			15 d	0.7084	-2.42
			16	0.7088	-2.33
			18 a	0.7083	-1.72
			19	0.7081	-2.18
			20	0.7077	-2.91
			21	0.7089	-2.71
			27-1	0.7082	-2.80
			27-2	0.7076	-0.27

individuals deposited in a vaulted chamber inside Str. 6F-4 on the North Acropolis (Freidel et al. 2003; Suhler 1996; Suhler and Freidel 1998). This multiple interment has been interpreted as a desecratory termination deposit that resulted from a violent change in political affiliation, perhaps perpetrated by local factions working in league with outside forces including the rulers of Oxkintok (Ambrosino et al. 2003; Freidel 2007; Suhler 1996; Suhler and Freidel 1998). The Selz Foundation project argued that this context represents the murder of the royal family of Yaxuná (Ambrosino et al. 2003:115), and the events behind it likely contributed to a striking restructuring of political relationships at the site. Strontium and oxygen isotopes reveal some interesting patterns. First, they demonstrate that the king (B24-1) and more than half of those found in the mass grave were of local origin; if they were not from Yaxuná itself, they were from the local region. In figure 2.7 we can see how the individuals at Yaxuná pattern when their strontium and oxygen isotopic values are plotted together. As is apparent, a main cluster of individuals can be appreciated in the center of

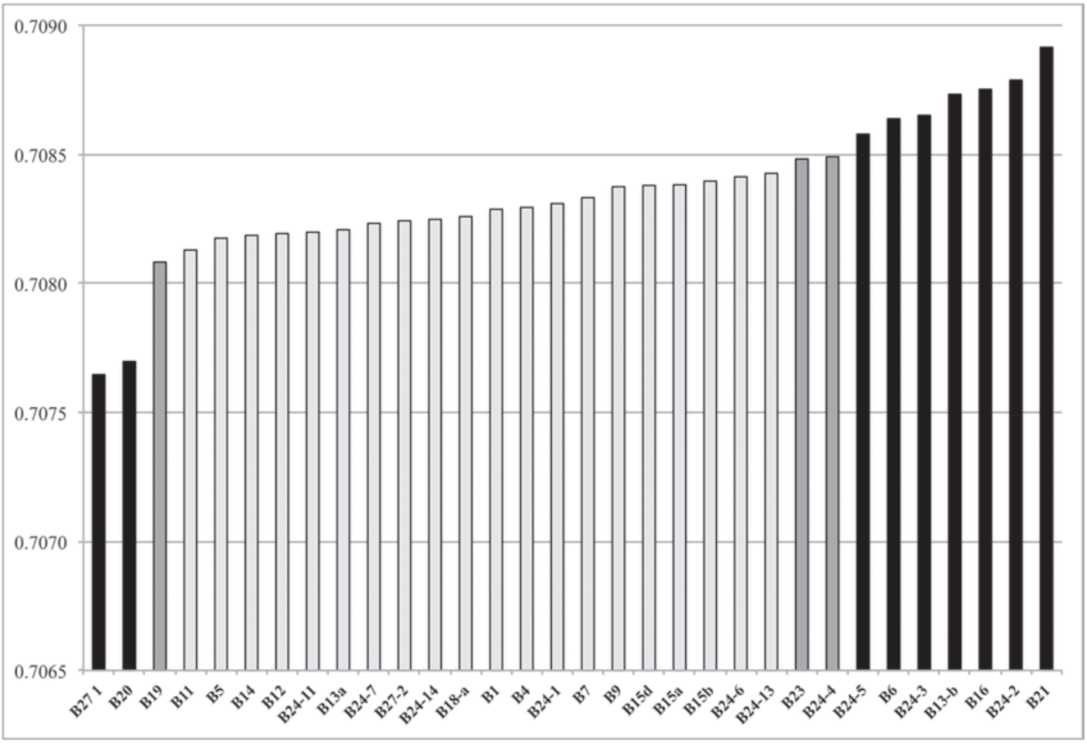


FIGURE 2.7. Graphic distribution of the range of variability of $^{87}Sr/^{86}Sr$ ratios at Yaxuná (data from Price et al. 2017). The light gray bars indicate likely locals. Those marked by darker gray bars are slightly both below and above the local signature, potentially indicating people from the region; the black bars indicate likely nonlocal individuals.

the plot, characterized by a $^{87}Sr/^{86}Sr$ ratio between 0.7082 and 0.7084, and $\delta^{18}O$ between −1.5‰ and −3‰. This cluster likely represents individuals of local origin and includes what the graph shows as burials B24-1, B24-6, B24-7, B24-11, and B24-13. The results also indicate that burials B24-2, B24-3, and B24-5 form part of a second cluster on the right of the main one. The strontium isotope values seem to indicate that these individuals originated slightly to the north of Yaxuná. While the strontium values more likely reflect areas in the northern part of the peninsula, all the way to the coastal fringes of Yucatán with B21 representing the extreme end of this group, the oxygen values seem to be too heavy to have derived from the coastal fringes, where Sierra Sosa and her colleagues (2014a) report a $\delta^{18}O$ between −3‰ and −4‰. At the present time we are unable to explain this pattern given the unknown origin of the oxygen values. For the time being, we believe that the Sr values indicate a more northern origin, but to which region of the northern lowlands we are not sure. Regardless, the presence of a second cluster (formed by B24-2, B24-3, B24-5, B13B, B16, and B21), in which half of whose individuals are from Burial 24, is suggestive of a long-term pattern of migration from this area to Yaxuná. This situation may be indicative of an alliance between

Yaxuná and this area, thus explaining the presence of three foreign individuals among the royal family in Burial 24.

An alternative explanation for these three individuals, however, can be given if we take into account the isotopic evidence from three other burials, which have members from this cluster. Two of these three other burials are not typical of standard mortuary practice at the site. Burial 21 is a special deposit at the outlying acropolis of Xkanhá and appears to be an offering rather than a burial (cf. Becker 1992). Burial 13B is a severed head, including four cervical vertebrae, that has been interpreted as a trophy head (Stanton n.d.c). While Burial 16 appears to be a relatively standard multiple burial in a domestic context, the remains were very poorly preserved, and it is difficult to understand the context. In sum, two of the other three burials could be interpreted as individuals who were brought to Yaxuná by force and killed; the third burial is ambiguous. These data may indicate that the three individuals from this cluster in Burial 24 may have also been "added" to the funerary context for reasons having little or nothing to do with their relationship to the royal family. Given the changing nature of regional Maya politics (see Martin and Grube 2000), both options must be considered.

Like burials 6 and 23, Burial 24-4 also presents $^{87}Sr/^{86}Sr$ ratios slightly above the local ones but a $\delta^{18}O$ value highly enriched in the heavier isotope. Resting on $^{87}Sr/^{86}Sr$ ratios, these three individuals could have come from other areas of the northern lowlands (to the north of the modern highway connecting Escarcega on the Gulf Coast to Chetumal on the Caribbean coast) including the southern part of Quintana Roo (sites such as Kohunlich and Dzibanché). Considering the high oxygen values, Petén might be another possibility (Price et al. 2014). In fact, although Wright (2012) reported the presence of individuals with a $^{87}Sr/^{86}Sr$ ratio close to 0.7085 at Tikal, local signature from small fauna suggests a range between 0.7078 and 0.7081 for the region.

Finally, Burial 27-2 separates completely from the rest of the collection. This female individual, represented only by a heavily modified skull deposited in a collapsed cave near Str. 6F-4 (Stanton and Marengo Camacho 2014), manifests the lowest $^{87}Sr/^{86}Sr$ ratio (0.707646); this value indicated that this individual cannot have originated in the northern lowlands, but rather she can be integrated in the Calakmul region (0.7077) or other parts of the southern lowlands, including the eastern sectors of Tabasco. The highly enriched $\delta^{18}O$ value suggests a region with either intense humidity or intense evaporation from water reservoirs. Such an enriched $\delta^{18}O$ value is even more than the highest reported by Wright (2012) at Tikal. A detailed map of $\delta^{18}O$ values for the northern lowlands is still missing, making it difficult to detect potential sources of enriched $\delta^{18}O$ in the region. Yet given the type of cranial modification, it appears that this woman was not local to the northern lowlands.

Figure 2.8 shows the bidimensional plot of the combined evidence of $^{87}Sr/^{86}Sr$ (horizontal axis) and $\delta^{18}O$ (vertical axis) for the 32 individuals from Yaxuná. Here the cluster of locals comprises individuals from both Classic period phases. These oxygen data indicate that no major climate change should have occurred between Yaxuná II and Yaxuná III–IV, provided of course that the local sources of drinkable water did not change during the two periods, a situation that is highly unlikely; on the contrary, the major periods of climate

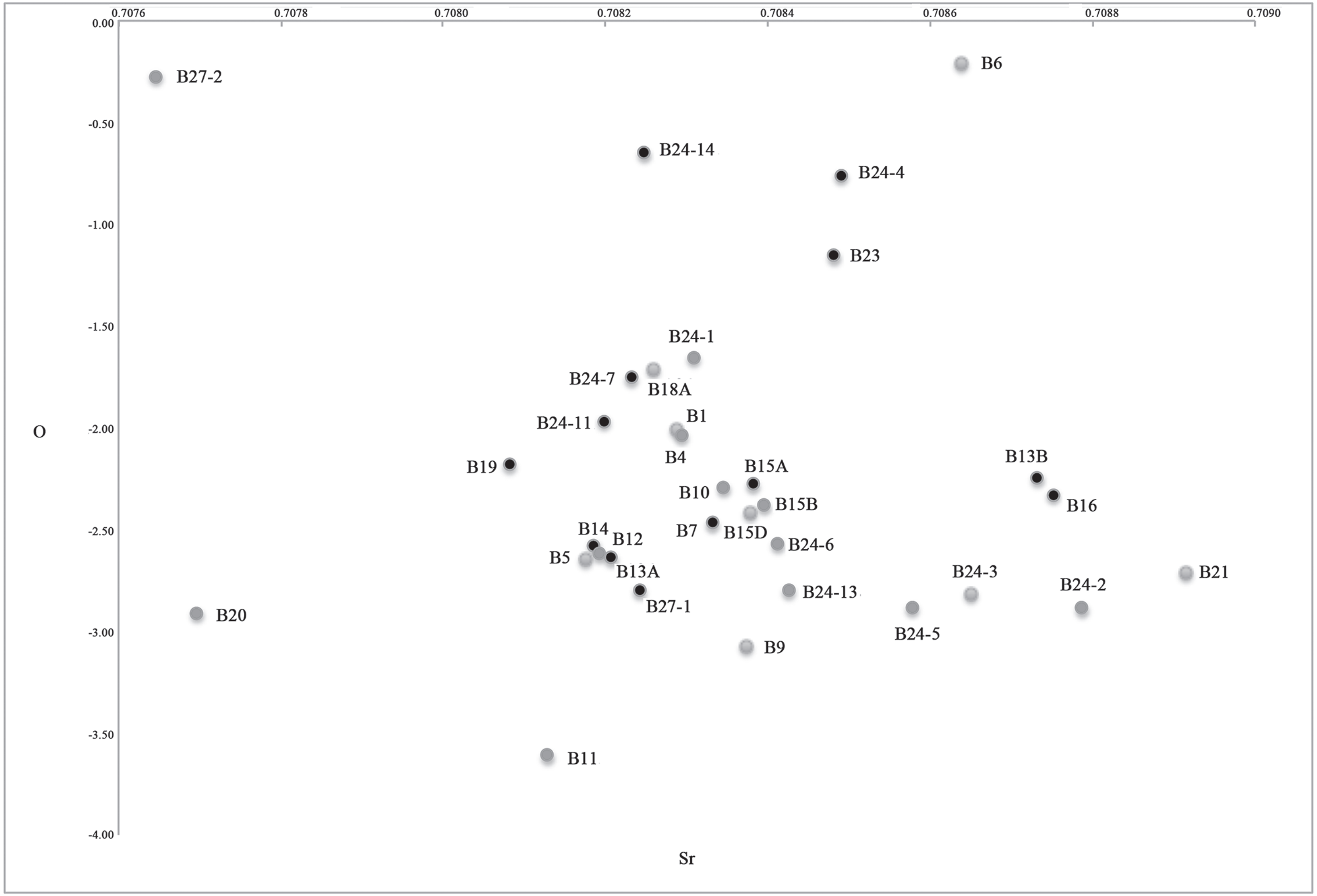


FIGURE 2.8. Sr and O isotopic values at Yaxuná. The black dots indicate males, gray dots females, and white dots unsexed individuals.

change, specifically droughts, would have occurred at the end of Yaxuná Ic and the transition between Yaxuná IVb and Yaxuná V. Given the importance of local climate variability, we should note that there is no major visible change among the oxygen isotope ranges during the time between these two proposed drought events.

DISCUSSION

Interaction and mobility among the ancient Maya was as complex as it was multidimensional, as is showcased by the burial population from Yaxuná. As Braswell (2003) notes, mobility does not simply denote active core movements toward and from a passive periphery, but rather complex and entangled interactions among participants moving in a multidirectional fashion (see also Demarest and Foias 1993; Schortman and Urban 1994). Such entangled processes of exchange networks, which must have included residence changes and migration among the Maya themselves, are mirrored by the patterns obtained from the analysis of dental morphology (see also Cucina 2015; Cucina et al. 2015; Price et al. 2017), just as it is by material culture and genetic data (Andrews and Robles 1985; Scherer and Wright 2015).

Beyond population dynamics, in this chapter we have showcased core aspects of ancient Maya population affinities and residence by combining phenotypical trends obtained from dental morphology with analyses of oxygen and strontium isotopic ratios. Although the former is population-specific (i.e., its analysis focuses on samples rather than individuals and rests on evolutionary theory), and the latter are individual-specific (by providing specific information on the residential histories of each person), their combined use opens windows that shed light on the overall extent and direction of movement and migration in extant populations.

Recently, isotopic and morphometric indicators of population movement have also been applied successfully to understand mobility in Classic period Yucatecan series. Combined scrutiny of the burial population from Kohunlich, Quintana Roo, and Noh Bec from the southern tip of the modern state of Yucatán (Cucina et al. 2015) have highlighted the northward direction of migration flows during the Late and Terminal Classic period. As regards one other study concerning the coastal inhabitants from Xcambó on the north coast of Yucatán (Sierra Sosa et al. 2014a, 2014b), a sharp increase in mobility and most probably settler networks was noted toward the onset of the Late Classic period, long before the merchant allies of Chichén Itzá had established their trade routes. Our present results concerning the inhabitants of Yaxuná indicate that groups tend to reorganize based on the specific statistical algorithm (see also Price et al. 2017). This, per se, indicates frequent movement of people within the Maya sphere of Mesoamerica with apparently no clear (morphological) boundaries (Aubrey 2009; Scherer 2007; Wrobel 2004).

Taking this into consideration, dental morphological traits do present patterns that appear to repeat themselves, either by affinity or diversity, between Yaxuná and other collections. It is on these patterns that we focus our attention, keeping in mind that material data from the site suggest that it occupied an important position along an inland trade network between the northern and southern lowlands. While clear boundaries may not have existed in the past, the patterns do show certain tendencies in terms of higher or lower biological interaction with specific areas. It is noteworthy to remember that Yaxuná's geographical position played a key role in the inland trade network between the northern and the southern lowlands. It does not come as a surprise, in fact, that the end of Yaxuná was the result of the battle for the commercial control over the Yucatán Peninsula, given the site's crucial location (Ambrosino et al. 2003).

In this same perspective, the relative lack of Sotuta ceramics at Yaxuná suggests that it is more likely that Chichén Itzá took over and destroyed Yaxuná instead of conquering and turning it into one of its satellite centers, replacing it as center for trade and political control; only a small hamlet remained after the rise of the Itzá capital.

Beginning with the clearest affinities, the dental morphological data from Yaxuná show strong connections with Dzibanché on one side and with Chichén Itzá on the other. In some analyses the groups of North Chichén, Puuc, and Terminal Classic Petén join the clusters. As discussed in chapter 1, Yaxuná is much entangled in relationships with (or dominance from) various regions in the Maya lowlands through time. The presence of an E-Group and several triadic acropolis groups, as well as higher frequencies of Petén-looking ceramics than other early sites in the northern lowlands, indicate an important period of interaction with Petén during the Formative period (Stanton n.d.a). It is unclear whether these data reflect the establishment of Yaxuná as a center by people migrating from the southern lowlands or the adoption of Petén-style practices by northern lowland Maya involved in extensive commercial relationships with their southern neighbors (see Andrews 1990; Stanton 2000; Stanton and Ardren 2005). Unfortunately, we cannot count on human remains from Formative period Yaxuná to help clarify this situation. The dental morphological data indicate that Yaxuná's population must have sustained a rather extensive biological contact with Petén late in its settlement history. While pre-Hispanic migrations between northern Yucatán and Petén have been documented as late as the Postclassic (e.g., Rice 2009, although these late migrations occurred in a very different, postcollapse, cultural context), material evidence for Petén influence at Yaxuná extends from the Formative through the Late Classic, when the causeway between Yaxuná and Cobá was constructed. In the end, the Petén connection makes sense given the material link between Yaxuná and this area to the south, although the timing of the contact is puzzling. One way to explain the pattern would be to argue that the Terminal Classic Petén dental morphological pattern was caused by Maya from the northern lowlands moving into this southern area and that southern traits were not moving north. Thus, Petén has a more northern influence at this time rather than the north having a more southern influence. This interpretation may find support in arguments suggesting that some southern lowland sites have iconographic, architectural, and ceramic influence from the northern lowlands during the Terminal Classic period (e.g., Chase and Chase 1982; Graham 1973; Kowalski 1989). In any event, there is not an early Petén connection in the dental data, which might indicate that the southern lowland connection is not so much Petén per se but some other area(s) of the southern lowlands where E-Groups and triadic acropolis groups are commonplace. Another possible scenario would be that the Petén connection with Yaxuná did not result in any direct biological interaction. While this latter explanation is conceivable, we believe that it is most likely that the material data used to link Yaxuná to Petén are to be found in other areas of the southern lowlands close to Petén, rather than Petén itself.

One credible possibility for an area that could explain the "Petén" influence at Yaxuná is Dzibanché, located in southern Quintana Roo. Dzibanché consistently correlates with Yaxuná in the clusters, and there are other reasons to believe that these two centers had close ties during certain moments in their histories. We will discuss these reasons in more depth in chapter 6, but material data and the strontium isotopic data suggest that the king buried in Burial 23 was from the Dzibanché region. The choice of using the term "Petén" to explain the southern lowland influence at Yaxuná from the Formative to the Late Classic was made due to the high frequency of elements such as E-Groups, triadic acropolis groups, and polychrome pottery first reported in Petén (e.g., Ruppert 1940; Ricketson and Ricketson 1937; R. Smith 1955) but not exclusive to it. In fact, many of these same elements are found in southern Quintana Roo (and elsewhere), and it is possible that there was a long-term biological connection between these two areas. It is also possible that the "southern" influences at Yaxuná come from multiple areas and may have shifted over time. Yet the dental morphological data indicate that there was not so much biological contact with the Petén area itself, but with the region around Dzibanché, leading us to suggest that (1) the event that led to the installation of a foreign king (B23) from the Dzibanché region may have been part of a much longer and sustained process of contact between these two areas; and (2) the biological contact extended to the general population of Yaxuná and was not just restricted to the elite.

Two other areas that we might expect to show strong evidence of biological contact are the Cobá region and the Puuc Hills. Unfortunately, we still do not have access to comparatively large collections from the Cobá region due to poor preservation. Therefore, we cannot properly assess the impact that the construction of the causeway during Yaxuná III might have had on the population at Yaxuná. Based on archaeological evidence, Shaw and Johnstone (2006a, 2006b) suggest that the material culture from Calakmul encountered at Cobá might reflect some sort of alliance between the two cities. In fact, while the other analyses do not indicate affinity between Yaxuná and Calakmul, the MMD analysis shows a close affinity between these two cities—a situation that might make sense given the link between Calakmul and Dzibanché (Martin and Grube 2000). However, the ties between Yaxuná and Cobá (represented by the 100 km long *sacbé*) are dated to approximately one century (AD 600–700), which is a relatively short period of time to reflect real similarities in the dental morphology. Further, according to Domínguez Carrasco and Folan (2015), Calakmul's trading operated in a stepwise fashion. Thus, the presence of material culture from Calakmul in the northern Maya lowlands may not be indicative of direct contact (see also Cucina et al. 2015).

Regardless of the difficulties in understanding the biological interaction among Calakmul, Cobá, and Yaxuná, we do have a sizable collection from the Puuc region that we have compared to Yaxuná. There appear to be two primary moments of contact between Yaxuná and the Puuc Hills. First, several members of the Selz Foundation project have argued that the Early Classic dynasty at Yaxuná was ended by a rival lineage from the Puuc region in the latter half of the Early Classic (Ambrosino et al. 2003; Ardren 1997; Freidel et al. 2003; Suhler 1996; Suhler and Freidel 1998). The massacre of the royal family deposited in Burial 24 seems to mark the end of a dynasty and the onset of a new political power likely supported by, or related to, Oxkintok located along the north end of the Puuc area (Ambrosino et al. 2003: 116).

Between AD 550 and AD 600, ceramic types that were common in the western portion of the peninsula (including Oxkintok) appeared at Yaxuná, including Maxcanú Buff and several of the thin wares (see Varela Torrecilla 1998). Second, there is a clear adoption of Slate Ware ceramics and veneer "Puuc-style" architecture around the early- to mid-portion of the eighth century AD. Local ceramic attributes and construction techniques continue at Yaxuná at this time, indicating continuity of local traditions, but Novelo Rincón (2012) argues that the material changes indicate the arrival of Puuc control of the site.

In some, but not all, of the analyses the Puuc sample is included in a general cluster with the Yaxuná data. In general, the dental morphological data from Yaxuná do not correlate particularly well with the data from the Puuc region. Again, we might argue that this lack of affinity might indicate that, while there was cultural interaction, it did not result in intense biological interaction. This apparent lack of individual contact between Yaxuná and the Puuc Hills is confirmed also by the isotopic data, as indicated by Price and colleagues (2017). As Cucina and his colleagues (2015) have noted, the Puuc sample behaves somehow erratically in terms of population affinity based on dental morphology. We suggest that this might have something to do with the nature of the population at sites like Oxkintok. Regarding this point, Varela Torrecilla and her colleagues (2009; see also Varela Torrecilla 1998) draw attention to the idiosyncrasy of this Puuc site during the Classic period, emphasizing its allochthonous character and its direct participation in the salt trade coming from the western coast of the Yucatán Peninsula (most likely through Chunchucmil). This might explain why the collection does not cluster clearly and constantly with some specific group, like for Yaxuná and Dzibanché or Noh Bec and Kohunlich. These latter two sites appear to group together in the majority of the cases, confirming what was already noted by Cucina and his colleagues (2015). Although these two sites do not group directly with Yaxuná, they tend to form part of extended clusters that include Yaxuná. Cucina and his colleagues (2015) argue that the pattern found at Noh Bec and Kohunlich indicate that they were part of a southeast to northwest inland corridor. Given their link to the Yaxuná population, we believe that this "biological" corridor might have also encompassed (at least peripherally) the region of Yaxuná. It is not a difficult stretch of the imagination to suggest that this corridor is somehow related to the Yaxuná-Dzibanché connection, considering that southern Quintana Roo lays to the southeast of central Yucatán.

The presence of Chichén Itzá in the cluster with Yaxuná can be explained with the short geographical distance between the two sites (some 18 km between site centers). The dental collection from Chichén Itzá used in this study derives from the architectural complexes of Las Monjas and El Caracol, dated to the Late/Terminal Classic, before this city's apex and its extensive political and economic expansion. At this time, the hegemonic influence of Chichén Itzá may have been relatively limited. The fact that the samples from Chichén

Itzá come from very important monumental groups leads us to believe that they could be the remains of people from other communities (for example, captives placed as offerings [see Becker 1992]). In any event, all indications point to strong affinities between the people of Yaxuná and the individuals interred in the Las Monjas and El Caracol; given the physical proximity between the two sites, it is difficult not to imagine that some sort of population contact had occurred as part of the local and regional movement of people in between settlements and cities. Unfortunately, the close proximity between the two centers limits the information that strontium and oxygen isotopes can provide on possible individual movement from one site to the other.

Finally, dental data indicate a lack of affinity between the sites along the northern shores of the peninsula (e.g., Xcambó and Jaina) and Yaxuná. Although few individuals present strontium ratios that are higher than the range that characterizes local people at Yaxuná, only one individual (B21) presents a $^{87}Sr/^{86}Sr$ ratio (0.789) that can be related to the peninsula's northern territories, although this individual's oxygen ratio is seemingly too high to belong to the northern fringes. Although this lack of affinity is surprising at first glance, it confirms previous findings concerning the presence of a marked separation between coastal and inland sites. It suggests once more a separation between coastal and inland territories in the Maya northern lowlands; it did go beyond diet and lifestyle, since it also included limited biological connections between family networks and cultural ties (as witnessed by distinctive head-shaping practices) (Cucina 2015; Cucina et al. 2015; Tiesler 2012; Tiesler and Cucina 2012a).

It is quite likely that the maritime merchant populations favored the spread of goods and people along the coastal corridor, leading to dental traits that distinguished them from the inland. In fact, the continued development of coastal commercial routes during the Classic period may have provided direct competition to inland trading routes established as early as the Formative period (see Loya González and Stanton 2013, 2014; Stanton 2012). Coastal centers produced and traded salt and marine resources in exchange for other essential or luxury goods, or redistributed goods being traded through maritime pathways. The presence of inland corridor sites (Dunning and Andrews 1994) along the coastline of the Yucatán Peninsula permitted the distribution of goods from a coastal maritime trade network to inland sites within an inland distribution network that was in contact with coastal centers only through so-called gateways (Dahlin and Ardren 2002; Jackson and McKillop 1989; Masson and Freidel 2002; McKillop and Healy 1989), and that allowed distribution or redistribution of goods among the inland communities not easily reached by the coastal trade (González de la Mata and Andrews 1998). We believe it likely that the development of a relatively separate Maya culture and society along the coast can be distinguished from inland sites.

CONCLUSIONS

Analyses of dental morphology have allowed researchers to recognize patterns of biological affinity or diversity in the Maya area at the regional level (Aubry 2009; Cucina 2015; Cucina et al. 2008, 2015; Price et al. 2017; Tiesler and Cucina 2012a; Wrobel 2004). Further, the studies of the relative proportions of strontium isotopes have allowed researchers to detect the presence of individuals whose place of origin (birth) was not the same where they died and were interred (Price et al. 2008, 2017; Scherer and Wright 2015; Sierra Sosa et al. 2014a, 2014b; Wright 2005a, 2005b, 2012). At Yaxuná the combined evidence of dental morphology and strontium isotopes suggests that the majority of its inhabitants were local. Nevertheless, the presence of 33% nonlocal people is slightly higher than those calculated for other Maya sites (see Cucina et al. 2015; Sierra Sosa et al. 2014a; Wright 2012); this may be a product of the location of Yaxuná along ancient trade routes. In any event, most movement of peoples at Yaxuná occurred within the area delimited as the northern lowlands, creating a local, microregional population dynamic.

Some evidence suggests higher levels of contact between Yaxuná and southern Quintana Roo. Given the dental morphological evidence for a connection between southern Quintana Roo and Noh Bec as well as the material links between Yaxuná and the southern lowlands, we hypothesize that there was a biological and commercial corridor in existence for some time between the Dzibanché area and Yaxuná. This corridor would have passed through the southern cone of Yucatán, where future research may shed further light on the southern-northern lowland connection.

3

GROWING UP IN YAXUNÁ

Demography, Lifestyle, and Health in a Classic Period Capital

INTRODUCTION

GIVEN THE IMPORTANCE of paleodemography in other parts of the world, surprisingly little attention has been bestowed on the rich potential that the archaeologically retrieved remains of ancient peoples have for the study of internal population structures and mortality profiles of the pre-Contact Maya. Most research in the Maya area continues to rely on what we would term archaeo-demographic investigation: the indirect assessment of population size, density, distribution, and change from archaeological settlement data (see, for example, Fry 1990; Rice and Culbert 1990). While settlement data are particularly relevant for discussing population estimates, numerous problems are faced by researchers; first and foremost is how to adequately calculate relationships between material culture and population numbers (e.g., floor space, number of houses) and whether settlement features are contemporary. Yet beyond these issues, a discussion of population size and demography using only material culture is limited in scope as it does not address the actual people of the past. Using a paleodemographic approach with actual human remains, we can attempt to reconstruct mortality profiles and estimates of living populations by quantifying age-at-death estimates and sex determinations in skeletal remains. In demographically representative burial series, these distributions reflect the age-related mortality and fertility profile (or growth) of a given residential group. While increased fertility usually results in population growth and a greater proportion of subadults in the archaeological record, mortality curves inform about collective health and living conditions. Given this potential it is no wonder that there has been ample cross-fertilization between paleodemography and its sister field, paleoepidemiology (see Storey 1997; Whittington 1989; Wright 2006 for such approaches in the Maya area).[1]

This is not to say that paleodemographic and paleoepidemiologic analyses are without flaws. In fact, there have been several cogent discussions concerning the limitations of effective work along these lines among past burial populations where written records do not offer further glimpses of demographic contexts (Wood et al. 1992). Paleodemographic reconstructions of archaeological populations are wrought by unresolved caveats and unsustained assumptions, and we must be aware of their limitations. The first one presumes stationarity (i.e., zero growth; with r = 0) of populations, which—if not correct—miscalculates both mortality and age structure, resulting in grossly misleading calculations of life expectancy. In this regard, it bears repeating Ken Weiss's cautionary remark that "if an unbiased, representative sample [. . .] cannot be assumed, further demographic analysis is not likely to be productive" (Weiss 1973:58). Second, traditional methods of skeletal age estimation tend to underage an assemblage's oldest individuals and overestimate the youngest adult classes (Hoppa and Vaupel 2002), again skewing the reality of past population demography in important ways.

These and more regionally relevant shortcomings in paleodemography are showcased in all reconstructions of ancient Maya demography using the actual burial record. For example, poor organic preservation in the Maya area translates to reduced sample sizes that add to the biases introduced by selective mortuary pathways and the limitations in anthropological methods, as outlined above. Only recently have scholars working in this region begun to tackle these issues using fresh approaches. In some studies, age biases in disease distributions have been dealt with to some success by analyses that focus on chronic deficient diseases and stress episodes among subadults (Storey 1992, 1997). A number of colleagues have inferred population fertility and growth directly from settlement survey data or modeled after traditional populations with known fertility data or from the skeletal age-class ratios themselves, including careful prospection of burial representativeness before drawing demographic conclusions (Márquez Morfín and Hernández Espinosa 2007; Márquez Morfín et al. 2002; Storey et al. 2002; Storey and Hirth 1997; Sierra Sosa et al. 2014a; Tiesler et al. 2005; Whittington 1989; Wright 2006).

Keeping these problems and possible solutions in mind, this chapter explores and regionally contextualizes the vital information of the four dozen individuals that make up the skeletal series from Yaxuná. We examine the age at death distribution of the sample and discuss the relevance of adult versus juvenile and infant age at death for reconstructing mortality profiles. This demographic frame (sex and age at death) provides the cornerstone for further reconstruction and understanding of any ancient population's biological and cultural dynamics. By comparing the frequency of nonspecific childhood stress markers among both the female and male inhabitants of the site and contextualizing them in the broader region, we can explore how inland (versus coastal) subsistence and urban lifestyle (versus rural lifestyle) could have influenced the well-being and quality of living of the ancient people at Yaxuná. This contextualization also sets the stage for explorations of gender and social ages in chapters 5, 6, and 7.

REVIVING YAXUNÁ'S DEAD

The remains available for this paleodemographic reconstruction span the Early Classic (Yaxuná II), Late Classic (Yaxuná III), and Terminal Classic (Yaxuná IV), a total of 45 individuals were included in this study, from which we excluded the early modern female teenager (Burial 10) and the male adult of the Postclassic period (Burial 19). Of these, 13 are dated to the Early Classic (dominated by the occupants of Burial 24's multiple assemblage) and 32 are associated securely to Late and Terminal Classic contexts by way of direct radiocarbon dates and/or ceramic associations with the burial contexts (see also chapter 6). Preservation is less than optimal for most of these skeletons, a number of which are quite fragmented or anatomically incomplete (see burial descriptions in chapter 6). Anatomical representation ranges from 1 to nearly 100%. Twelve remains are likely nonfunerary deposits, as we will argue in chapter 6. The remainder stems from what we assume to be "ancestral assemblages," some of them with signs of desecration.

Sex was determined in adults and late adolescents (from about 15 years of age and up) using available macroscopic dimorphic features in the pelvis and the skull (Buikstra and Ubelaker 1994). Additional measurements on long bones and talus segments were conducted by using regression formulas founded on sexed Maya reference populations (Tiesler 1999; Wrobel et al. 2002). The combined methods allowed for 33 assignments for probability of sex in the adult or close-to-adult burial segment of the Classic period (84.6%; N = 41). Of the sexed individuals, 16 were determined to be female or probable females and 17 were classified as males or probable males.

Age at death was estimated from standard morphological features in the pelvis (Bass 2005; Brooks and Suchey 1990; Lovejoy et al. 1985; Todd 1921) and complemented by an analysis of general degenerative patterns, as described by Buikstra and Ubelaker (1994). This improved the perspectives of age estimation in those skeletons of elderly individuals above the 50-year threshold. Most individuals were sufficiently well preserved, which allowed us to compare different methods of age estimation, leading to an improved assessment of age ranges and their allocation into eight age intervals: fetus, perinatal, infant, child, adolescent, young adult, middle-aged adult, and elderly adult (table 3.1), following standardized age classes set forth by Buikstra and Ubelaker (1994).

The bar sequences, displayed in figures 3.1 and 3.2, show the overall death distribution. This includes individuals of all age groups, but peaks in the group of middle-aged adults. The adult age distribution echoes the middle-adult peak of a number of other pre-Hispanic lowland Maya sites for which a sufficient number of resident population could be scored, such as Altar de Sacrificios and Ceibal or, further north, Kohunlich (Saul 1972; Scherer 2015; Tiesler 1999; Wright 2006:31). However, and despite the apparent balanced proportion between males and females, this profile is a far cry from any snapshot of long-term demographic dynamics at Yaxuná. This is the direct expression of the caveats already outlined at the beginning of this chapter, as well as any potential biases in terms of sampling strategy and the differential treatment of the dead by the ancient Maya themselves; not all individuals might have been buried in architectural contexts, for example. As we can see, there is an underrepresentation of the elderly in this burial collection, probably an artifact of methodological shortcomings in age determinations beyond the 50-year threshold and an expression of poor preservation, which affects osteoporotic senile members of the mortal community more than their younger peers with their fully retained bone masses.

TABLE 3.1. Classic period burials with information regarding sex, age group, and type of context.

BURIAL NUMBER	SEX	AGE CLASS	MIN. AGE	MAX. AGE	MEAN AGE	TYPE OF CONTEXT
1	—	Child	5	7	6	FUN
2	F?	MAdult	40	45	42.5	FUN
3	—	Adult				FUN
4	F?	Adolescent	12	18	15	FUN
5	—	Child	3	4	3.5	FUN
7	M?	YAdult/MAdult	30	40	35	FUN
8	F	MAdult	35	45	40	FUN
9	—	Child	3	5	4	FUN
11	F?	Adult				FUN
12	F?	Adult				FUN
14	M	YAdult/MAdult	25	45	35	FUN
16	M?	Adult				FUN
17	M?	Adult				FUN
20	F	OAdult	50	70	60	FUN
21	—	Adult				FUN
23	M	MAdult	40	50	45	FUN
25	F?	YAdult	20	30	25	FUN
13A	M	Adult	30	60	45	FUN
13C	M?	Adult	30	60	45	FUN
15A	M	YAdult	25	35	30	FUN
15B	F?	Adult				FUN
15C	—	Adult				FUN
15D	—	Child				FUN
18A	—	Child	5	7	6	FUN

Likewise, infants and especially babies below one year of age appear to be greatly underrepresented in this series. We would expect these to predominate just as they do in any pre-antibiotic populations given the high infant mortalities from lethal infectious diseases and related conditions (Hoppa and Vaupel 2002). And indeed, other ancient Maya residential burial cohorts, especially those with a more favorable preservation, do integrate a substantial portion of subadults. Such is the case of most coastal settlements, such as Jaina, a small islet set off the west coast of the peninsula (López and Serrano Sanchez 1997), or Xcambó (Sierra Sosa et al. 2014a, 2014b). Multi-patio compounds at Copán have also revealed copious amounts of dead infants in extensive excavations (Storey 1997). The underrepresentation of infants, whose little bodies are more fragile not only in life but also during the decompositional

TABLE 3.1. (continued)

BURIAL NUMBER	SEX	AGE CLASS	MIN. AGE	MAX. AGE	MEAN AGE	TYPE OF CONTEXT
18B	—	Infant/Child	2	4	3	FUN
24-14	M?	MAdult/OAdult	35	55	45	FUN
28 (2011)	M	MAdult	40	55	47.5	FUN/ SAC FUN?
6A	—	YAdult/MAdult	25	45	35	FUN
13B	M	YAdult	20	35	27.5	FUN?
24-5?	F	MAdult/OAdult	40	55	47.5	SAC FUN
24-10	F?	Adolescent	13	18	15.5	SAC FUN
24-11	M	MAdult	35	45	40	SAC FUN
24-7	M	MAdult	40	45	42.5	SAC FUN
24-6	F	Adolescent	14	16	15	SAC FUN
22	M?	Adolescent/Adult	15	40	27.5	ESC
26-cr.	M?	Adult	30	70	50	ESC
27 (1996)	F?	Adolescent	13	17	15	ESC
27 (2011) (27-1)	M	YAdult	20	22	21	ESC
27-1CR (2011) (27-2)	F?	Adolescent	13	17	15	ESC
24-1	F?	YAdult	20	25	22.5	EXE ESC
24-12	—	Fetal or Perinatal	0	0	0.25	EXE ESC
24-2	F?	Child/Adolescent	10	14	12	EXE ESC
24-3	—	Child	8	9	8.5	EXE ESC
24-4	M?	Adolescent	12	15	13.5	EXE ESC
24-13	F	YAdult/MAdult	25	40	32.5	EXE? ESC

M = male, M? = probably male, F = female, F? = probably female; Perinatal [0 yrs.], Infant [0–3 yrs.], Child [3–12 yrs.], Adolescent [12–20 yrs.], Young Adult [20–35 yrs.], Middle Adult [35–50 yrs.], Old Adult [over 50 yrs.], Adult [20+ years]; FUN = ancestral, FUN SAC = desecratory, EXE = containers, ESC = offerings and problematic deposits.

process (for their higher contents of water and organic substrate) at Yaxuná is likely related in many ways to poor preservation, sampling strategies by archaeologists, and burial practices by the ancient Maya themselves more than any significant demographic trend. Considering the potential of poor preservation one step further, it is even possible that many of the subadult burials, although exposed during excavations, will remain unrecognized as such; they simply may just not preserve well enough. Naturally, if this is the case, it begs a host of other questions in regard to the implied lack of proper burial offerings or the misidentification of offerings as construction caches. Yet this is a difficult if not impossible issue to resolve at this stage.

Apart from preservation issues, as stated briefly above, we do have to legitimately question whether the paucity of infant remains in the Yaxuná sample might be due to different burial

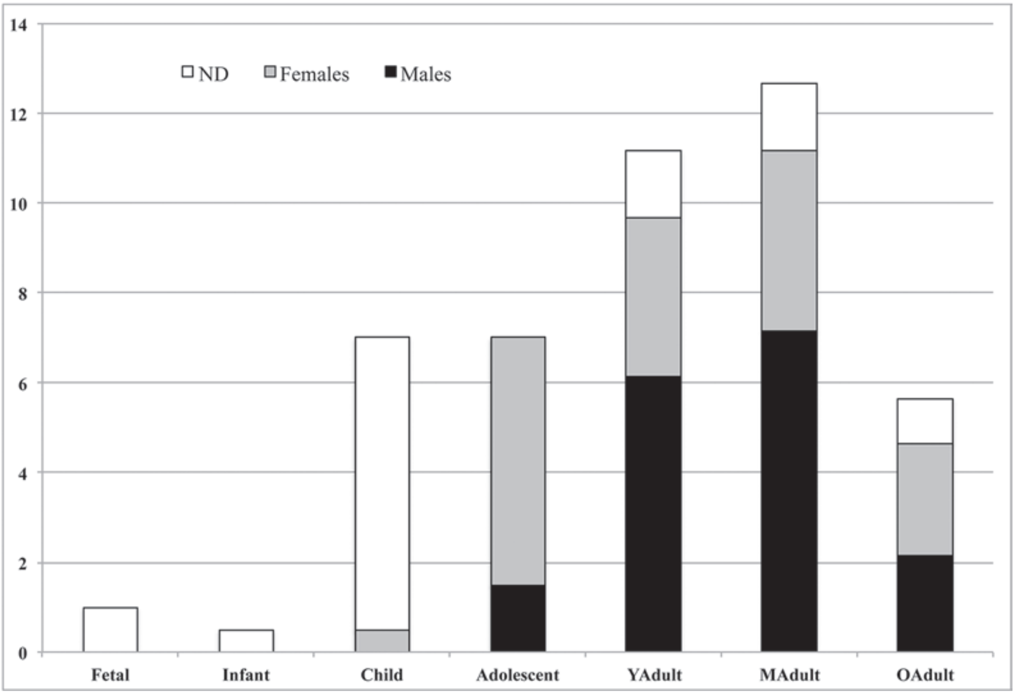


FIGURE 3.1. Overall age-at-death distribution of the burial population from Yaxuná dated to the Classic period. The adults of undetermined age range were distributed proportionally across the age classes.

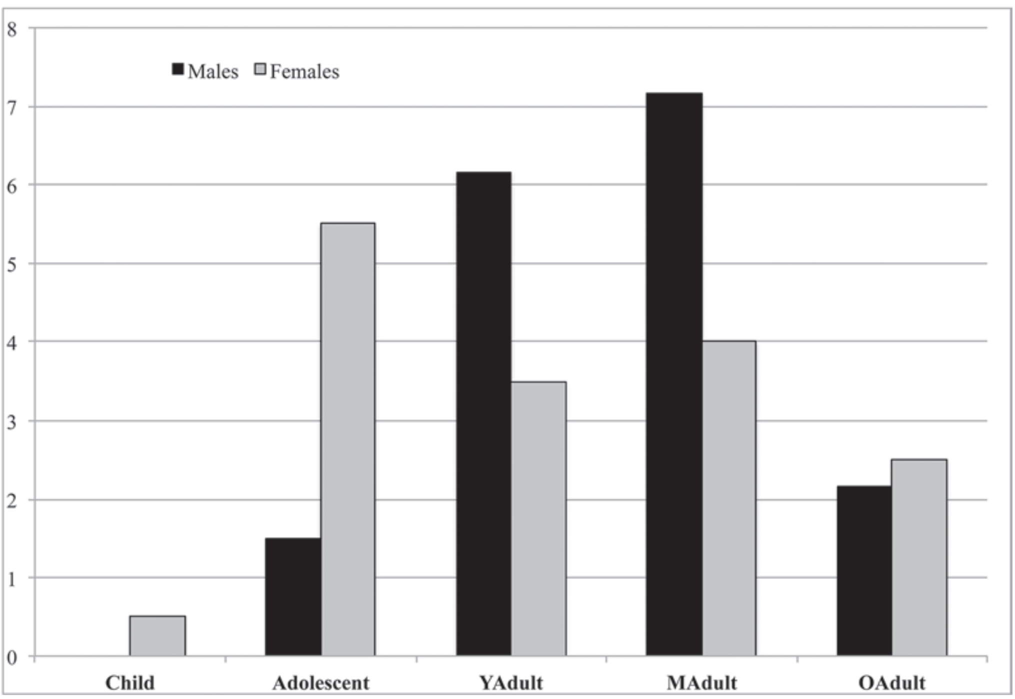


FIGURE 3.2. Age-at-death distribution of the Classic period burial population from Yaxuná by sex. The adults of undetermined age range were distributed proportionally across the age classes.

FIGURE 3.3. Perinatal Burial 24-12 (photo by R. López).

practices regarding subadults in this part of the Maya world (figure 3.3). For example, the settlement across Xcambó literally brims with disarticulated infant remains, which appear to have been treated not so much as proper burials but rather as refuse (Ceballos 2014). This treatment (or lack of treatment if you will), speaks to the notion of babies as proper earth offerings, human seeds to fertilize the soil and bring back new life (Becker 1992). It may also speak to the dehumanization of infants until they reached a specific age and the grave dangers causing high infant mortality had passed. These ideas resonate with many past and present native Maya rituals and beliefs.

So, for the reasons of reduced sample size and the numerous potential biases we have discussed, it is quite impossible to generate a feasible demographic reconstruction for the excavated residents of Yaxuná with the information at hand. Thus, we will wisely refrain from elaborating on life tables or reflecting on topics such as survivorship and snapshots of age distributions. Further, no estimate on life expectancy is warranted in this specific series, in contrast to other more analytically amenable Maya burial series (Márquez Morfín et al. 2002; Sierra Sosa et al. 2014b). In those, life expectancy has been estimated to be 25 to 35 years, which in each reconstructed scenario hinges heavily on inferred fertility rates and infant mortality.

Despite all the limitations for Yaxuná's burial sample, there is hope. We are still able to cautiously address at least some trends in the sample and link them to insights gained from other sources of information about mobility and residence—namely, those laid out in chapter 2. The first of these trends regards the nondemographic character of the death profile itself, which we should take at its face value. Paleodemographic reconstruction works best on stable, stationary, and endogamic populations. As we learned in chapter 2, the families of Yaxuná were anything but that. Instead, mobility characterizes the people of this site just like most other Maya settlements of the first millennium AD. Shifts in residence appear to be common among the Classic period Maya (especially during times of crises) and are reflected by the isotopic signatures, which at Yaxuná imply that almost a third of its Classic period residents had moved into this settlement from other locations, some having moved there from quite some distance. Of course, we get only a glimpse of in-migration with these data. Out-migration is an entirely different story. Even if we could identify isotopic signatures similar to those from Yaxuná in other areas of the Maya world, given that only general regions can be identified, not specific localized communities, we could not be certain that these individuals actually came from Yaxuná, just the general region in which Yaxuná is located. We assume that out-migration occurred at Yaxuná, considering the high level of mobility across the Yucatecan plains and the active engagement of Yaxuná in long-distance trade, but we cannot say much more about it with the current methods and data available.

One further aspect regarding the nature of the burial assemblage at Yaxuná that is worth discussing is cause of death, as inferred from the mortuary record (figure 3.4; see also chapter 6 of this volume). For example, as we examined the age at death of the remains of the 12 individuals in Tomb 24—most or all of whom were presumably killed (see chapter 7 of this volume)—we recognized that their age-at-death profile is significantly lower than that of other contexts, most likely representing the remains of ancestors who may have died for any number of reasons (table 3.1). In the case of Burial 24 the average age at death of the occupants is 25, even if we exclude the probable full-term baby (Burial 24-2) in the womb area of an adult female. This is considerably younger than the age profile of other Yaxuná burials, identified as reverential. While we must be careful with a sample as small as the one we have from Yaxuná, these types of patterns have the potential to shed light on particular behavioral dynamics at the site. In this case it begs the questions concerning who might be represented among the dead and why they were selected for this kind of death. We assume that we might be looking at the death of the close kin of the primary individual in the tomb, but we will take this scenario up again in chapter 7. In any case, the cause of death is an important factor to take into account.

We also compared individuals from different kinds of contexts, including those with clear funerary treatments, those without any clear funerary status, and still others from outright sacrificial contexts, as indicated by perimortem marks of violence and deviant deposition.

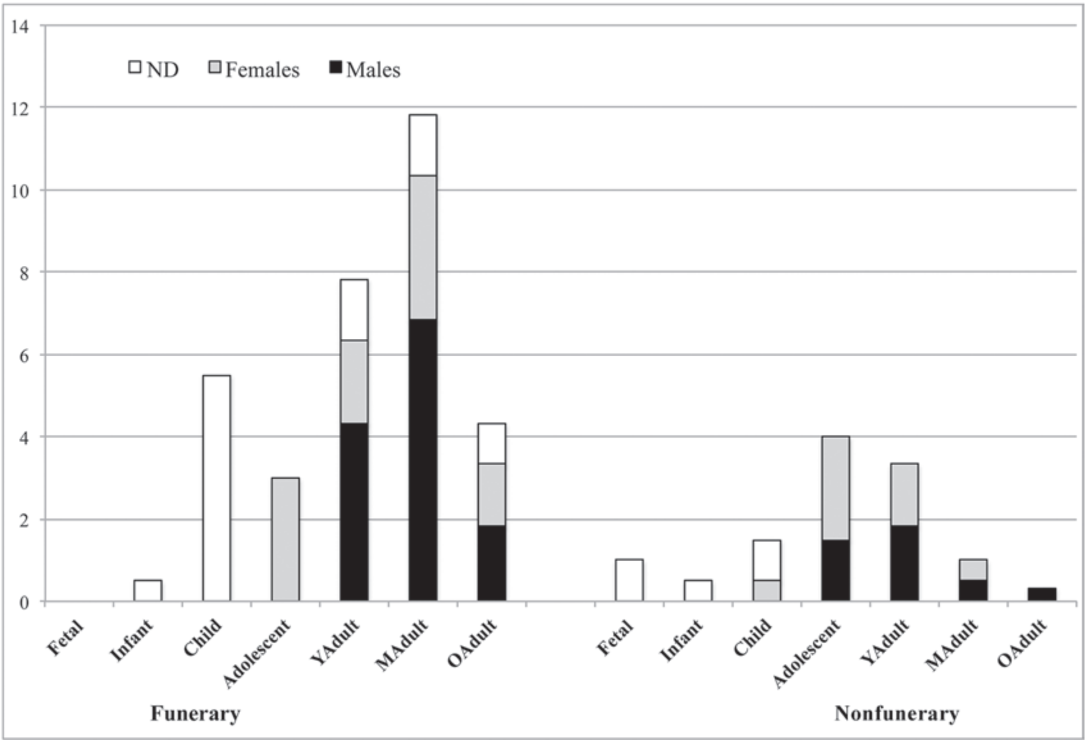


FIGURE 3.4. Age-at-death distribution of the Classic period burial population from Yaxuná according to funerary or nonfunerary status.

The analysis of these groupings provided some interesting results. For example, we see that older children, teenagers, and young adults outnumber older adult individuals in contexts with no clear funerary treatment. This pattern contrasts with contexts with clear funerary treatments, called "ancestral contexts," that are characterized by a predominance of middle-aged adults (figures 3.4 and 3.5). Since individuals from nonfunerary contexts are much less likely than individuals from ancestral contexts to represent natural deaths, this implies that violence (ritual or otherwise) may have been more common among the individuals in the former group, represented more by the young than by the middle-aged or the elderly.

This same trend is recognized in large deposits of sacrificial remains, such as the assemblages recovered from the depths of the Sacred Cenote of Chichén Itzá. When we combine the skeletal information from this context, obtained from the combined collections recovered by Piña Chan and Thompson, the minimum number of individuals (MNI) surpasses 150 through a count of skull caps and mandibles (Cucina and Tiesler 2014; Tiesler and Cucina 2007; see also Anda 2007; Beck and Sievert 2005). Our analysis demonstrates that the collection comprises a disproportionate number of youngsters (around 50%) who died in the second half of their first life-decade (between 5 and 10 years) or during their second decade (between 10 and 20 years). Other authors who have studied similar contexts, such as Lori Wright (2006:30–36), have likewise posited that increased proportions of young adults among the dead, such as those

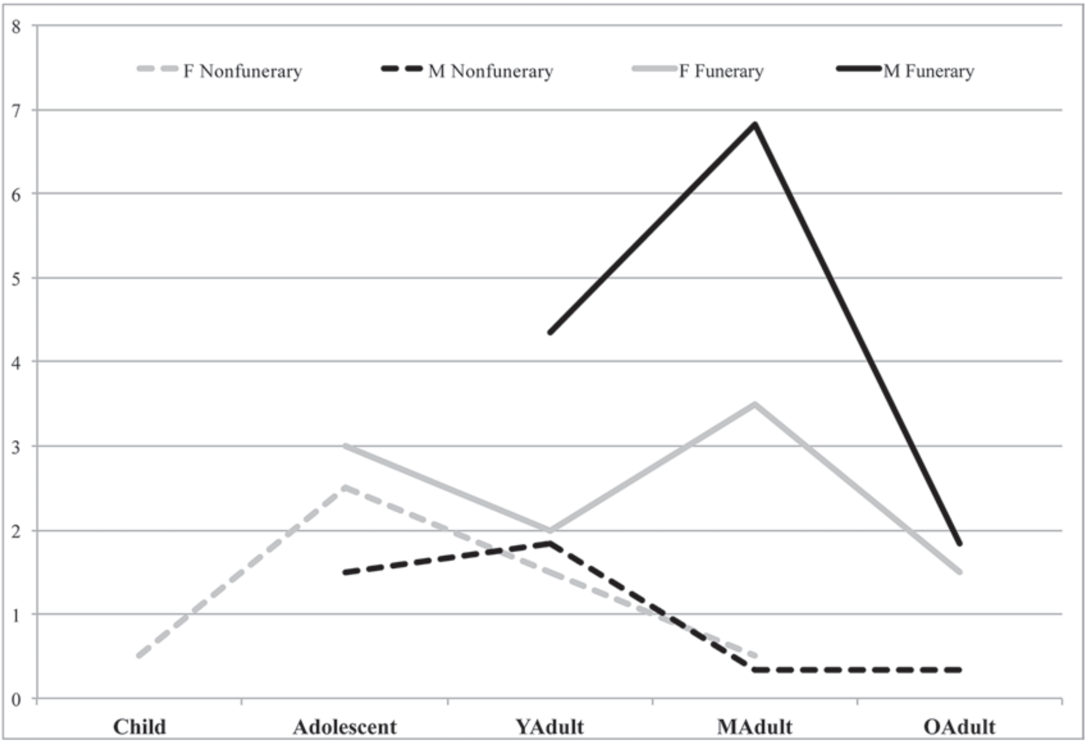


FIGURE 3.5. Graphic curve of age-at-death distribution of the Classic period burial population from Yaxuná according to funerary or nonfunerary status. Dotted lines represent nonfunerary individuals (males in black, females in gray).

documented in a number of Terminal Classic sites around the Maya lowlands, reflect the victims of interpersonal violence in a climate of war and collective crisis. We think that this connection, however subtle, could indeed hold true. Situated right in the middle of the age curve, the frequency of young adults will not be biased as much by specific degrees of fertility as the age ranges at both extremes of the mortality scale, especially children.

GROWING UP IN YAXUNÁ: NONSPECIFIC MARKERS OF CHILDHOOD STRESS

Death, and when it occurs, is really the ultimate consequence of our health and lifestyle. In the following section, we discuss these factors in terms of what we can glean from nonspecific markers of childhood stress. Specifically, we analyze and discuss a number of general adverse conditions that leave their trace in teeth and bones. These data have been gathered under the denomination of "markers of unspecific stress" and denote a host of conditions that were sufficiently chronic and/or severe enough to impact skeletal metabolism during the early years of an individual's life, leading to more or less permanent morphological changes (Larsen 1997).

FIGURE 3.6. Linear enamel hypoplasia in a mandibular canine. The tooth shows four horizontal grooves, the deepest and most severe one exposing the dentine underneath. Such disruption occurred approximately between two and three years of age (photo by A. Cucina).

LINEAR ENAMEL HYPOPLASIA

Linear enamel hypoplasia (LEH) is a deficiency in the enamel thickness produced by a temporary disruption of the growth process, which is triggered by stress episodes during the depositional (amelogenetic) phase of tooth formation (Goodman and Armelagos 1985). Macroscopically, LEH appears as horizontal lines or grooves of reduced enamel thickness, which may include dentine exposure in the more severe cases (Hillson 2008) (figure 3.6). This developmental stress marker has been associated with a large number of potential disruptive conditions of an individual's homeostasis, meant here as the organism's physiological and chemical balance. Qualitative and/or quantitative nutritional deficiencies have been identified as possible triggers for LEH, which are by themselves often related to preferential access to resources (Goodman and Rose 1991). This identification fosters the idea that better living conditions and higher social level are expected to buffer against the development of stressful conditions during childhood and beyond. Other factors involved in the onset of LEH include more specific infectious and metabolic diseases (as described by Hillson 2008). Given that LEH has been connected to more than 100 different factors, it is considered as a nonspecific systemic indicator of stress (Goodman et al. 1980; Kreshover 1960). Since dental enamel does not undergo any remodeling once it is laid down (Hillson 2008), it retains any single mark of stressful event that occurred during its formation. For this reason, whereas enamel is not worn out by attrition, LEH remains on the surface of the crown as a permanent, indelible record of the (single or multiple) occurrence(s) of disruptive developmental events during the early years of life of the individual, even when the person has reached adulthood.

For our research at Yaxuná, we scored linear enamel hypoplasia on each permanent tooth from the sample using a handheld 4× magnifier or a 5× loupe under tangential light. Each crown was scrutinized to detect any horizontal striations. In all cases, indications of defects were first identified by the naked eye. The presence of these defects was subsequently confirmed with the use of the loop magnifier.[2] For anterior teeth (incisors and canines), all defects were counted and their distance from the cemento-enamel junction was measured using a Mitutoyo® Digital caliber. In turn, premolars and molars were scrutinized to detect only the presence of defects, regardless of their number or position on the crown itself. Although defects had been scored on all teeth, the presence and number of LEHs by tooth type were accounted only on the tooth (left or right of each type) that manifested the higher number of defects. Due to the reduced sample size, the age of formation of each defect, which can be estimated based on the position of the defect on the crown, was not calculated.

Table 3.2 shows the presence and number of linear enamel defects on the crowns of the individuals from Yaxuná. Defects range from absence (zero), which means that the crown surface was free from developmental marks, to as many as six repetitive defects that afflicted the individual during the time of formation of the crown. Anterior teeth tend to show higher frequencies of defects compared to posterior ones (Goodman and Armelagos 1985). However, contrary to the expectations, the canines (and in particular the lower canine) show a reduced average number of defects (0.82 in the mandibular canine in comparison with 1.73 in the maxillary central incisor).

The presence of linear enamel hypoplasia in the permanent dentition of the sample from Yaxuná denotes relatively healthy conditions. The low average values in the anterior teeth are altered by three cases that present six defects in the maxillary central incisor: Burial 24-2, Burial 24-14, and Burial 27-1. The first two cases correspond to individuals recovered in an Early Classic tomb, associated with the remains of Burial 24-1. Burial 27-1 corresponds to the young-adult individual found inside a rock-shelter context on the North Acropolis in a very peculiar mortuary position. All three individuals also present four defects in the lateral incisors, and in one individual (B27-1) even three defects in both the maxillary and mandibular canines. With the exception of these three outliers, such low values seem to be indicative of relatively stress-free developmental conditions. However, for a better understanding of the environmental impact on the people living at Yaxuná, a comparative analysis with other sites in the Classic period lowlands is presented in table 3.3 and figure 3.6.

The data for LEH at Yaxuná indicate that, at least in this small sample, the population was not so much impacted by stressful environmental conditions in comparison to others sites from the Classic period across the Maya lowlands in our database, even during the tumultuous Terminal Classic period (table 3.3 and figure 3.7). Other studies have analyzed LEH in Maya sites (see, for example, Whittington 1992), but the way data are presented makes comparisons with Yaxuná impossible. With few exceptions, however, Yaxuná presents frequencies per type of tooth that are noticeably lower than their counterparts, in particular when taking into consideration the upper and lower canines and the maxillary central incisor, which are considered the teeth most susceptible to, and therefore mostly representative of, stressful environmental events (Goodman and Armelagos 1985). On the contrary, the site showing the highest percent values for all the anterior teeth is Xcambó, located along the northern coast of the Yucatán peninsula (Cucina 2011; Méndez Colli et al. 2009), followed by sites in Petén. Noh Bec's hypoplastic data, which are represented only for the maxillary

TABLE 3.2. Individual presence and frequency of enamel defects in the maxillary and mandibular dentition. Numbers indicate the number of defects recorded on the same tooth, while "x" indicates that the tooth presented defects on its surface but the real number could not be quantified; "x" is used to calculate percent frequencies but not for the arithmetic means.

MAXILLA													MEAN	%
I1	0	0	0	6	2	6	2	0	1	0	2	6	1.73	58.3
I2	0	0	0	4	0	2	1	1	0	1	4		1.18	54.5
C	0	0	0	0	0	0	0	1	0	1	0	3	0.42	25
P3	0	0	x	x	0	0	x							42.9
P4	0	0	x	x	0	0	0	0	x					33.3
M1	0	0	x	0	0	0	x							28.6
M2	X	0	0	0	X									40
M3	X	0	0	0	X	0								33.3
MANDIBLE													**MEAN**	**%**
I1	0	x	x	0	2	0	0	0	1	x	x		0.43	54.5
I2	0	0	0	0	0	0	2						0.29	14.3
C	0	0	0	0	2	0	0	3	3	0	1		0.82	36.4
P3	X	0	x	0	X									60
P4	0	0	0	0	X	0	0							14.3
M1	0	0	x	0	0									20
M2	X	0	0	0	X	0	x							42.9
M3	0	0	x	x										50

anterior teeth, always reach 100% of frequency; however, the reduced sample size for this site limits reliable comparisons.

If frequency of defects by tooth type is an indicator of how many individuals experienced stressful events during childhood, a more detailed indicator of the extent of stressful impact on each individual is represented by the mean values of the number of hypoplastic defects on each tooth type. In fact, despite the fact that two individuals may have been affected by defects (and therefore be counted equally in the frequency of affection), the times each individual suffered from stressful events is indicative of isolated or repetitive events during infancy (Cucina 2011).

Table 3.4 shows the comparison of mean values between Yaxuná and Xcambó (Cucina 2011), the latter divided by age groups (subadults versus adults); the small sample size of Yaxuná prevented a similarly detailed comparison by sex. As Méndez Colli and colleagues (2009) and Cucina (2011) have highlighted, Xcambó lies in the middle of the peninsula's coastal tropical marshland, which constitutes a harsh environment in terms of pathogenic load (see Sattenspiel 2000). It is not surprising, therefore, that this coastal human group

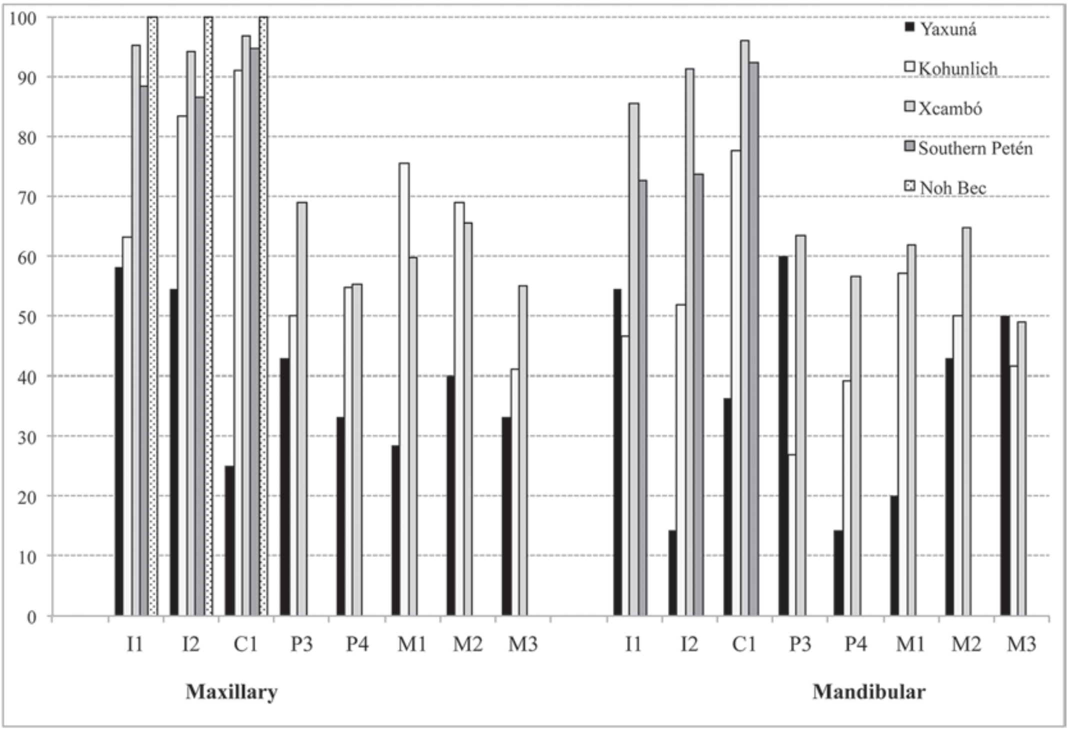


FIGURE 3.7. Graphic representation of frequency of linear enamel hypoplasias by tooth type among Classic period sites.

underwent a heavy toll and experienced difficult health conditions. Nonetheless, when general frequencies of LEH are considered for inland sites in our database, Yaxuná still presents much lower values in comparison with sites such as Noh Bec, Kohunlich, and those in Petén, which are not located close to marshy environments.

As mentioned above, linear enamel hypoplasia is a general, systemic, and nonspecific indicator of developmental stress, caused by more than 100 potential factors (Goodman et al. 1984; Kreshover 1960). Given the wide array of environmental, biological, cultural, and individual variables (e.g., host resistance) involved in the onset of and the buffering from hypoplastic defects, a direct comparison between contexts is often difficult to carry out. It is doubtless that experiencing few or no defects at all and reaching adult ages contradicts the "osteological paradox" (Wood et al. 1992); these individuals were not selected against by being weak enough not to survive stressful events with no marks left to witness the suffering. The reduced frequency and mean number of LEHs at Yaxuná in comparison with the other samples could be explained as the consequences of better living conditions and improved health at the site in comparison to other sites in our regional database. Often, reduced levels of hypoplastic defects are associated with social and economic status. Leatherman and Goodman (1997), among others, rightfully claim that socioeconomic disparities are at the base of

TABLE 3.3. Comparative frequency of enamel hypoplasia by tooth type in different Classic period groups.

	YAXUNÁ	KOHUNLICH	XCAMBÓ	SOUTH PETÉN	NOH BEC
MAXILLA	%	%	%	%	%
I1	58.3	63.2	95.3	88.5	100
I2	54.5	83.3	94.2	86.7	100
C1	25.0	91.2	97.0	94.8	100
P3	42.9	50.0	68.9		
P4	33.3	54.8	55.4		
M1	28.6	75.7	59.7		
M2	40.0	69.0	65.7		
M3	33.3	41.2	55.1		
MANDIBLE	%	%	%	%	
I1	54.5	46.7	85.5	72.7	
I2	14.3	51.9	91.4	73.6	
C1	36.4	77.8	96.2	92.4	
P3	60.0	26.9	63.5		
P4	14.3	39.3	56.7		
M1	20.0	57.1	62.0		
M2	42.9	50.0	64.8		
M3	50.0	41.7	48.9		

TABLE 3.4. Comparison of mean number of hypoplastic defects in anterior teeth between Yaxuná and Xcambó (Cucina 2011).

	I1'	C'	C,
Yaxuná	1.73	0.42	0.82
Xcambó Subadults	4.44	4.78	5.31
Xcambó Adults	3.08	3.54	4

differences in health and living conditions. Nonetheless, despite the fact that the sample from Yaxuná includes multiple royal individuals, the majority of the remains unearthed from the site are not members of the elite. Interestingly, the low levels of hypoplastic defects encountered both in terms of frequency and of mean number per tooth type are not the results of a generalized low distribution of stressful events; instead, they are the product of few individuals showing many (up to six) defects, while the majority showed no lesions at all. Due to preservation, not all the individuals presented the whole dentition, so a direct comparison can hardly be carried out. Nonetheless, this uneven distribution indicates that few individuals suffered from harsh conditions during infancy, while the rest enjoyed a relatively stable, stress-free growth.

GROWING UP TO BE BIG OR SMALL

Another indirect (but at the same time more informative than linear enamel hypoplasia) measure of health is the analysis of skeletal growth interruptions as expressed by the individual's growth curve. Subadults who are adversely affected by severe, chronic episodes of hunger or disease, or multiconditional dynamics of suboptimal living conditions in general, will likely suffer growth interruption and retardation of longitudinal skeletal expansion. Typically, the dental maturation process, which is less affected by carential conditions, will be ahead when compared to the degree of diaphyseal growth (i.e., the longitudinal growth of the long bones) in skeletal segments. In female youngsters, adverse developmental conditions will lead to a cessation of longitudinal growth and also pregnancies and childbirth in the early teenage years. This halt, induced by premature epiphyseal fusion, is triggered by the hormonal changes that come with pregnancy, labor, and breastfeeding. Like proper physiological stress, reduction of final corporal height will be the consequence in fully grown women. Under general circumstances, growth interruption will push forth the age of skeletal maturity beyond 20, sometimes 25 years of age, and will also likely result in a reduced final corporal height. In other terms, final adult stature will lie below the maximum growth potential predicted for that specific population, the so-called maximum growth capacity (Bogin 1988).

In our analysis we calculated the living maximum statures from all complete and fused adult long bones of sexed individuals using the corrected version (Ángel and Cisneros 2004) of a regression originally published by Santiago Genovés (1967). Two separate formulas are provided, one for females and the other for males. For incomplete bones, we estimated long-bone maximum length, recurring to standardized anatomical segments (Steele and Bramblett 1988; Wright and Vásquez 2003) prior to calculating maximum stature. When both segments were present, we averaged the measurements. In cases where both segments were not present we used the segment that was available for scrutiny.

Taken together, the calculated male heights average 159.97 cm (N = 9), while the female statures, 145.13 cm (N = 7), are some 15 cm below the male average. Similar to these combined results (by averaging out several segments) are the estimates obtained directly from tibias and femurs, held to be the most reliable stature predictors among all segments (tables 3.5 and 3.6).

Taken alone, the 16 measurements from Yaxuná do not make the case for solid generalizations. However, when compared to other Classic period Maya skeletal series, we may cautiously lay out some tendencies demonstrated in the regional data. In this exercise, we need to bear in mind that the overall diversity in calculated maximum statures among pre-Hispanic adults is rather reduced when we apply modern scales. This has to do with a more diverse

TABLE 3.5. Classic period stature estimates (cm) for Yaxuná's males and their regional comparison (taken from Tiesler 1999, 2001, and 2004).

ANATOMICAL SEGMENT OF MALES	FEMUR (cm)			TIBIA (cm)		
	n	MEAN	s.d.	n	MEAN	s.d.
Yaxuná, B15a	1	156.63		1	158.42	
Yaxuná, B24-7	1	161.16		1	—	
Yaxuná, B27 (2011) (27-1)	1	161.26		1	162.72	
Chiapanec Highlands[a]	13	159.61	3.32	12	160.41	4.01
Southern Petén[b]	2	160.48	.32	1	164.29	—
Northern Petén[c]	4	162.82	4.81	4	163.49	2.31
Copán[d]	8	159.47	2.37	4	159.50	3.20
Maya Highlands[e]	1	165.68	—	2	165.66	4.15
Yucatecan East Coast[f]	11	161.31	5.29	8	163.95	3.83
Yucatecan North Coast[g]	23	162.6	4.0	19	162.6	3.7

[a] As represented by the burial series from Toniná, Laltic, Vayejtas, Santa Rosa, and Chiapa de Corzo, Mexico.

[b] As represented by the burial series explored by the Guatemaltecan regional project *Atlas del Sureste del Petén*, Guatemala.

[c] As represented by the burial series from Calakmul, Dzibanché, and Kohunlich, Mexico.

[d] As represented by the burial series from Copán and the Copán Valley, Honduras.

[e] As represented by the burial series from Chagüites, Acul, and Los Cimientos, Guatemala.

[f] As represented by the burial series from Xcaret, San Gervasio, Tulum, El Rey, and El Meco, Mexico.

[g] As represented by the burial series from Xcambó, Mexico.

modern population impacted by the arrival of Africans, Asians, and Europeans after the contact and more recently with modernization and globalization.

As table 3.5 shows, the statures of Yaxuná's males are quite comparable to other lowland Maya inland populations of the same sex. These, in turn, fall short when male Maya highlanders and coastal Maya are compared. The means of these other groups are several centimeters higher. These differences may be explained in part by populational differences and/or a more balanced, protein-rich diet during the growth period.

Similar to their male counterparts, the women of Yaxuná are also smaller than their neighbors from the Maya highlands and along coastal regions. Indeed, local women at Yaxuná appear particularly small. Separated some 15 cm from the average local male height, their average stature falls also a full 5 cm short of those heights displayed by Xcambó's women along the coast. This would imply that young females from Yaxuná tended to not reach their maximum growth potential, while their counterparts from Xcambó did. This finding comes quite as a surprise if we recall the exorbitantly high frequencies of dental growth disruption at Xcambó, outlined above, which for female dentitions left extensive sulci in the form of

TABLE 3.6. Classic period stature estimates for Yaxuná's females and their regional comparison (cm) (taken from Tiesler 1999, 2001, and 2004).

ANATOMICAL SEGMENT OF FEMALES	FEMUR			TIBIA		
	n	MEAN	s.d.	n	MEAN	s.d.
Yaxuná, B2	1	144.29		1		
Yaxuná, B24-1	1	145.58		1		
Chiapanec Highlands[a]	4	144.09	4.83	5	147.35	8.42
Southern Petén[b]	2	142.86	3.48	2	147.24	2.69
Northern Petén[c]	2	149.47	6.22	2	153.50	0.38
Copán[d]	4	147.69	5.18	4	146.32	2.70
Maya Highlands[e]	2	150.63	0.18	3	156.72	7.48
Yucatecan East Coast[f]	8	145.34	4.35	8	145.17	2.83
Yucatecan North Coast[g]	23	149.5	4.8	14	148.5	6.2

[a] As represented by the burial series from Toniná, Laltic, Vayejtas, Santa Rosa, and Chiapa de Corzo, Mexico.

[b] As represented by the burial series explored by the Guatemaltecan regional project *Atlas del Sureste del Petén*, Guatemala.

[c] As represented by the burial series from Calakmul, Dzibanché, and Kohunlich, Mexico.

[d] As represented by the burial series from Copán and the Copán Valley, Honduras.

[e] As represented by the burial series from Chagüites, Acul, and Los Cimientos, Guatemala.

[f] As represented by the burial series from Xcaret, San Gervasio, Tulum, El Rey, and El Meco, Mexico.

[g] As represented by the burial series from Xcambó, Mexico.

linear enamel hypoplasia. We can hypothesize that such a difference could be related to a series of factors occurring at different times in life. Despite having been somehow protected against environmental insults during their early years of life, a period of time during which intake of animal proteins is not as high as in the following years, female individuals at Yaxuná might have undergone a diet chronically low in animal proteins throughout their life, which limited their growth in stature. On the contrary, at the coastal site of Xcambó, females experienced a stressful infancy, as evidenced by LEH; yet the protein-rich diet might have granted them to compensate for the initial metabolic stress and reach taller statures as a result of the growth spurt during adolescence. Nonetheless, as for Yaxuná itself, where the limited sample size hampers broader generalizations about growth potential and childhood, we will take up this discussion again in the next chapter after discussing a number of aspects related to local nutrition and dietary habits.

4
FOODWAYS, DIET, AND NUTRITION

WHILE THE POSSIBILITIES for studying Maya cuisine from the material record may appear restricted due to the generally poor preservation of relevant archaeological data in the region (e.g., paleobotanical and faunal remains), the reality is that there have been great advances in our understanding of subsistence practices and their relationship to critical issues such as social diversity, gender, quotidian life, and religious practice. At present, we have moved far beyond the simplistic notion of a homogeneous maize-dependent subsistence (see White 1999; Wright 2006) and now know that ancient Maya diets could vary for a multitude of reasons, including location (e.g., coastal v. inland populations), status, gender, and dietary stress due to factors such as droughts and periods of intensified conflict. The latter is relevant also for our local sample because the majority of the burial contexts date to the Late and Terminal Classic periods, a time argued to be characterized by decreased precipitation and a rise in conflict in the Maya lowlands (Demarest et al. 2004; Gill 2000; Webster 2002). It is vitally important, therefore, that we take a closer look at the complexities that may have impacted people's diets in Yaxuná and its vicinity.

We begin by discussing the evidence we have at our disposal for understanding dietary patterns among the individuals represented in the burial sample at Yaxuná. Although we utilize information concerning diet from non-human material sources (such as faunal remains) and implements used to process and consume food (e.g., grinding stones, cooking pots), our primary data source for subsistence comes from the actual physical remains of the ancient people, whom we must understand within a particular ecological, biological, and social context. Accordingly, we have structured this chapter using the skeletal data as the guide. We begin by examining the dietary signatures of stable isotopes. Their proportions trace broad patterns and shifts in food consumption when scrutinized within their regional contexts. These data are complemented with a discussion of faunal remains found in middens, most of which come from one large trash pit on the North Acropolis (Stanton and Marengo Camacho 2014). Then we shall move on to questions regarding the forms and degrees of dental wear, which inform us about a number of food choices, food processing, and dental hygiene, all treated jointly under the section of "food processing." Finally, we discuss more indirect indications of diet and daily habits, as displayed by the frequencies of diseases related to nutritional deprivation.

DIETARY INTAKE FROM PATTERNING STABLE ISOTOPES

Carbon and nitrogen stable isotopes have long been used to infer diet in archaeological populations. Isotopes are atoms of the same chemical element that have different numbers of neutrons (same atomic number, different mass number). In contrast to radiogenic isotopes, they are considered "stable" if they are not subject to radioactive decay over time. Analyses of the stable isotopes of carbon and nitrogen are used commonly to reconstruct past human and animal diets. This technique is based on the underlying rationale that the isotopic composition of consumed food is recorded on the body tissues after a predictable isotope fractionation (e.g., Katzenberg 2000; Lee-Thorp 2008); in other words, "you are what you eat." Well-preserved archaeological remains can retain the stable isotope ratios present during life and therefore provide information about the foods an individual consumed. Stable isotope results are analyzed as the ratio of the heavier isotope to the lighter isotope ($^{13}C/^{12}C$ and $^{15}N/^{14}N$) and expressed in δ-notation in parts per mil (‰), relative to internationally accepted standards (Schwarcz and Schoeninger 1991) in a similar fashion as the $\delta^{18}O$ described in chapter 2.

Although many types of archaeologically retrieved human tissues are suitable for stable isotope analysis, human remains from the lowland Maya area are almost exclusively represented by bones and teeth. These materials (with the exception of tooth enamel, which is a highly mineralized tissue) contain both inorganic (ca. 75–80% of dry weight) and organic matter (ca. 20–25% of dry weight) (Hare 1980). Most of the mineral part corresponds to hydroxyapatite (a calcium phosphate mineral), and around 90% of the organic matter is collagen protein. Each of these components has specific stable isotope ratios that reflect their chemical origin and formation; the inorganic fraction records carbon isotope ratios of the whole diet, while the organic part records carbon and nitrogen isotope ratios linked to protein consumption (Ambrose 1990, 1993). Bone and dentine bulk collagen are the preferred substrate for carbon and nitrogen stable isotope analysis, in part because collagen is the only major nitrogen source from skeletal remains, and because it provides robust quality indicators that securely record its isotopic integrity even from material that is older than 100,000 years (Bocherens 2000; De Niro 1985).

There are a few considerations to bear in mind when studying collagen isotope ratios. First, collagen reflects the isotopic signals of the main dietary protein sources rather than those of the overall diet. This is especially true for the nitrogen signal, since almost all of the nitrogen in the collagen comes from dietary protein; the carbon may be derived from other dietary macronutrients such as sugars and fats (Howland et al. 2003; Jim et al. 2004). Due to slow collagen turnover, stable isotope values from adult human bone collagen represent an averaged protein diet over a number of years prior to death (Ambrose 1990; Schwarcz and Schoeninger 1991). In contrast, collagen from dentine does not undergo remodeling and thus reflects only the diet of the specific period during which tooth formation has taken place (concretely, the different stages of infancy, childhood, and adolescence, depending on the type of tooth). Further, isotope values from dentine and bones of young individuals could be influenced by breastfeeding and weaning (Eerkens et al. 2011; Fuller et al. 2006), thus providing information not comparable to values from adult bones.

MATERIALS AND METHODS

For this study, carbon isotopes were measured as the ratio between $^{13}C/^{12}C$ of the sample over $^{13}C/^{12}C$ of the PDB standard ($\delta^{13}C_{(PDB)}$), [$\delta E = (Rx/Rs - 1) \times 1000$] (Schwarcz and Schoeninger 1991). Dietary resources frequently present a $^{13}C/^{12}C$ ratio that is lower than the PDB standard, which results in $\delta^{13}C_{(PDB)}$ negative values (Ambrose et al. 1997). Commonly, $\delta^{13}C_{(PDB)}$ is analyzed to assess the individuals' dietary dependence on C_3 and C_4 plants and on animals who fed on such plants (Katzenberg 2000). The difference between C_3 and C_4 plants rests on their respective photosynthetic pathways; C_3 plants are represented by seasonal grasses and herbaceous, green-leaved plants and trees, and are characterized by low, more negative $\delta^{13}C$ values (approximately around −18 to −28). In turn, C_4 plants, such as more tropical maize, millet, or sorghum, among others, return $\delta^{13}C$ values in between −6 and −12. Finally, CAM species (cactaceae and other succulent plants) generally return $\delta^{13}C$ values in between those obtained for C_3 and C_4 plants. We may add that the animals that feed on any kind of plants will present bone collagen $\delta^{13}C$ values that are about 3–4‰ higher than the values of the plants that they eat (Kellner and Schoeninger 2007).

The stable isotope of nitrogen ($\delta^{15}N$) is measured as the ratio between ^{15}N and ^{14}N in the same way as $\delta^{13}C$, with the only difference that the atmospheric N_2(AIR) represents the $^{15}N/^{14}N$ standard (Schwarcz and Schoeninger 1991). The $\delta^{15}N$ in plants ranges approximately between 0‰ to 7‰; leguminous plants exhibit the lowest delta values (Ambrose et al. 1997). Due to trophic increment, herbivores present a $\delta^{15}N$ about 3–4‰ higher than plants; carnivores feeding on herbivores (first-level carnivores) manifest a 3–4‰ increase compared to herbivores (Katzenberg 2000). Carnivores are found at the top of the trophic chain and exhibit the highest levels of $\delta^{15}N$ ("you are what you eat" plus 4‰). In marine environments, $\delta^{15}N$ is usually higher than in terrestrial environs (Schoeninger and De Niro 1984). Humans who have access to marine food will present a higher value of $\delta^{15}N$ than those feeding only on terrestrial resources, in particular if the marine food is represented by secondary carnivores feeding on smaller marine carnivores. Marine animals present a $\delta^{13}C$ value that is above that of C_3 plants and tend to overlap with C_4 values (Schoeninger and De Niro 1984). In maize-dependent cultures in which marine resources complement the diet intake, the use of $\delta^{13}C$ may not be entirely useful to make inferences on the amount of the marine proportion of food intake. In this perspective, high values of $\delta^{15}N$ in individuals eating marine foodstuff help unmask the effect that marine resources have on $\delta^{13}C$.

Bone samples from every individual in our sample from Yaxuná were analyzed for $\delta^{13}C$ and $\delta^{15}N$ collagen stable isotopic composition at the University of Illinois laboratory (Urbana-Champaign) based on procedures established in Ambrose (1990). Each sample was ground into bone powder and demineralized in 1 M chloric acid (HCl) for 20 minutes. Soil humic acids were then removed by treating each sample with 0.125 M NaOH for approximately 20 hours. Gelatinization was obtained by heating the specimens at 95°C for ten hours in a relatively weak acid (pH 3), which was then filtered through a glass frit filter and freeze-dried. At this stage, the organic, gelatin residue is composed in its majority by collagen; however, as Schwarcz and Schoeninger (1991) point out, the organic component may also come from other proteins that are not removed by the previous treatments, hence the use of the term "organic residue" (Schwarcz and Schoeninger 1991:292). The freeze-dried organic residue was placed in a Cu, CuO Ag foil, evacuated and sealed. It was then combusted in a muffle furnace at a temperature between 850–875°C for about three hours before being left to cool down for approximately 15 hours. The combustion process converts the organic residue to H_2O (water), CO_2, and N_2. Water was removed by cryogenic distillation, while N_2 was recovered using a toepler pump to prevent nitrogen from fractionating.

TRENDS

A total of 44 samples were processed for stable isotope analyses, although organic residues could be extracted in only 24 specimens (table 4.1). The remainder of the samples either yielded amounts of residues that were insufficient for analysis, or, as in some cases, their C/N ratio was too high to be accurate; the analysis was also excluded for suspected contamination by C_3 humic acid (cf. Ambrose 1993). In six instances, the procedure was replicated. Of these, three samples still did not provide sufficient quantities of organic material; the other three returned very similar, coherent results (Burial 3, Burial 15A, and Burial 27) and therefore were counted within the group of reliable results. Last, Burial 24-2 and Burial 24-3 were sampled twice. In both cases, one of the fragments had been previously consolidated; the other one had either been left without treatment (Burial 24-3) or the information concerning possible consolidation was unclear to us (Burial 24-2). In both cases, results are consistent with each other, indicating that the consolidation process had not affected the chemical outcome. The resulting values of the overall sample are listed in table 4.1. Given the concordance between the original analysis and its replicate, the original data will be used in the following section of the results. For Burials 24-2 and 24-3, we took into consideration only the results obtained from processing nonconsolidated fragments.

The scatterplot distribution for $\delta^{13}C$ (horizontal axis) and $\delta^{15}N$ (vertical axis) for the 24 specimens is represented in figure 4.1 with respect to geographical provenience (based on Sr and O isotopes) and in figure 4.2 with respect to sex. Unsurprisingly, a general view of the $\delta^{13}C$ and $\delta^{15}N$ scatterplot indicates that C_4 plants represent the main crop consumed by locals, identified most likely by maize, with the exception of Burial 2, located in the lower left corner of the bidimensional scatterplot (figure 4.1). Burial 2 is seemingly characterized

TABLE 4.1. Stable isotope composition of the specimens from which organic residue could be extracted.

BURIAL #	AGE	SEX	WEIGHT % COLLAGEN	WEIGHT % N	δ15N	WEIGHT % C	δ13C	ATOMIC C:N
Burial 1	Child	—	13.69	5.39	8.796	14.25	−8.127	3.08
Burial 2	MAd	F?	0.64	2.93	5.790	8.24	−14.850	3.28
Burial 3	Adult	—	6.29	15.05	7.875	41.76	−9.393	3.24
Burial 3	Adult	—	6.29	14.95	7.965	41.19	−9.372	3.21
Burial 6A	YAd/ MAd	M?	2.25	9.60	9.370	26.48	−11.295	3.22
Burial 7	YAd/ MAd	M?	1.59	6.06	8.002	16.70	−9.684	3.21
Burial 8	MAd	F	2.16	11.83	8.089	32.59	−8.924	3.21
Burial 9	Child	—	1.91	9.73	8.575	26.32	−8.881	3.16
Burial 10	Adol	F?	26.98	16.28	9.354	43.96	−8.846	3.15
Burial 11	Adult	F?	1.32	9.93	7.903	26.79	−8.487	3.15
Burial 15A	YAd	M	1.73	12.25	8.788	33.55	−9.095	3.19
Burial 15A	YAd	M	1.73	11.91	8.599	32.45	−9.058	3.18
Burial 15B	Adult	F?	1.36	8.93	8.680	24.18	−9.265	3.16
Burial 16	Adult	M?	1.78	11.16	7.924	30.76	−10.279	3.22
Burial 18A	Child	—	2.37	8.10	8.482	22.38	−9.163	3.22
Burial 20	OAd	F	0.55	2.63	8.245	7.32	−10.148	3.25
Burial 21	Adult	—	2.97	3.59	8.347	10.40	−11.610	3.38
Burial 24-1	YAd	F?	1.71	7.91	7.695	21.79	−9.038	3.22
Burial 24-2	Child/ Adol	F?	1.54	8.57	7.682	23.76	−10.957	3.23
Burial 24-2 IE	Child/ Adol	F?	4.08	12.10	7.485	33.29	−10.723	3.21
Burial 24-3	Child	—	2.55	10.74	7.662	29.34	−8.365	3.19
Burial 24-3 IE	Child	—	5.01	8.77	7.262	24.14	−8.851	3.21
Burial 24-4 IE	Adol	M?	1.81	8.85	7.499	24.10	−10.151	3.18
Burial 24-6 IE	Adol	F	1.18	7.77	8.043	21.13	−9.499	3.17
Burial 24-10	Adol	F?	4.08	11.00	7.361	30.19	−9.788	3.20
Burial 25	YAd	F?	9.99	9.50	8.166	25.79	−9.696	3.17
Burial 27-11CR IE (27-2)	Adol	F?	10.38	14.20	9.233	38.78	−7.957	3.19
Burial 27-11CR IE (27-2)	Adol	F?	10.38	14.12	9.143	38.44	−7.916	3.18
Burial 27-11 (27-1)	YAd	M	23.53	14.74	9.357	39.79	−7.815	3.15

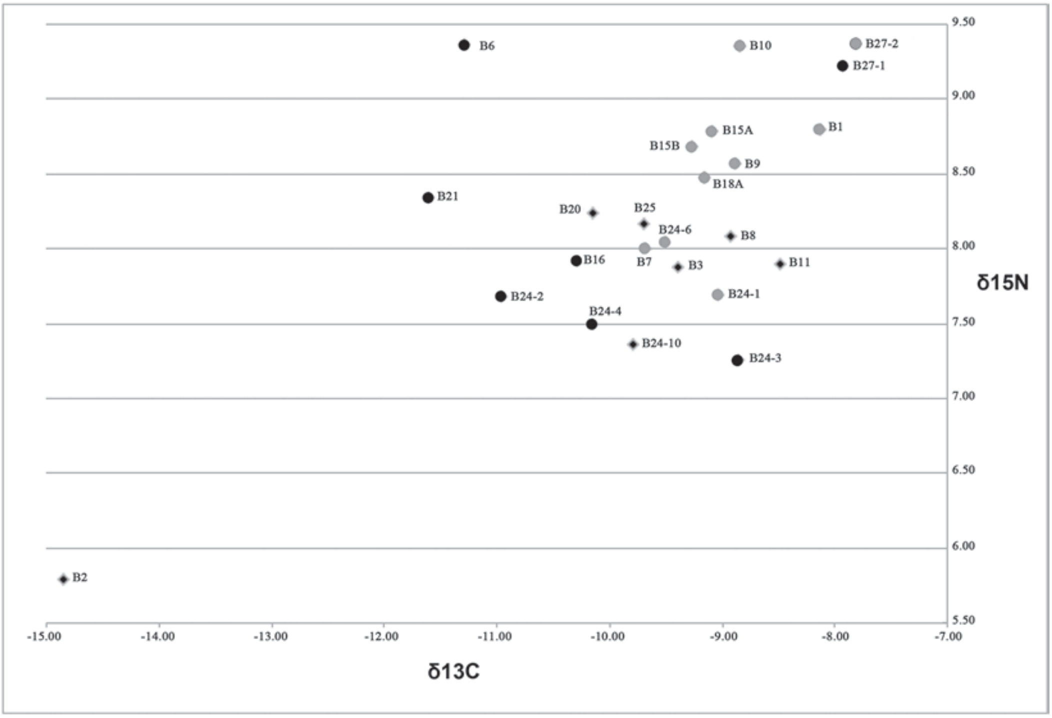


FIGURE 4.1. Scatterplot of the δ13C and δ15N stable isotopes. Black dots indicate nonlocal individuals based on Sr isotope ratio, gray dots indicate locals. The remaining individuals lack Sr evidence.

by a CAM diet ($\delta^{13}C = -14.850$) and represents a clear outlier in the carbon distribution of the whole sample.

Table 4.2 shows the average values (and standard deviations) of $\delta^{13}C$ and $\delta^{15}N$ ratios for the whole population, by sex, place of origin, and chronological phases (II v. III–IV). Regarding the $\delta^{15}N$ ratios, only minor differences can be gleaned by examining the individuals by place of origin, with locals averaging 8.588 versus 8.232 for nonlocals. By sex there are also minor differences: females average 8.020 when Burial 2 is included, but their average increases (and standard deviation decreases) when Burial 2 is excluded, making the ratio much more similar to the males one (respectively 8.223 for females and 8.490 for males). Comparing the individuals by chronological phases, however, presents more marked differences; the individuals from Yaxuná II average 7.657 (with a low level of variability), while the rest of the sample (which belongs to phase III–IV) averages 8.388 (statistical differences will be discussed further ahead). The chronological comparisons must be taken with caution as all the Yaxuná II individuals come from high-status contexts.

As far as $\delta^{13}C$ is concerned, locals seem to be characterized by a diet more heavily based on C_4 plants. This contrasts with nonlocals, whose ratio (-10.082) puts them toward the boundaries with CAM plants. In terms of comparing the individuals by sex and chronology, we noted only minor differences. Figure 4.1 shows that the range of variation is most

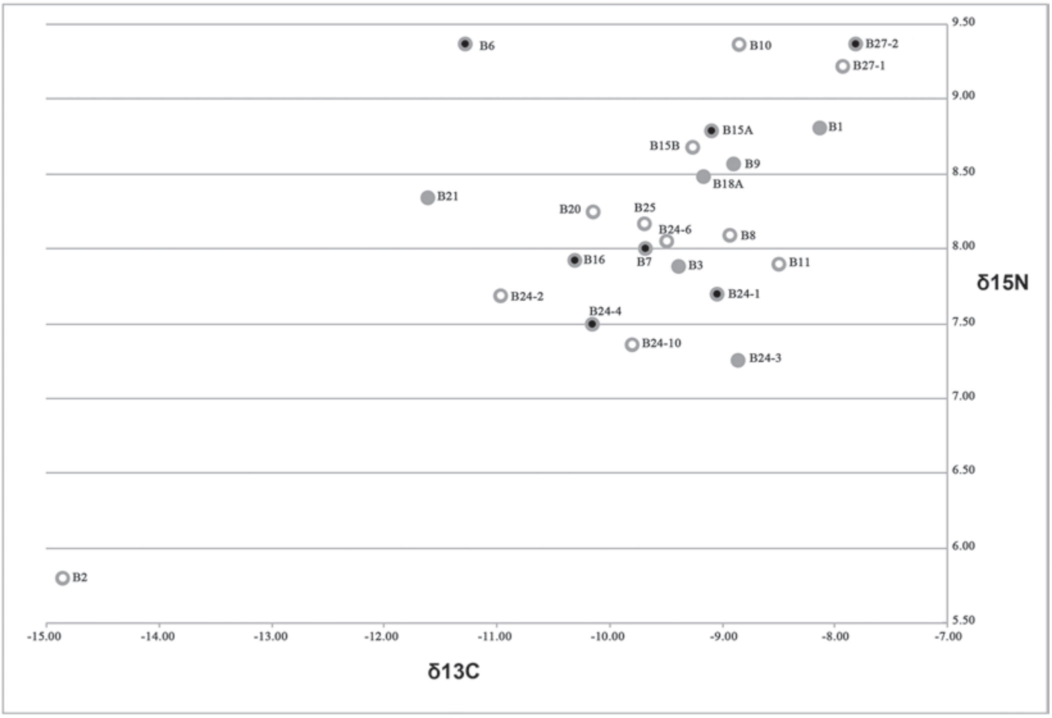


FIGURE 4.2. Scatterplot of the δ13C and δ15N stable isotopes by sex. Black dots on gray background indicate males, white-on-gray indicates females. All-gray dots indicate individuals of undetermined sex.

restricted among the locally born individuals, an expected result. Their $\delta^{13}C$ values range roughly between −10.5 and −8.0 and their $\delta^{15}N$ results fall between the values of 7.5 and 9.0. These ranges are quite similar to those found in other settlements in the Maya lowlands, such as Piedras Negras, Altar de Sacrificios, El Kinel, and Dos Pilas (Scherer 2015:25; Wright 2006:193). The overall picture is that meat seems to have been rarely consumed among the sampled individuals from Yaxuná or, alternatively, they preferably ate the meat of animals, which during life had satisfied parts of their food intake with C_4 milpa crops. Lori Wright (1994, 1998, 2006) makes a similar argument to account for the wide $\delta^{13}C$ ranges she encounters in local deer specimens from the Río de la Pasión area.

More specifically, the $\delta^{15}N$ values show a notable reliance on herbivore proteins among more than half of all represented individuals. Unsurprisingly, the data also indicate that their diet rarely, if ever, consisted in consumption of second-level carnivores or marine resources. This conclusion was also reached by Mansell and her colleagues (2006), who conducted work on stable isotopes among Yaxuná's population a decade ago. Their results, however, were numerically more reduced (N = 3), and two of the three values from this series were obtained from individuals that are not part of the present study (Burial 17 and Burial 24-12). The isotopic averages obtained by Mansell and her colleagues (2006:175) fall slightly below

TABLE 4.2. Average values and standard deviations of $\delta^{15}N$ and $\delta^{13}C$ ratios in the total sample, by sex, place of origin, and chronological phases.

		$\delta^{15}N$	$\delta^{13}C$
Total	Mean	8.205	−9.638
	s.d.	0.792	1.485
	N	24	24
Locals	Mean	8.588	−8.917
	s.d.	0.582	0.606
	N	9	9
Non-locals	Mean	8.232	−10.082
	s.d.	0.753	1.429
	N	7	7
Males	Mean	8.490	−9.720
	s.d.	0.794	1.183
	N	6	6
Females	Mean	8.020	−9.788
	s.d.	0.925	1.777
	N	12	12
Females*	Mean	8.223	−9.328
(*data without B2)	s.d.	0.631	0.823
	N	11	11
Phase II	Mean	7.657	−9.633
	s.d.	0.230	0.897
	N	6	6
Phase III–IV	Mean	8.388	−9.640
	s.d.	0.832	1.657
	N	18	18

the ones obtained in our own scrutiny of $\delta^{13}C$ (−12.3 v. −9.638 for the whole sample) and $\delta^{15}N$ (7.1 v. 8.205), which we hold to be an artifact of the small sample size. Note that the apparent lack of local seafood and fish consumption diverges from a more visible intake of marine resources at nearby Chichén Itzá, as has been demonstrated by faunal analyses of some of Chichén Itzá's Terminal Classic contexts (Götz and Stanton 2013). Such faunal remains are conspicuously absent at Yaxuná.

The faunal data recovered at Yaxuná puts into context the local dietary signature reflected in the stable isotopes. Primarily, animals such as deer and peccary are found in the middens of the site, while secondary carnivores and evidence for marine foodstuffs are largely absent

(Götz and Stanton 2013). The comparison with Wright's (2006) data shows that $\delta^{15}N$ distribution is more restricted in the samples from Yaxuná (between 7.2‰ and 9.4‰) when compared to the urban centers of Río de la Pasión at the southern extreme of the Maya lowlands, where values range as much as 12‰. This diversity in dietary signals has been interpreted by a number of authors (Scherer et al. 2007; Wright 2006) as a sign of change toward the close of the Classic period and as a marker of social distinction (with higher intake of animal protein). Unfortunately, we could not verify any socially driven trends for Yaxuná, as the two royals of Early Classic dynasty (Burial 23 and the Burial 24-14 cremain), did not yield sufficient sample amounts.

We then compared the $\delta^{13}C$ and $\delta^{15}N$ results by sex, place of origin, and archaeologically inferred class, as well as by assessing whether they changed by chronological period. Among women and men, we found a relatively homogeneous diet with the only exception of Burial 2 (see also table 4.2). No differential isotopic pattern indicates any collective difference between male and female food choice (figure 4.2). On the contrary, female and male values are equally distributed within the range of variability of both $\delta^{13}C$ and $\delta^{15}N$, suggesting, at least in our relatively small sample, that there were not substantial differences in diet based on sex. The Mann-Whitney U test for $\delta^{13}C$ and $\delta^{15}N$ shows no significant differences between sexes for both $\delta^{13}C$ and $\delta^{15}N$ (respectively $p = 0.786$ and $p = 0.651$). The general, overall results are consistent with the ratios reported by Gerry and Krueger (1997), who analyzed carbon and nitrogen ratios in a series of sites and regions within the Maya realm. The means of both $\delta^{13}C$ and $\delta^{15}N$ at Yaxuná fall within the range encountered by the authors, who interpreted the parity as the product of a diet intensively based on maize (for carbon) and at the same time lacking seafood and other marine resources (based on nitrogen).

In a further approach, we put the results of $\delta^{13}C$ and $\delta^{15}N$ in context with the corresponding local or foreign provenience, as indicated by Sr isotope ratios. As mentioned, locally born people tend to be clustered around intermediate values for both $\delta^{13}C$ and $\delta^{15}N$ (figure 4.1), while foreign-born individuals tend to be more widely distributed around the central core of values. Regarding carbon isotopes, Burial 6, Burial 16, Burial 21, Burial 24-4, and Burial 24-2 are situated at the lower end of the distribution range, indicating diets not as heavily relying on maize but more reliant on C_3 plants, such as squash and beans. In turn, regarding $\delta^{15}N$, Burial 24-3 and Burial 24-2 (both from the Early Classic multiple burial) are the predominant C_4 (maize) consumers.[1] Last, Burial 27-1 and Burial 6 (both males) appear at the top of the trophic chain (together with Burial 10, a local female). It does at least appear that there is a more homogeneous profile for a local Yaxuná diet, although we are hesitant to draw any wider conclusion, as working with such a small sample size makes sweeping generalizations highly speculative. A Mann-Whitney U test for $\delta^{13}C$ and $\delta^{15}N$ between foreigners versus locals does not reach significant thresholds for this very reason ($\delta^{13}C$ and $\delta^{15}N$ respectively $p = 0.088$ and $p = 0.233$).

Regarding social class, as implied by burial location and grave goods, we compared the data from the Early Classic tombs (all from Burial 24 as we did not recover $\delta^{13}C$ and $\delta^{15}N$ from Burial 23) and Burial 25 (a well-prepared Terminal Classic crypt in Str. 6F-68) with the remainder of the burials at Yaxuná, none of which show any distinctive burial accoutrement indicative of the elite class. Burial 21 comes from a tomb context but was not placed in a prepared crypt and was devoid of grave goods. Burials 26 and 27 were located within the North Acropolis but were recovered from a midden deposit. All other burials came from nonelite domestic contexts.

Interestingly, given their position in the scatterplot, all the individuals from the central burial cohort tend to signal relatively low $\delta^{15}N$ values, indicating a diet less based on meat, or at least on secondary carnivores, although Coyston and her colleagues (1999; using data from the Maya site of Pacbitún in Belize) note that it is the type of meat and not the amount of meat ingested that distinguishes elite versus commoner diets. Data from sites such as Lamanai, a settlement in Belize, indicate higher $\delta^{15}N$ values among the elite than among nonelite individuals. Returning to Yaxuná, the isotopic evidence clearly indicates that the well-to-do segment of the population consumed significantly much less meat than the other individuals (Mann-Whitney U test, $Z = 2.731$, $p = 0.006$); their range of variability for $\delta^{15}N$ is also much lower than at other sites (White et al. 1989, 1993), regardless of status. Overall, meat appears to be less important in the local diet than among other documented sites from the Maya lowlands.

More challenging are our efforts to understand how the $\delta^{13}C$ and $\delta^{15}N$ values evolved over time. Our sample spans three periods; Yaxuná II (Early Classic, only from royal tombs), Yaxuná III (Late Classic), and Yaxuná IVa (early part of the Terminal Classic). Unfortunately, we were unable to extract $\delta^{13}C$ and $\delta^{15}N$ from more than a few individuals dated to the Late Classic. In fact, of the burials with isotopic dietary evidence, only Burial 1, Burial 20, and Burial 27-1 may date to the Late Classic, and the former two are not as securely dated as we would like. This may be an artifact of poor preservation of Late Classic burials in general, which owes to the lack of formal crypts during this period; this likely exposed the bone material to the acidic soils common across the northern lowlands, leading to relatively rapid deterioration. In any event, we are left with only two periods to compare. Yet the burials from each period come from different types of contexts; royal tombs for the Early Classic and generally domestic burials for the Terminal Classic.

With this issue in mind, the stable isotopic values do suggest distinctive trends between these two periods of occupation, both for $\delta^{13}C$ and, more so, for $\delta^{15}N$ (figure 4.3). As for carbon isotopes, those individuals belonging to the Early Classic for whom we have reliable isotopic data are concentrated between −9 and −11, with Burial 24-1 showing the highest $\delta^{13}C$ value for this chronological phase. On the contrary, the Terminal Classic individuals tend to be spread within the whole range of variation of $\delta^{13}C$. Although all of them cluster within the range of C_4 plants (maize), the Early Classic individuals in the tombs do seem to be characterized by a less diversified diet. Such difference can be appreciated more clearly when only $\delta^{15}N$ values are considered. For $\delta^{15}N$, the Early Classic individuals occupy the lowest range of variation, all of them within the range of the values of 7.26 and 8.04. They share this range with four individuals from the Terminal Classic.

Last, the majority of the Terminal Classic individuals ($N = 13$) fall within the range that goes from 8.089 to 9.37. Taking into consideration the status differences outlined above, the

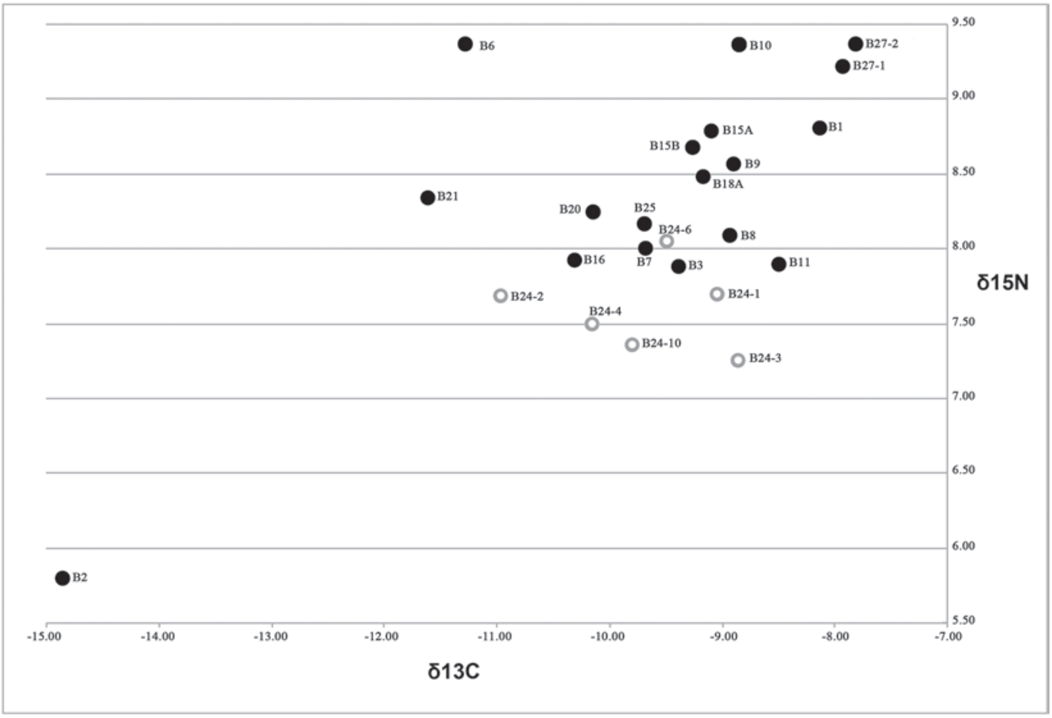


FIGURE 4.3. Scatterplot of the δ13C and δ15N stable isotopes by chronological phase. White-on-black dots indicate individuals dated to phase II, black dots indicate phase III–IV.

question remains whether the less diversified diet of the individuals from the Early Classic tombs had to do more with lifestyle or with the period in which they lived and died. While it is difficult at present to find satisfactory answers to this question, we do know that the Terminal Classic was a time of overpopulation, possible droughts, and resource stress (Webster 2002). The diversified diets of this later period may therefore be due to people resorting to other food resources in times of contingency and food crises, potentially focusing their subsistence efforts less on cultivated crops and relying more on C_4-fed animals (like peccary and turkey) rather than on C_3-fed wild animals like deer. Similar interpretations have been advanced by Wright (2006:194) and by Scherer and colleagues (2007) regarding the apparently more diversified food sources of western lowland Maya during the Terminal Classic, who arguably had renewed access to faunal resources of freshly regrown forests, well past the population peaks in this area.

In general terms, however, the overall local variability of the Yaxuná series is among the lowest in terms of carbon and nitrogen ratios when compared to other lowland sites, or others from outside the Maya sphere, such as Teopancazco, an Early Classic urban neighborhood at Teotihuacan in the Mexican highlands (figure 4.4). Moreover, Yaxuná is the lowest one in terms of $\delta^{15}N$, with an average value slightly above 8, which indicates once more a lower amount of animal protein in the diet.

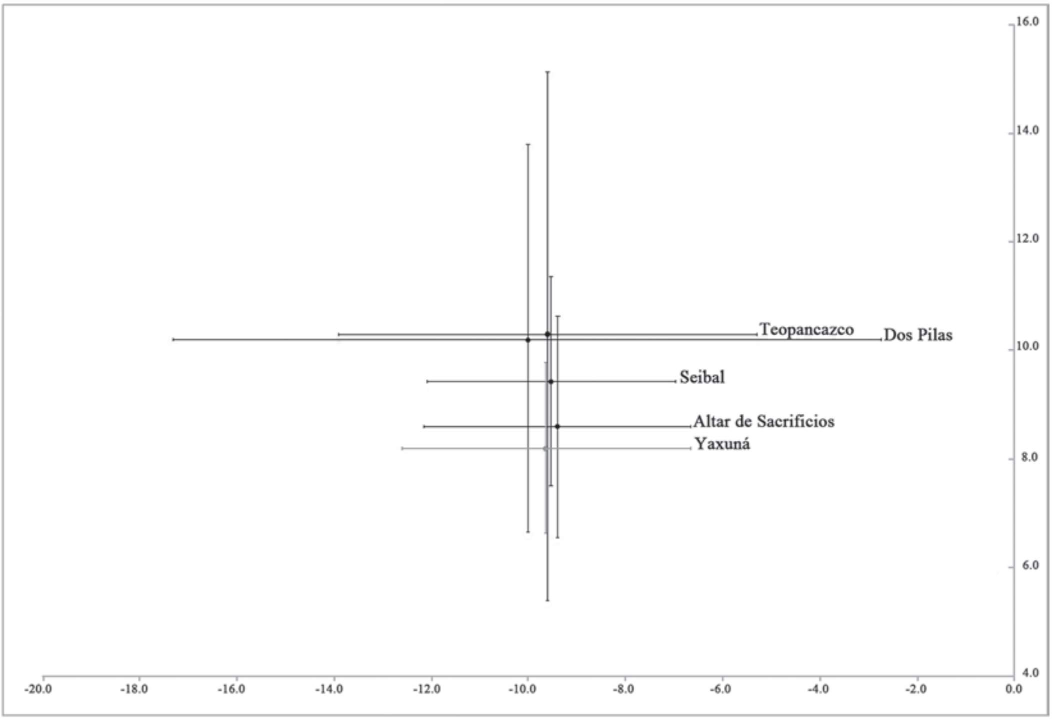


FIGURE 4.4. Comparative distribution of δ13C and δ15N stable isotopes' variability between Yaxuná and other pre-Hispanic contexts (data from Wright 2006; Morales et al. 2012) .

FOOD PROCESSING AND CONSUMPTION

Food access and choice depend largely on subsistence patterns. In sedentary societies, the dietary consumption depends largely on the cultivated or domesticated food staples, such as beans, squash, and maize among Mesoamericans. Likewise, the preparation of these staples, properly the cuisine of a given area, according to which food is processed, spiced, and combined with secondary food sources is culturally guided, usually gendered, and identity forging. While material implements such as ceramic vessels and *manos* (pestles) and *metates* (mortars) may provide indications regarding food processing and consumption, here we focus primarily on the dentitions of Yaxuná's inhabitants.

DENTAL WEAR

The effects of food choice and form of consumption becomes apparent in the dentition when we consider physiological wear patterns along the path of human evolution and the advent of sedentary life, the latter of which lead to a noticeable reduction in dental wear in most societies, paralleled by food processing (Brothwell 1987; Larsen 1985; Williams and Woodhead 1986). Occlusal dental wear is defined by the loss of dental substance as the consequence of friction between food matter and the upper and lower dental arches during mastication.

The advance of dental wear is mitigated in the individual by the formation of secondary dentine, but cannot be reversed. As the person ages, the progressive loss of dental substance is countered by the organism, first by creating dentine patches on the occlusion surfaces of the dental arcade. These facets expand and turn into occlusal wear platforms as the wear advances and reduces the overall tooth height until the tooth falls out or is worn down to its root(s) (Molnar 1971). Slight differences between the pace of maxillary and mandibular wear are noted between age groups. Dental wear advances relatively fast in young adults, but then slows down during middle and mature adulthood (Hillson 1986:185).

In the premodern past, dental wear was often induced by using the dentition as a tool, required during quotidian tasks such as leather chewing, basket making, or carpentry (Larsen 1985; Milner and Larsen 1991; Ubelaker 1989). Yet wear from processing food was more common. Edible matter, in contact with the dental arches, came to gradually reduce the enamel that coated the dental piece as it was processed by chewing. Dietary dental wear, therefore, depends greatly on the type of foodstuff being consumed habitually and the form of its intake. For instance, unprocessed, fibrous aliments have a greater abrasive effect on the dentition than food staples consumed in a processed form, such as mechanical grinding, boiling, or roasting (Larsen 1997; Molnar 1971).

The result of diet-induced dental abrasion has been evaluated extensively in physical anthropology, using both macro- and microscopic methods. Moreover, it has served as a secondary indication of adult age-at-death and subsistence patterns (Brothwell 1987; Hillson 1986; Larsen 1997; Mays 1998; Molnar 1971; Walker and Hewlett 1986). In the following paragraphs, we shall take up a number of questions regarding consumption profiles and eating habits in order to place Yaxuná's population within the culinary Maya landscape.

PROCEDURES

We scored all teeth of Yaxuná's residence population macroscopically, using taxonomies based on the progression of dental facets and overall tooth reduction. Among those, we found the first permanent molars more suitable for approaching dietary choice and food consumption patterns. The broad, horizontal occlusal surface of first molars (and molars in general) and their grinding function tend to result in a more even distribution of dental wear. The first permanent molar, which fully erupts around the age of seven or eight, is also an excellent tooth segment for considering wear.

Table 4.3 describes the taxonomy developed by Brothwell (1987) and adapted for this study to suit the general 0–3 scale employed for skeletal features (see also Hillson 1986).[2] The resulting values were noted for each molar and then averaged bilaterally and according to upper and lower jaw. A final, pondered score was used in all subsequent data processing. As dental wear is roughly age dependent, we proceeded by representing the collective average scores as progression lines according to age range (on the x-axis). For this purpose we used all

TABLE 4.3. Degrees of occlusal wear on the first permanent molar (Tiesler 1999, 2000a).

DEGREES OF WEAR	OF BROTHWELL (1987)	COMMENT
0	"1" "no wear"	No signs of dental wear
0.5	"2" "enamel only"	Wear facets are still limited to the enamel
1	"3"	Wear facets involves the dental cusps displaying patches of dentine
1.5	"3+"	Large patches of dentine shown (in the form of islands)
2	"4+"	Formation of secondary dentine. The attritional exposure has reached half the crown
2.5	"5+"	Dental attrition exposes the dentin in more than half of the occlusal surface. Ample formation of secondary dentine
3	"5++" "down to neck"	Dental wear has worn off most or all of the dental crown

preserved Classic period skeletons from Yaxuná above the age of ten and used only individuals with an assigned age range.

In a subsequent step, we compared the average age-progressing wear rates from Yaxuná with those previously scored in skeletal series from the area. The latter have been pulled from a regional database, which includes dental wear scores, measured systematically by one of the authors (V. T.) by using the above described procedures and taxonomy. Contextual information for each individual included chronological range, location, site centrality [1–4], and a set of correlates for social distinction as inferred from the burial attire when undisturbed. The relevant status markers include the presence of tomb architecture, and inclusions of cinnabar and artifacts made of exotic materials, such as jadeite or obsidian (Krejci and Culbert 1995; Tiesler 1999:106). A composite score was indicated in a range of 0 (lowest) to 5 (highest).

TRENDS

In our local series, some 18 individuals aged ten or beyond were sufficiently preserved to be evaluated for dental wear. Despite the reduced sample size, the collective wear progression appears relatively uniform and falls slightly short of the graphs drawn for similarly aged inland and coastal Yucatecans beyond the age of ten (table 4.4. and figure 4.5). No significant discrepancies were noted between the sexes; women displayed a similar abrasion progression when compared to males, although no generalizations may be advanced due to the reduced sample cohort. It appears, however, that the dental wear of locals, including the mature individuals, did not involve extensive cusp and tooth reduction in their first molars, although

TABLE 4.4. Average dental wear in first permanent molars among the local population of Yaxuná and regional comparison.

AGE CATEGORY	YAXUNÁ* [N]	YUCATECAN INLAND* [N]	YUCATECAN COAST* [N]	MAYA LOWLANDS*,**	MAYA HIGHLANDS
10.1–20	0.30 [5]	0.38 [14]	0.58 [47]	0.45 [17]	0.43 [15]
20.1–30	0.58 [3]	0.67 [11]	0.78 [66]	0.71 [40]	1.49 [5]
30.1–40	0.97 [7]	1.27 [6]	1.17 [62]	1.11 [27]	1.54 [4]
> 40	0.92 [6]	1.48 [10]	1.46 [70]	1.50 [51]	1.94 [11]
Average	0.74 [21]	0.87 [41]	1.03 [245]	1.06 [135]	1.17 [35]

*Only individuals with age range and dated to the Classic period were included.

**Only sites of the central and northern lowlands were included.

the diversity of wear degrees does increase with age. Apart from the diversity of individually accrued dietary histories, wear discrepancies among elderly individuals are most probably due to the fact that, beyond the age of 40, many teeth fall out of their sockets and the gaps in the dental arch generate irregular wear degrees and patterns among the remaining teeth. This trend, however preliminary, appears to differ somewhat from the regionally drawn conclusions by Tiesler (1999:276) and Chi (2006; Chi et al. 2007), who found female wear progression to be more pronounced than in similarly aged males.

When compared to other skeletal populations beyond the region, the noticeable lack of wear among Maya lowland populations stands out by itself, a question that has been scrutinized systematically on a regional level by Tiesler (1999, 2000a) and by Scherer, who find that the inhabitants of the Maya lowlands display significantly lower dental abrasion degrees than other agricultural societies of the past (Scherer 2015:42). In our present coverage of pre-Hispanic dental abrasion, Yaxuná's wear progression starts out like that of its lowland neighbors, but advances more rapidly, resulting in flattened and reduced molar surfaces already among the middle-aged adults. As subsistence should be similarly based here and there on maize, we assume that the discrepancy should be sought in the grinding materials such the *metates* used to grind the maize into flour (introducing extrinsic mineral particles into the ingredients) or differences in the nixtamalization (lime addition) process during corn preparation. It could be the case that the limestone *metates* available to Maya in the lowlands were less likely to leave abrasive particles in the flour than grinding stones made out of basalt, which are commonly used in the volcanic highland areas to the south. Tiesler has documented noticeable higher dental abrasion rates in highland populations from southern Mexico, Guatemala, and down to Costa Rica.

While we believe this to be the most likely reason for the low wear patterns in the lowlands, we acknowledge that there may have been important differences in food preparation that should also be considered in future work, as noted by Tiesler (2000a). For example, iconographic depictions and epigraphic references to maize-based food in the lowland Maya area

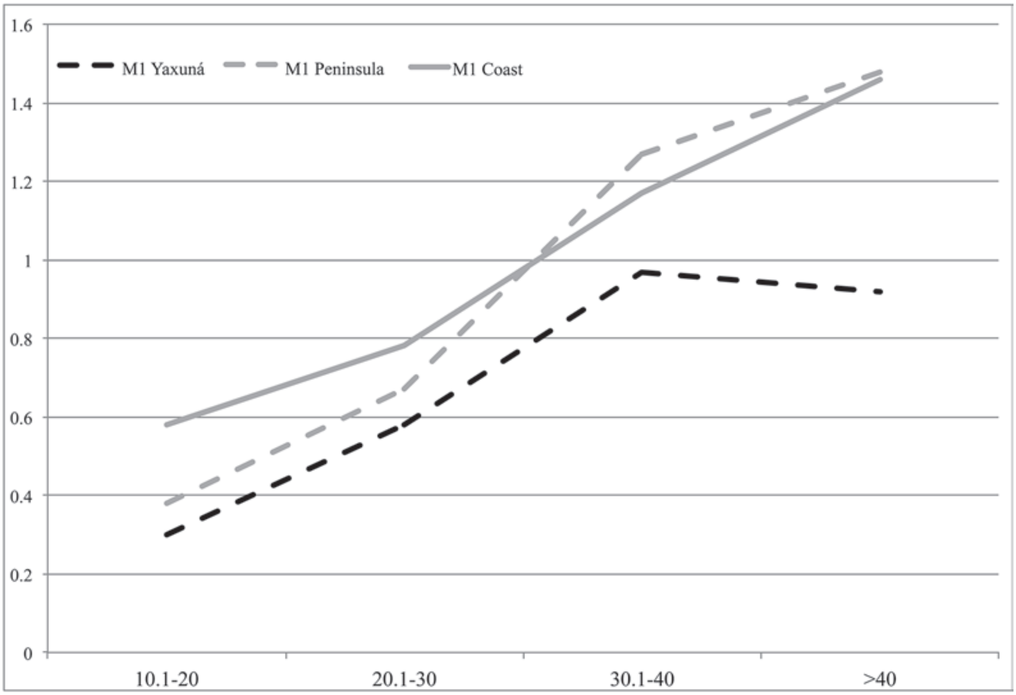


FIGURE 4.5. Average dental wear progression according to estimated mean age in first permanent molars among the local population of Yaxuná and regional comparison.

during the Classic period are often related to tamales or *atole*, a maize-based gruel. However, in other areas of Mesoamerica, including certain periods for the Maya highlands, *comales*, or tortilla toasters, are common. These artifacts are virtually absent in the Maya lowlands during the Classic period, indicating important differences in the way the lowland Maya prepared maize in comparison to many of their neighbors. These differences may have also had some impact on dental wear, but only future experimental work will resolve this question.

Previous area-based research has also shown a gradual reduction of Maya dental wear rates from the Formative toward the Postclassic (Tiesler 1999). This trend is most apparent when the Formative period skeletal series are compared to those dated to the first millennium AD (Chi and Tiesler 2009; Saul and Saul 1997; Tiesler 2000a). This drop in wear suggests that the Maya consumed a progressively blander diet toward and during the heydays of their Petén hegemonies. Among the Classic Maya themselves, dental wear analyses have been designed to approximate more general subsistence patterns, such as urban versus rural consumption, and social status (Chi 2006; Chi and Tiesler 2009; Saul and Saul 1997; Scherer 2015:42; Tiesler 2000a). Several studies have concluded that lingual abrasion of the maxillary incisors is the consequence of habitual ingestion of highly fibrous vegetables (Irish and Turner 1993; Saul and Saul 1991). The authors interpret this as a sign of a largely vegetarian diet rich in carbohydrates with cariogenic predisposition.

TABLE 4.5. Average dental wear in first permanent molars among the local population of Yaxuná and regional comparison according to social sector and settlement centrality.

AGE CATEGORY	YAXUNÁ* [N]	LOWLANDS CENTRAL** [N]	LOWLANDS PERIPHERY** [N]	LOWLANDS LOW [0,1]* **	LOWLANDS HIGH [2–5]**
10.1–20	0.30 [5]	0.30 [10]	0.40 [16]	0.34 [7]	0.41 [2]
20.1–30	0.58 [3]	0.88 [11]	0.75 [15]	0.86 [12]	1.46 [3]
30.1–40	0.97 [7]	1.00 [14]	1.60 [9]	1.43 [10]	0.80 [5]
> 40	0.92 [6]	1.43 [22]	1.90 [13]	1.73 [14]	1.21 [12]
Average	0.74 [21]	0.96 [57]	1.05 [53]	1.20 [43]	0.95 [22]

*Only individuals with age range and dated to the Classic period were included.

**Only sites of the central and northern lowlands were included.

Taken together, the data on dental wear, although complex in their origins, provide a rich corpus of information to discuss scenarios for local and regional habits of food preparation and consumption. As table 4.5 and figure 4.6 show, the average dental wear in first permanent molars from Yaxuná gets close to that found in big-site urban populations (rank 1 sites) from the area more than rural hamlets (rank 3 and 4 sites; see Garza and Kurjack 1980 for rankings). The latter show consistently higher abrasion rates than their more centrally located neighbors. This by itself is noteworthy, as it conveys that the urbanized Maya set themselves apart from the countryside by their foodways and therefore lifeways. Of course, we can only speculate about the more subtle differences in cuisine and diet with this information at hand.

Urbanization seems to have had a diminishing effect on dental wear rates and social status, pushing the above correlation still further—that is, low abrasion from still-softer food staples and a higher degree of food processing (table 4.5 and figure 4.7). Apart from the choice of food staples and maize preparation, heat processing and serving should have also had an influence on dental wear among the more well-to-do by reducing the abrasive effect of comestibles during ingestion. Many of the known foods used by the Classic Maya, such as *atole*, cacao drinks, and tamales, were heated. These appear inscribed or rendered on refined painted vessels and walls (Beliaev et al. 2010).

Elaborating on this last point, we singled out a number of historically known rulers who displayed extraordinarily unworn dentitions in comparison to other individuals (figure 4.8a). Such is Janaab Pakal of Palenque, who showed no more than delimited facets at the time of his death at the advanced age of 80 years. Still more reduced is the dental wear of Yuknoom Yich'aak K'ahk', Calakmul's overlord, who probably died in his early fifties. His dentition was barely worn at all. Still younger was Lord Sky Witness from Dzibanché (figure 4.8c), whose dental wear did not even reach the dentin underneath the enamel at the time of his passing in his early thirties. Yet what about the lord from Burial 23 at Yaxuná? In his forties, this lord did show extensive wear and tooth reduction: large patches of dentine had formed on the

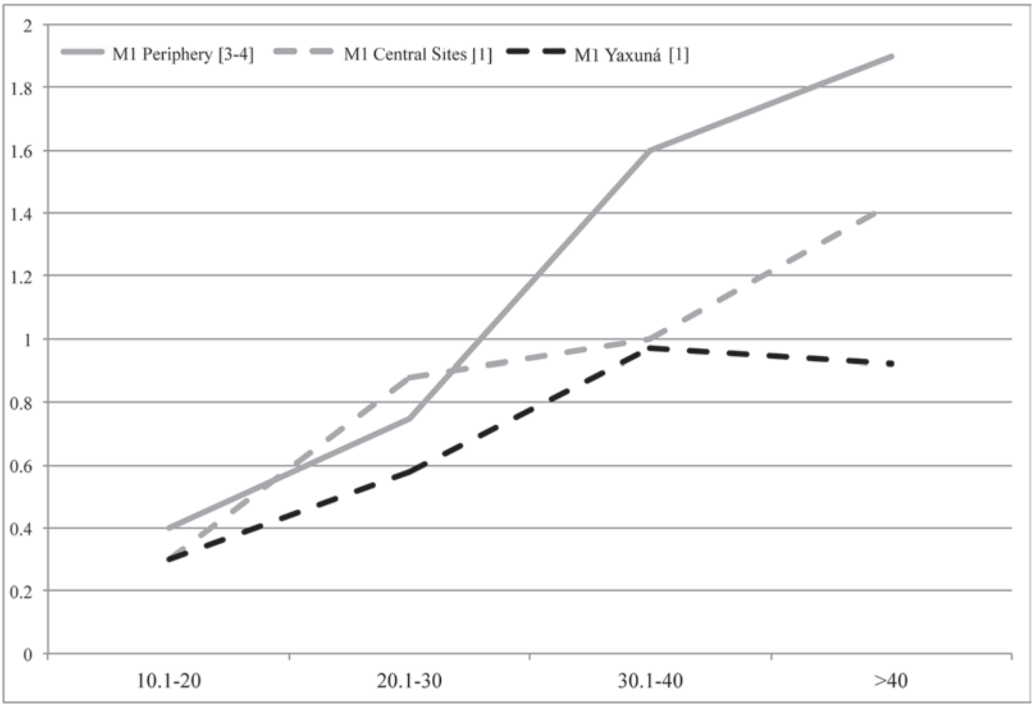


FIGURE 4.6. Average dental wear in first permanent molars among the local population of Yaxuná in comparison with rural and central lowland settlement populations.

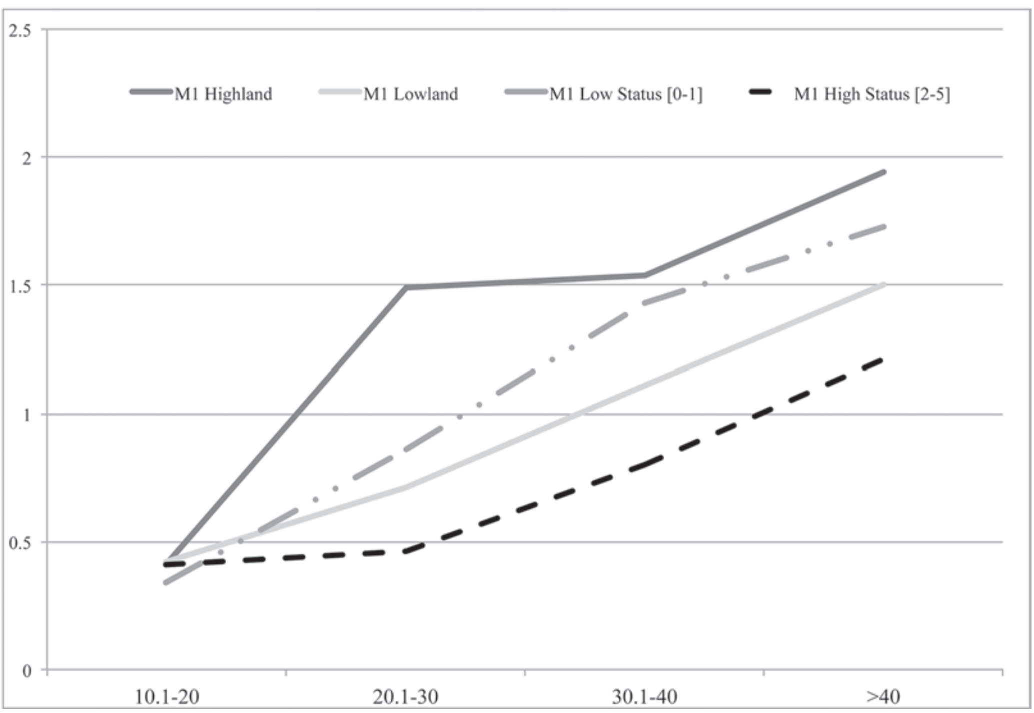


FIGURE 4.7. Average dental wear in first permanent molars among the local settlers of Yaxuná in comparison with highland and lowland settlement populations according to status.

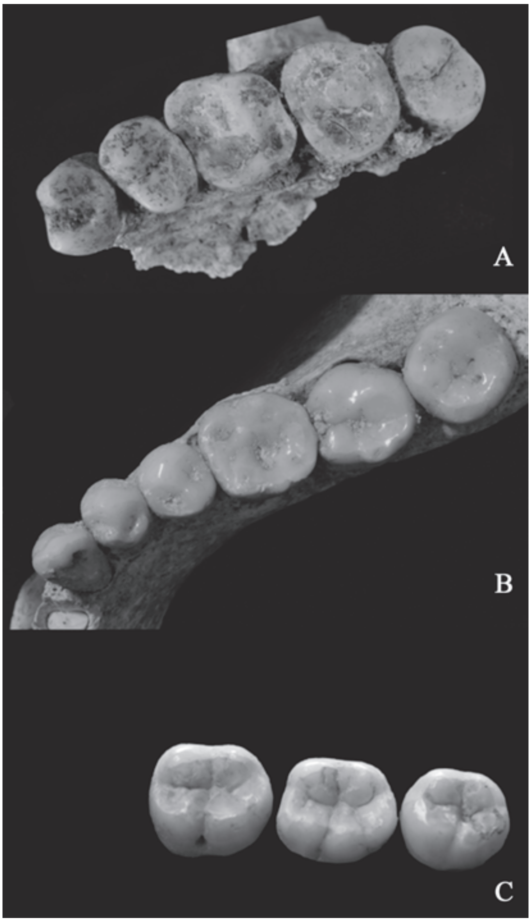


FIGURE 4.8. Dental wear of permanent molars: (a) highly worn maxillary molars from Highland Kaminaljuyu (N6896.3, Peabody Museum); (b) mandibular molar cusps of the noble occupant of Burial 23, Yaxuná, displaying extended wear facets on first molar (Yaxuná, Selz Foundation); (c) practically unworn mandibular molars of Lord Sky Witness from Dzibanché (aged 30–35) (Burial E2-South, Proyecto Sur de Quintana Roo/INAH) (photos by V. Tiesler).

occlusal surfaces of his molars (figure 4.8b), the cusps had been worn down, and the crown looked slightly reduced in height. This case demonstrates the variability among individual values and prescribes caution when generalizing matching dental wear and social status causally, a topic to be taken up again in chapter 7.

IMPLEMENTS FOR FOOD PROCESSING

While our interpretations are based primarily on the dental data, we do have some relevant information at hand concerning food preparation and consumption from the artifact inventory from Yaxuná. As previously mentioned, the ancient people of Yaxuná consumed a diet that revolved around maize. Therefore, we would expect to find grinding stones to process the maize. As with practically all the other Maya sites, *metates* are found throughout the domestic areas at the site and are in fact quite common in association with the monumental architecture, particularly the North Acropolis. No imported basalt *metates* have

FIGURE 4.9. Typical flat-bottomed bowl of the Yaxuná IVa complex (photo by V. Carrillo Bosch).

yet been reported. All of Yaxuná's grinding stones are made out of limestone, ostensibly of local origin. The lack of grinding stones made out of basalt distinguishes Yaxuná, once again, from the finding of such implements at Terminal Classic contexts at Chichén Itzá and more recently at Ikil.

In terms of local wares, we do not have sufficient data compiled on Formative period ceramic forms to make any broad statements, but analysis of the ceramic forms from the Classic period sequence of a deeply stratified midden on the North Acropolis gives an indication of the types of forms that were common during this period (table 4.6). As can be seen, roughly 40% to 50% of the total forms for Yaxuná II, III, and IV correspond to bowls of some sort (figure 4.9). While residue analysis has not been performed as of yet, the bowls were most likely used to consume *atole*-type meals. The only other large category of forms is jars, primarily composed of unslipped, short-necked, and striated cooking jars (many of which have use wear from the fire; figure 4.10), but also longer-necked liquid storage jars. There are few examples of other forms like basins, vases, or plates that might indicate other activities such as storage or other kinds of food preparation or consumption. Generally speaking, the artifactual inventory points to a high consumption of a range of maize gruels and possibly soups and stews, in addition to the tamales represented in the regional iconography. As with other areas of the lowlands, we find a notable absence of *comales*, which were used in a later

TABLE 4.6. Distribution of ceramic vessel forms by ceramic complex in a deeply stratified midden deposit on the North Acropolis (from Stanton and Marengo Camacho 2014).

	YAX IA		YAX IB		YAX II		YAX III		YAX IVA		YAX IVB		TOTAL	
Form	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Bowl	0	0	13	14.3	23	17	219	18.6	65	22	41	16	361	18.4
Curved-bottom Bowl	0	0	6	6.6	15	11.1	93	7.8	33	11.1	18	7	165	8.4
Flat-bottom Bowl	0	0	19	20.9	22	16.3	223	18.8	43	14.5	71	27.7	378	19.2
Composite Bowl	0	0	0	0	1	0.7	4	0.3	1	0.3	0	0	6	0.3
Miniature Bowl	0	0	0	0	0	0	4	0.3	0	0	1	0.4	5	0.3
Total of Bowls	0	0	38	41.8	61	45.1	543	45.8	142	47.9	131	51.1	915	46.6
Tecomate	0	0	1	1.1	8	5.9	44	3.7	19	6.4	8	3.1	80	4.1
Not Identified	1	20	9	9.9	6	4.4	71	6	22	7.4	17	6.6	126	6.4
Jar	3	60	26	28.6	31	23	324	27.3	79	26.7	68	26.6	531	27
Globular Jar with Short Neck	1	20	4	4.4	8	5.9	45	3.8	4	1.4	4	1.6	66	3.4
Total of Jars	4	80	30	33	39	28.9	369	31.1	83	28.1	72	28.2	597	30.4
Vase	0	0	2	2.2	2	1.5	15	1.3	0	0	4	1.6	23	1.2
Globular Vase	0	0	0	0	2	1.5	3	0.3	0	0	0	0	5	0.3
Pyriform Vase	0	0	0	0	0	0	2	0.2	0	0	0	0	2	0.1
Total of Vases	0	0	2	2.2	4	3	20	1.8	0	0	4	1.6	30	1.6
Basin	0	0	7	7.7	6	4.4	82	6.9	17	5.7	20	7.8	132	6.7
Short Basin	0	0	0	0	1	0.7	1	0.1	0	0	0	0	2	0.1
Total of Basins	0	0	7	7.7	7	5.1	83	7	17	5.7	20	7.8	134	6.8
Plate	0	0	0	0	5	3.7	47	3.9	12	4.1	3	1.2	67	3.4
Pot	0	0	4	4.4	1	0.7	1	0.1	0	0	0	0	6	0.3
Apaxtle	0	0	0	0	0	0	4	0.3	0	0	0	0	4	0.2
Pitcher	0	0	0	0	0	0	3	0.3	1	0.3	1	0.4	5	0.3
Lid	0	0	0	0	4	3	0	0	0	0	0	0	4	0.2
Total by Phase	**5**	**100**	**91**	**100**	**135**	**100**	**100**	**1185**	**296**	**296**	**256**	**100**	**1968**	**100**

FIGURE 4.10. Typical short-necked cooking jar of the Yaxuná IVa complex (photo by V. Carrillo Bosch).

period to produce tortillas after nixtamalization—that is, the process in which maize grains are soaked and cooked in limewater before being hulled. There is no artifactual data concerning this type of processing at Yaxuná.

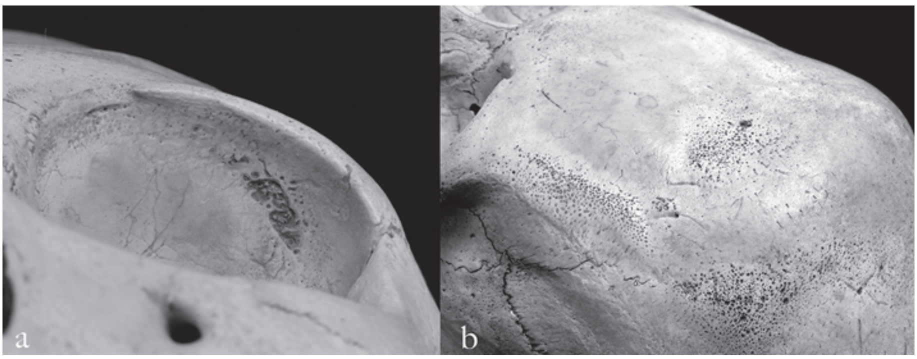
NUTRITION AND SKELETAL DISORDERS DURING CHILDHOOD

In this section we elaborate on two chronic health conditions in children: spongy hyperostosis and *cribra orbitalia* (hyperostosis of the orbital roofs). Both types of hyperostosis manifest with a porous appearance of the bones of the skull due to the expansion of the inner trabecular (spongy) bone toward the outside. Physiological stress during this early stage of life is most commonly related to childhood diseases and nutritional deprivation during and, even more so, after weaning. If the different isotopic signatures and skeletal pathologies scored in ancient Maya skeletal series are followed, weaning should have occurred any time short of a year of age to up to three or four years.

In this same line of research, Wright and Schwarcz (1998:13–16) compared the $\delta^{13}C$ isotopes of permanent teeth (characterized by different ages of formation and eruption) from Kaminaljuyú, in the Guatemalan highlands, in order to infer the nutritional changes among babies, toddlers, and children. Their results show that babies were likely completely breastfed

FIGURE 4.11. Linear enamel defects in a mandibular canine. Defects appear as horizontal grooves of diminished thickness in the enamel (photo by A. Cucina).

FIGURE 4.12. (a) Cribra orbitalia in the center of the orbital roof of Burial 27-2, Yaxuná (PIPCY/UDLAP); (b) severe but healed areas of porotic hyperostosis in subscribed areas of the forehead of Burial 27-2, Yaxuná (PIPCY/UDLAP) (photos by V. Tiesler).



up to one year of age. After that, toddlers were gradually accustomed to solid food. Weaning was probably achieved first by enriching, then supplementing, and finally substituting breast milk altogether with maize *atoles* and soft gruels (nutritionally low in iron). The stable $\delta^{18}O$ ratios in young children indicate that an adult diet was not adopted until five or six years of age, as Wright and Schwarcz (1998) demonstrate.

Other lines of research confirm this scenario, adding more locally relevant context. For example, a detailed reconstruction of subadult life and health hazards has been possible at the Classic period site of Xcambó with its large skeletal series (see also chapters 2 and 3), which is located only some 150 km from Yaxuná. Georgina Reyes and her colleagues (2006; see also Méndez Colli et al. 2009; Reyes 2007; Sierra Sosa et al. 2014a) conclude that weaning in this coastal population appears to have been completed during or past the toddler age, specifically by two or three years of age. This must have translated into a time of higher vulnerability to nutritional stress and acute infections, as zoonotic environmental loads were no longer buffered by the maternal antigens provided by the breast milk when weaning occurred. In fact a small peak in childhood mortality does occur around 2 to 2.5 years of age at Xcambó, which is associated to the postweaning exposure to environmental conditions. Further weaning-related stress is expressed by growth disruptions (as materialized by a disjunction between dental maturation and long bone diaphyseal growth), severe dental hypoplasias (figure 4.11), and the onset of active porotic hyperostosis in the orbital roofs and neurocranium (figure 4.12a, b).

ANEMIA AND SPONGY HYPEROSTOSIS

Spongy hyperostosis of the external skull and the orbital roof are two unspecific but robust stress markers of childhood (Schultz 1988, 2001). Spongy hyperostosis is conditioned by nutritional deprivation more than other carential diseases (some of which have already been discussed in chapter 3), and both porotic reactions are fundamentally restricted to the first years of life. When active, they are observed on the external surface as sharp spicules and delimited resorption areas. Apart from the quality of the pores and their anatomical distribution, thin sections of the affected areas can point to the origins of the hyperostosis (Schultz 1988, 2001), most of which appear related to childhood anemia in the Maya area (López 2016). Suffering from this health condition, lack of or deficient red blood cells will be compensated by the organism by recruiting new erithropoiectic marrow space, leading among other changes to the expansion of the cranial diploe (i.e., the cranial inner trabecular bone). Past childhood, cranial maturation will limit any new porotic remodeling of this sort. If the individual reaches maturity, those lesions will have healed and will manifest themselves as areas of hardened porotic surfaces in the adult skull, some of them thickened (figure 4.12). This is an important stress marker, especially in a small skeletal series, because not only subadults but all age groups can be considered during analysis of the remains.

PROCEDURES

Grouped according to mortuary category and sex, *cribra orbitalia* and porotic hyperostosis were scored in all preserved skulls from Yaxuná (N = 22) by one of the authors (V. T.). These lesions manifest as porotic surfaces that may appear thicker than the remainder of the skullcap, especially in their active state. We analyzed all the individuals in the Yaxuná sample and, when present, distinguished between active and healed state, distribution, severity, and etiology. For the latter, thin sections were obtained in all preserved lesioned segments, following the protocol established by the UADY Laboratory of Bioarchaeology and Histology (López 2016; Tiesler et al. 2006) (figure 4.13). In regional comparisons we use reported or published data contained in our regional database. Again, all specimens were scored by the same author.

TRENDS IN POROTIC HYPEROSTOSIS AND CRIBRA ORBITALIA

The Classic period local series shows levels of skull exposure of a shade below 50% (10 out of 22) to this physiological stress marker at Yaxuná (table 4.7). Unfortunately, there were too few sufficiently well-preserved remains to account for cribrotic frequencies in this series (N = 5), beyond confirming its presence in two specimens. Most cranial lesions were observed in a healed state and conform to the classic anemia-related pattern of diploic expansion. The one exception is the skull of a young female recovered from a rock-shelter associated with the North Acropolis, likely a collapsed cave that would have had important ritual functions. This foreign-born youngster shows lesions that are more aligned with systemic

FIGURE 4.13. Thin section of healed albeit thickened parietal lobe of Burial 15A, Yaxuná, showing a thickened diploe and healed lamina (photo by R. López).

TABLE 4.7. Percentage of skulls with spongy hyperostosis (SH) and *cribra orbitalia* (CO).

STRESS MARKER	YAXUNÁ* % [N]	DZIBANCHÉ/ KOHUNLICH* % [N]	CLASSIC INLAND YUCATAN % [N]	POST-CLASSIC INLAND YUCATAN % [N]	CLASSIC COAST % [N]	POST-CLASSIC COAST % [N]
SH	45.5 [22]	58.8 [34]	54.5 [55]	74.7 [174]	29.9 [408]	79.1 [153]
CO	40.0 [5]	27.8 [18]	31.6 [19]	39.1 [156]	16.5 [273]	39.6 [91]

*Only individuals with age range and dated to the Classic period were included.

weakening of the connective tissue. In this case, the underlying condition(s) led to repeated, albeit healed, ossified hemorrhages in the sub-periosteal spaces. These health problems are identified with a host of conditions, including scurvy (Ortner 2003).

Compared to other central inland sites, Yaxuná's inhabitants were seemingly on the lower end (i.e., they were relatively healthy). When compared to other Classic period urban populations, this trend is quite apparent. For instance, half of the sampled inhabitants of the metropolis of Calakmul demonstrate evidence of this stress-related condition; similar ratios are found in the urban samples from Dzibanché and Kohunlich, to the east of Calakmul. Still more unsettling in this regard are the frequencies further south, as reported by Storey (1997) for Copán or by Wright (2006) for Río de la Pasión area; the great majority of the inhabitants of these regions have scars from childhood hyperostosis.

However, when inland settlement populations from the north, such as at Yaxuná, are compared to coeval coastal populations, the frequency of porotic hyperostosis among the former is roughly twice, a trend that is similar when we compare frequencies of *cribra orbitalia*, although the differences are not significant (Fisher's exact test, respectively $p = 0.1535$ and $p = 0.1997$) (table 4.7). Given the dominantly anemic origin of this stress marker, it is likely that a better and more protein-rich marine diet in coastal settlements during the Classic period buffered the local population against the rampant occurrence of this kind of systemic ailment.

Taken together, we may cautiously conclude that Yaxuná's children were not exempt from the nutritional stresses of childhood. They seem to be relatively spared from the health consequences of prolonged anemia; yet when compared to analogous urban environs from the southern part of the peninsula, the differences for both porotic hyperostosis and *cribra orbitalia* are well away from reaching levels of significance (Chi-square respectively 0.972, 2 d.f., p = 0.615 for porotic hyperostosis, and 0.28, 2 d.f., p = 0.869 for *cribra orbitalia*). This conclusion holds in respect to the urban central and southern lowland populations where families crowded in packed living spaces and were sustained by rather undiversified diets (at least those impacting the weaning process) that were paying a heavier health toll.

Considered in a larger time frame, the consideration of the local health record at Yaxuná begs broader questions regarding the dramatic increase of hyperostosis across the coastal and inland territories during the second millennium AD (table 4.7). Speaking for the Postclassic peoples residing along the peninsular coastline, there were no dramatic environmental changes that could account for the more than doubled frequencies of these conditions when compared to the large Classic period coastal sample (in both cases, porotic hyperostosis and *cribra orbitalia*, differences are highly significant, p = 0.000). With direct access to marine resources, Maya seafolk could well have used those food staples in order to mitigate the effects of anemic disease in their weaned toddlers. As this did not appear to have happened, we are left to conclude that either iron-depleting parasitic diseases were common or that certain cultural traditions in feeding children, some of them adverse to health, must have weighted heavily in the centuries prior to European contact.

ORAL PATHOLOGIES, FOOD INTAKE, AND DENTAL HYGIENE

Oral pathologies, which include abscesses, loss of teeth in life, and carious lesions in particular, represent a long-standing health problem that affects human well-being and individual and collective quality of life. The etiology of carious lesions, as a consequence of abscesses and loss of teeth in life (AMTL [Antemortem Tooth Loss]), is multifactorial and complex. The prevalence of caries is often related to such factors as diet, lifestyle, and daily habits, among others that operate on different collective socioeconomic levels. At the same time, a host of intrinsic predispositions count, such as saliva acidity and density, hormonal levels, and dental morphology (Aufderheide and Rodríguez-Martín 1998; Cucina et al. 2011a; Hillson 2008; Larsen et al. 1991; Lukacs 2008, 2011a, 2011b).

CARIOUS LESIONS

A carious lesion is the result of a chemical demineralization of the dental tissue (enamel and/or dentine) caused by the acidic by-products produced by oral bacteria. Note that, for humans, caries became endemic almost everywhere in the world with the adoption of an agricultural subsistence strategy; therefore it is unsurprising that all recent and modern populations with agriculturally reliant subsistence economies are impacted by high levels of such infections (Turner 1979). Processed carbohydrates and especially sugars enhance the acidification process of oral bacteria and increase the eventual net mineral loss triggering the onset and progression of dental caries (Hillson 2008; Takahashi and Nyvad 2011).

In ancient Mesoamerica, analyses of skeletal collections have yielded caries frequencies consistent with those of populations of other parts of the world where cariogenic staple crops were predominantly consumed; high rates of carious lesions have been reported in almost every pre-Hispanic site analyzed to date, with cariogenic frequencies ranging from 8% to over 30% (Cucina and Tiesler 2003; Cucina et al. 2011a; Magennis 1999; Reed 1999; Seidemann and McKillop 2008; White 1999; Whittington 1999).

Maize, the main and most important staple crop in the Maya region, is generally considered the causative factor for the high frequencies of oral infectious disease, while protein-rich foods, such as marine resources consumed in coastal areas or animal proteins assumed to be consumed at higher rates by high-status sectors of the society, are often cited to account for lower frequencies encountered at specific sites (Cucina and Tiesler 2003; Márquez Morfín and Hernández Espinosa 2007). With few exceptions, women are found to have suffered higher caries rates than men. This finding has commonly been explained as a consequence of consuming a diet richer in carbohydrates, thereby implying a differential access to resources tied to socially constructed gender roles (Larsen et al. 1991).

Lukacs (1996, 2008) reports that women suffered from carious lesions more frequently and more severely than males both in the Old World and in the New World due to the decline in health and living conditions soon after the adoption of a production economy based on agriculture (see also Larsen et al. 1991). Together with changes in daily habits and a gender-based division of labor that exposed women to a more frequent contact with food during the day (Larsen et al. 1991), women's reproductive biology and increased fertility contributed further to the decline in women's oral health (Lukacs 1996, 2008, 2011b; Lukacs and Largaespada 2006; Lukacs and Thompson 2008).

Regarding the sample at Yaxuná itself, the caries were scored on all adult permanent teeth (age 20 and above), based on a scale from 0 to 4.[3] However, given that grade 1 caries can be easily confused with noncarious pits (and vice versa), caries are commonly counted as such starting from grade 2 and above (figure 4.14). They were scored using the tooth-count method (Cucina et al. 2011a) only on adult individuals, leaving aside the subadult population. The adoption of such an approach in archaeological collections is due to the notorious underrepresentation of subadults in skeletal collections. We use this method to make data comparable with published data in the literature.

Table 4.8 displays the presence, degree of severity, and frequency of caries by tooth type in the maxillary and mandibular dentitions. Multiple cavities indicate that more than one demineralization event had affected the same tooth, but because the frequency of affection is calculated by tooth number, we decided to treat the dental pieces showing more than one cavity in the same way as those manifesting only one carious lesion. In any case, only six teeth

FIGURE 4.14. Grade 3 carious lesions affecting a mandibular second molar (photo by A. Cucina).

(out of a total of 52) presented more than one lesion. The final overall frequency of caries in the adult segment of Yaxuná is 14.9% (52/350).

As expected, posterior teeth, in particular the molars, are those that manifest higher frequencies of infectious demineralization, with percent frequencies that range from 23.5% to 50.0%. Overall, the frequency in the upper dentition (14.5%) and in the lower dentition (15.2%) results in a total frequency of 14.9%. Table 4.8 shows a great discrepancy between the anterior and the posterior dentition, with the premolars behaving much more like the anterior teeth than the posterior ones. Such values fall within those expected for populations whose subsistence is based on extensive agriculture (Turner 1979) and are consistent with frequencies reported for other archaeological collections in the Maya area whose subsistence rested mainly (though not exclusively) on maize.

Table 4.9 displays the frequency of carious lesions in this and other sites of the region (only Xcambó was reported by sex—see Cucina et al. 2011a). In this panorama, oral health at the site of Yaxuná suggests heavy but not particularly intense infectious conditions. The overall frequency of 14.9% stands in the middle of the distribution obtained from other coeval sites in the northern lowlands. Little load was found among the royals at Calakmul (Cucina and Tiesler 2003). This low value was due to the very low frequency in male elites. Their female counterparts presented much heavier oral infections, even higher than the commoner sector of the society (Cucina and Tiesler 2003), though still below the frequency encountered at Yaxuná. Data from other inland sites, particularly Noh Bec and a series of sites in southern Petén, however, present caries up to twice as frequent as in Yaxuná. In these cases, the limited access to cariostatic resources, and a stronger reliance on carbohydrates, is considered as the possible cause of carious lesions. The general comparisons with other sites seem to suggest that the level of carious lesions at Yaxuná can be due to a reliance on vegetable cariogenic foods (like maize), just like other inland contexts. This seems to be consistent with the fact that the majority of the individuals fell into the range of C_4 plants, as calculated from $\delta^{13}C$ ratio.

TABLE 4.8. Absolute values of teeth affected by carious lesions (by grade of severity) and frequency of caries by tooth type.

MAXILLA	PRESENT	TOTAL	GRADE 2	GRADE 3	GRADE 4	MULTIPLE	%
I1	3	28	1	2			10.7
I2	1	25	1				4.0
C	0	28					0.0
P3	2	22	2				9.1
P4	2	25	2				8.0
M1	4	17	3	2		1	23.5
M2	9	24	4	3	2		37.5
M3	6	17	6	1		1	35.3
TOTAL	27	186	19	8	2	2	14.5
MANDIBLE	PRESENT	TOTAL	GRADE 2	GRADE 3	GRADE 4	MULTIPLE	%
I1	0	20					0.0
I2	0	21					0.0
C	1	19	1				5.3
P3	2	25	2				8.0
P4	0	20					0.0
M1	6	21	6	2		2	28.6
M2	9	24	9				37.5
M3	7	14	8	1		2	50.0
TOTAL	25	164	26	3		4	15.2

Comparing inland cariogenic frequencies with those of the coastal Maya provides some interesting patterns. Such a settlement is Jaina, located on an island off the west coast of Campeche. This site has relatively low frequencies of carious lesions. Being on the coast, it is very likely that Jaina enjoyed a diet based mostly on marine resources, which are typically cariostatic. Conversely, another coastal site (Xcambó) manifests extremely high frequencies, in particular in females during both occupational phases. Despite the site's location along the coast, Cucina and his colleagues (2011) concluded that the increase in frequency of carious lesions for both sexes, and more so in females, must have been the direct result of an increased intake of sugary foods, such as honey or honey-sweetened cacao. This could have been one expression of an ameliorated lifestyle that came along with the growth in importance of this trade port during the Late Classic—that is, improved living and economic conditions granted the inhabitants of both sexes access to some kind of (cariogenic) food, like honey-sweetened cacao, not previously ingested in large quantities, or not ingested at all. In fact, the archaeological record shows ample evidence of recipients specifically made to prepare and drink cacao during the Late Classic; given its intrinsic bitterness, it is very likely that some

TABLE 4.9. Frequency (%) of carious lesions in various sites in the northern lowlands during the Classic period.

	TOTAL	MALES	FEMALES
Yaxuná	14.9		
Southern Petén	23.4		
Xcambó* Early		7.4	21.2
Xcambó* Late		14	27.4
Jaina	9.4		
Calakmul** (elite)	4.0		
Calakmul** (commoners)	6.0		
Noh Bec	28.0		

*Cucina et al. 2011a.
**Cucina and Tiesler 2003.

sugary additive was added to it. Yet we must remember that carious lesions are multifactorial in nature, which also includes oral hygiene, therefore limiting inferences on the whole set of factors involved in their formation (Cucina et al. 2011a). Regardless of reason, Seidemann and McKillop (2008) also report very high frequencies of carious lesions for the coastal site of Wild Cane Kay in Belize, indicating that this pattern is not restricted to Xcambó but may be relatively widespread along coastal areas during the Late Classic when coastal trade becomes more important.

The frequency of carious lesions at Yaxuná is slightly higher than the ones encountered by Vega and Cucina (2014) in a maize-based modern and traditional Maya community in northern Yucatán, whose subsistence economy relies on maize, although it also includes a large array of other noncariogenic foods of primarily vegetable origin. However, this study limited the age range to thirty years of age, leaving aside older individuals, making the comparison to the Yaxuná collection a bit tenuous. It must be reiterated that caries are multifactorial in nature, and many variables that play a role in their development (positively or negatively) are beyond reach in bioarchaeological studies. In the case of Yaxuná, poor preservation and fragmentation of the skeletal remains mitigates any association with age at death and sex, which in turn limits the possibility of a more thorough interpretation of the data.

AMTL AND ABSCESSES

Abscesses represent the macroscopic evidence of an infectious process in the alveolar bone caused by bacteria that enter the dental system through either a carious lesion, excessive occlusal attrition that opens the pulpal chamber to the external environment, or through a periodontal access (Hillson 2008). In the Maya region during the Classic period occlusal

TABLE 4.10. Presence and frequency of abscesses and AMTL by tooth type.

	AMTL			ABSCESS		
MAXILLA	PRESENT	TOTAL	%	PRESENT	TOTAL	%
I1	0	11	0	0	10	0.0
I2	0	13	0	1	11	9.1
C	0	13	0	0	12	0.0
P3	0	11	0	1	8	12.5
P4	0	9	0	0	10	0.0
M1	0	10	0	0	7	0.0
M2	0	10	0	0	7	0.0
M3	0	9	0	0	7	0.0
TOTAL	0	86	0	2	72	2.8
MANDIBLE						
I1	2	16	12.5	1	10	10.0
I2	1	15	6.7	2	13	15.4
C	0	16	0.0	1	10	10.0
P3	2	12	16.7	1	11	9.1
P4	4	15	26.7	1	10	10.0
M1	5	17	29.4	2	11	18.2
M2	3	18	16.7	0	11	0.0
M3	0	10	0.0	0	9	0.0
TOTAL	17	119	14.3	8	85	9.4

wear was relatively limited, and the majority of the infectious reactions in the alveolar bones were due to carious lesions. Severe infections can cause the loss of the tooth (AMTL), either as intentional extraction to relieve the pain and suffering, or because of loss of adhesion of the root to the alveolar bone. In archaeological human remains, they are calculated out of the presence of alveolar sockets.

At Yaxuná, abscesses and consequently AMTL appear respectively in 6.4% and 8.3% of the scoreable series (table 4.10). Interestingly, both afflictions seem to have affected mainly the mandibular bone and teeth, since their frequency in the maxilla is respectively 0% and 2.8%, while in the mandible they are present in 14.3% and 9.4% of the cases. Such a difference between maxilla and mandibles does not mirror the pattern shown by carious lesions, where frequencies are more balanced. It is worthy noting that three of the eight cases of abscesses were scored in the mandible of the paramount in B23, indicating once more that being a member of the elite did not fully protect individuals from diseases and infections. Currently, there is a general lack of bibliographical information on abscesses and AMTL in the Maya region because the poor preservation affects the bony remains more than the teeth, making the former a less reliable indicator of oral health.

DIETARY PERSPECTIVES, CULTURE, AND IDEOLOGY

In this chapter we have explored the changing patterns of health and diet as indicated by the different datasets provided by the skeletal population of Yaxuná and their material culture. Given that the natural environment had remained essentially the same over the centuries encompassed by this study, we conclude that the transformations inferred from the different pathognomic and isotopic signatures must have been driven heavily by cultural procurement processes, along with long-standing, albeit shifting, consumption habits and preparation techniques.

Evaluated within their specific cultural setting and compared with similar pre-Hispanic, urban contexts in the Maya area, our results appear to provide "snapshots" of the living conditions throughout an extended portion of the population history of the Yucatán Peninsula. As we have already concluded in chapter 3, the estimated maximum statures demonstrate a considerable health burden among the dwellers of Yaxuná, although LEH seemingly indicates a relatively stress-free infancy. Other skeletal series from inland sites show levels of exposure to nonspecific physiological stress that we consider high, an aspect also considered in the present chapter.

The data we have concerning diet at Yaxuná are in many ways unsurprising. The pre-Hispanic Maya population, in general, relied heavily on maize, squash, and beans, although they also made extensive use of tree cropping (Lentz 1999). They also consumed animal proteins, which depended on access to marine or terrestrial resources. Given that Yaxuná is over 100 km from the nearest coastline, and also given the lack of large bodies of surface water, it is unsurprising to see that the dietary data point to a reliance on maize and other crops for the Classic period. Interestingly the nonlocal individuals represented in the sample tend to present less evidence for maize consumption, indicating important regional variations in the intake of plants across the lowlands. Additionally, there is no material or chemical evidence for the consumption of marine resources at Yaxuná, as the $\delta^{15}N$ values in our sample indicate the possible consumption of herbivores, such as deer (*O. virginianus*), with values in the $\delta^{15}N$ 4–6 range.

From here, we are left to interpret and discuss how the people of Yaxuná performed collectively as social actors in a changing society. Moving from the concept of sex (the biology) to the concept of gender (a cultural construct), and from the concept of biological age at death to the concept of social age and age-related horizontal stratification, we are left to address urban lifestyles and health, social status, and gender during times of fluctuating extrinsic living conditions. Given the data at hand, we may now provide new answers regarding questions of how gender, urban life, and status aggregations led either to the deterioration or improvement of health.

Regarding gender and social ages, we conclude from our profiles that the gender of infants does not appear to have been an important factor in child nutrition, one that would have led to differences in access to food and, ultimately, childhood care. Sex cannot be determined in infant skeletons, which limits the possibility to assess selective sex-related mortality at young ages. Nonetheless, indirect indicators of health at age of development recorded in sexed adults, who still carry the lesions of their childhood diseases in their bones and teeth (like linear enamel hypoplasia, porotic hyperostosis or *cribra orbitalia*), clearly show that males and females were equally exposed to environmental stressors (Méndez Colli et al. 2009) during their infancy, supporting the idea of an equal, gender-unrelated treatment. This apparent equality in the upbringing of infants and of girls and boys later in time may find a most simple explanation indeed, one that has to do with the fact that at least parenting was gendered. In houses and other domestic spaces, it was likely mothers and mostly female relatives who were in charge of rearing their infants, which they most probably did in a uniform way.

Overall, the data indicate that the population at Yaxuná retained relatively good health in terms of subsistence, even during the Terminal Classic period. Quite in contrast to other lowland Maya settlements to the south during this time, which underwent high degrees of physiological stress during upheaval and destabilization (oftentimes cited as one of the reasons for the Classic Maya collapse), Yaxuná experienced both a political and demographic revival. Our data would indicate that perhaps this revival was linked to access to resources that were becoming more scarce in other regions, although ultimately, this "prosperity" would pass to the emerging nearby urban center of Chichén Itzá. In this logic, it appears that the population at Yaxuná was able to grow and retain relatively good levels of health during this tumultuous period until being absorbed by Chichén Itzá and its hegemony.

Apart from subsistence strategies, access to resources, and food processing and consumption, research on ancient foodways also ties in directly with social organization and religious ideology. Unfortunately, our understanding of ancient Maya lifeways and foodways is not as refined in comparison to the rich setting of today's Maya communities, mainly due to preservation, restricted areas of study, and issues concerning controlling for chronology. Therefore we can only imagine the complexities of quotidian life, consumption, and food ideologies by drawing analogies with what we can see in ethnographic settings in the area. On a purely conceptual and theoretical base, we follow that some general Mesoamerican concepts concerning food could have been held at Yaxuná as well, especially in light of the extended and embedded millenary traditions that were followed across the Maya and native Mesoamericans landscapes (López Austin 2001). Such is the Mesoamerican food taxonomy of "cold" and "hot." In spite of the variability across the cultural spheres, this dichotomy was, and still is, linked to gendered roles in the food system in many a Mesoamerican society (see Staller and Carrasco 2010 for a broader discussion).

On a more transcendental level, Maya and Mesoamericans deemed eating an essential activity not only among the people but of their gods. The cosmic food chain started in the divine underworld, where food was present or procured to be consumed by humans; in turn

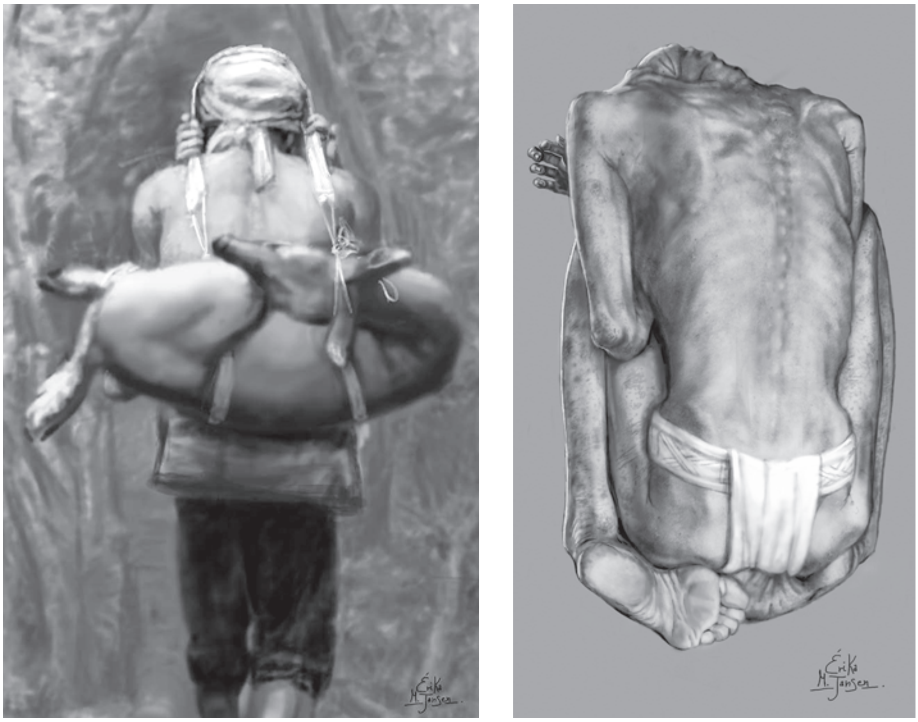


FIGURE 4.15. (a) A Yucatecan hunter carries a tightly bundled deer after a successful hunt (redrawn from snapshot, provided by the Departamento de Ecología Humana/ CINVESTAV, Unidad Mérida); (b) packaged body of a young male deposited in a sacred rock-shelter on the North Acropolis of Yaxuná. The particular positioning evokes notions of a deer hunt (drawings by Érika Meijide Jansen). The corpse has been rendered emaciated; his skin is shown spotty due to diffuse hemorrhages from terminal brucellosis.

humans were to feed the gods with donated food staples. These signified that real or symbolic food provisions were destined to feed divine entities. Specific donated comestibles, usually identified with copal or maize in the form of tamales, were held to be flesh and specifically human flesh and essence, an association we will take up in the following chapters. Likewise, human bodies and specifically their heart and blood were held to be appropriate "food staples" to feed the divine (Freidel and Reilly 2010; Stross 2010; Taube 1985).

This *hierophagic* (i.e., hierarchically distributed food) cycle distills one of the core beliefs in Mesoamerican cosmology, which looks back on thousands of years of tradition and ritual practice (Christenson 2010; Graulich 2005; Graulich and Olivier 2004; Monaghan 2000:36; Taube 1985; plate 4.1). The ancient Maya have used food as an essential ingredient in nearly all festive religious interactions just like other cultural Mesoamerican peoples. These religious transactions were afforded by either feasting or avoiding specific foods, by fasting and by donation of suitable edibles (Stross 2010). Until recently, these included human sacrifice. Victims were to be prepared ritually for the occasion for weeks and months, to be ritually slaughtered on a prescribed date and in a prescribed way in order to feed effectively the divine embodied in godly entities, a topic to be taken up in chapter 8 (figure 4.15).

Along these same lines we can also conceive the naturally deceased dead, whose treatments would symbolically display the notion of food exchange between the human world and the "otherworld," as indicated by the almost ubiquitous inclusion of food preparation and/or consumption vessels (usually bowls and jars) in burial contexts or the selection of mortuary placement itself, in which the dead body and especially the bony substrate would assume the role of vitalizing "seeds" of future life (Houston et al. 2006; Scherer 2015).

Further, careful selection of particular animal species for inclusion among the grave goods (often deer) is common at Yaxuná and other sites across the lowlands. One spectacular context at Yaxuná itself demonstrating this idea comes from a Late Postclassic crypt assemblage (Götz and Stanton 2013). The articulated male of Burial 19 was accompanied by a select assemblage of skeletal remains, among which snakes, vultures, cottontail rabbits, birds, lizards, dogs, opossums, felines, and deer were present. While some species may not have served as food offerings per se, most of them, wild or domesticated, count among the common faunal food staples consumed by the Maya.

5

PHYSICAL EMBODIMENT AND SOCIAL IDENTITIES AT YAXUNÁ

Man is known by his sight, his face, his gait and his laugh . . .
—BARTOLOMÉ DE LAS CASAS (1967),
APOLOGÉTICA HISTORIA SUMARIA, CHAPTER XIX

INTRODUCTION

THE HUMAN BODY—in its material and organic quality—is the basis and mediator of all human interaction and hence pivotal in studying sociocultural dynamics. This idea, put forth decades ago by Alfredo López Austin (1989) for ancient Mesoamericans, holds true today more than ever, at least for academia. Scholars have increasingly used the social "construction" of the body to study culturally guided notions of beauty and aesthetics and, beyond that, the interstices among the mind, body, and society. In this quest, scholars have received intellectual input from phenomenological, structural, and semiotic theory (Le Breton 1994; Mauss 2007; Turner 2007). Incursions into the body and its forms of embodiment confer insights on the relationships among individuals and on society itself. This is taken to the extremes by Michel Foucault (1995), who envisages the trained, disciplined, and sometimes punished body as a socially dependent, passive substrate of collectively imposed norms and divergent agencies.

Local body ontologies vary across the cultural landscapes of the present and past and aquire their own signatures. Among the ancient lowland Maya, the body was not considered a passive organic medium, but rather a vessel or bundle of vital essences crafted by and for the divine beings in collaboration with their human caretakers (Houston et al. 2015; Velasquez Garcia 2015). In its morphological makeup, the corporeal segments of enduring and ephemeral living matter were thought to engage in mutual exchange and interact agentively with the outer spheres of existence, concretely the inhabited environs of humans and the "otherworlds" of divinity (Houston et al. 2006; López Austin 2009, 2015; Velásquez 2015). Portals and conduits in this dynamic exchange were the senses, vocal and aural expression (especially verbal interaction), and the visual: gazes and garbs. These sensibilities are enduring as we see them in Yukatec Maya commmunities today. In the modern village of Yaxunáh a normal greeting of a neighbor on the path is "clear, well ordered, is my heartplace portal that I see you."

In this chapter we explore the ways locals and newcomers would assimilate their physical appearance, expressing shifting identities of the people growing up at Yaxuná and in its peninsular surrounding. Special focus is given to those forms of visible embodiment that have left traces in the skeletal record: dental decorations and head shaping. Both practices were commonly performed by Classic period Maya and led to permanent yet diverse results in head physiognomy. In life, these enhancements granted a distinctive look to their human bearers. The first part of the chapter delves into the techniques, instruments, and health risks involved in Maya head shaping and dental decorations. From here, we explore the multilayered native meanings and their social and political undercurrents, as signaled by the collective change in head forms and dental ornamentation through the ages. In this context, Yaxuná's body modifications acquired importance as potential ethnic signifiers in a landscape shared increasingly with coastal peoples and central lowlanders.

BODY AND DRESS AT YAXUNÁ

Bioarchaeological approaches are uniquely positioned to study permanent forms of physical embodiment in societies vanished long ago (Tiesler 2014; Tiesler and Lozada 2017). Portraiture and the mortuary record reveal a greater understanding of a number of dress codes and socially dictated apparel (Tremain 2011). Combined, these approximations bring us closer to the "social skin" of the body, to borrow the term coined by Turner (1998), and how it was experienced by the ancient Maya. Here we will use mostly skeletal information to put us face-to-face with the social actors of Yaxuná.

Unfortunately, Yaxuná's children, men, and women left few, if any, material clues over the centuries that we may call on to learn about their looks, adornments, and dress. No extensive portraiture from the site confers glimpses on the living, their body build, dress, or adornment. In the Terminal Classic period, elites decorated important buildings at the nearby satellite communities of X'telhú to the southwest and Popolá to the north with bas-relief depictions of lords, warriors, and captives in a style distinct from that of Chichén Itzá. While few stone carvings of this type have been recovered at Yaxuná proper, modeled and engraved ceramics from burial offerings at Yaxuná do hint that the styles found in the regional panels were also used at Yaxuná itself. While the costumes and adornments of these people are formulaic, showing ballgame paraphernalia such as leather aprons and shell tinklers around the waist, they also suggest a local social identity in large standardized serpent monster headdresses. A number of decades ago, Merle Greene Robertson (1986) wrote a report on the regional reliefs and provided a fine iconographic analysis of the costumes and ornaments. They were again featured in Schele and Freidel (1990, chapter 8) and in a paper by Magnoni and her colleagues (2014). Miniature relief depictions of ballplayers and lords on the basal frieze of Str. 6F-68 thus reinforce the notion that Yaxuná was the hub of such a distinctive social identity during this period around the ninth century AD. The main Terminal Classic palace complex in the East Acropolis at Yaxuná remains unexcavated, but it may reveal

FIGURE 5.1. (a) Collar made out of jadeite beads; (b) incised ear flare made out of shell with quatripartite motif (Burial 23; Yaxuná, Selz Foundation).

similar relief sculpture in the future. So the material record of the individuals buried at Yaxuná is still our most robust source of information in most periods as the iconographic record conveys only limited access to learning about costume and personal apparel. In the context of the Early Classic royal tombs featured in chapter 6 we have a bit more visual data to go on, such as the apparel placed into the tomb chamber of Burial 23 to accompany it occupant (figure 5.1). We will have more to say about this remarkable image in chapter 6.

PLATE 1.1. Lidar image of the center of Yaxuná.

PLATE 4.1. Ritual offering of copal balls during a Chorti ritual. Copán Ruinas, Honduras (photo by V. Tiesler).

PLATE 5.1. Olmec-style figurine from El Perú-Waka', showing 'ik' sign in open mouth (photo by Michelle E. Rich).

PLATE 6.1. Xul Incised: var. Xul bowl from Burial 2 (photo by Yaxuná Project, Selz Foundation).

PLATE 6.2. Poison bottle found in Burial 13 (Yaxuná Project, Selz Foundation).

PLATE 7.1. Burial 23: (a) funerary disposition of the single occupant of Burial 23; (b) details of the individual's upper torso; (c) upper part of the skeleton as embedded in marl (Yaxuná Project, Selz Foundation).

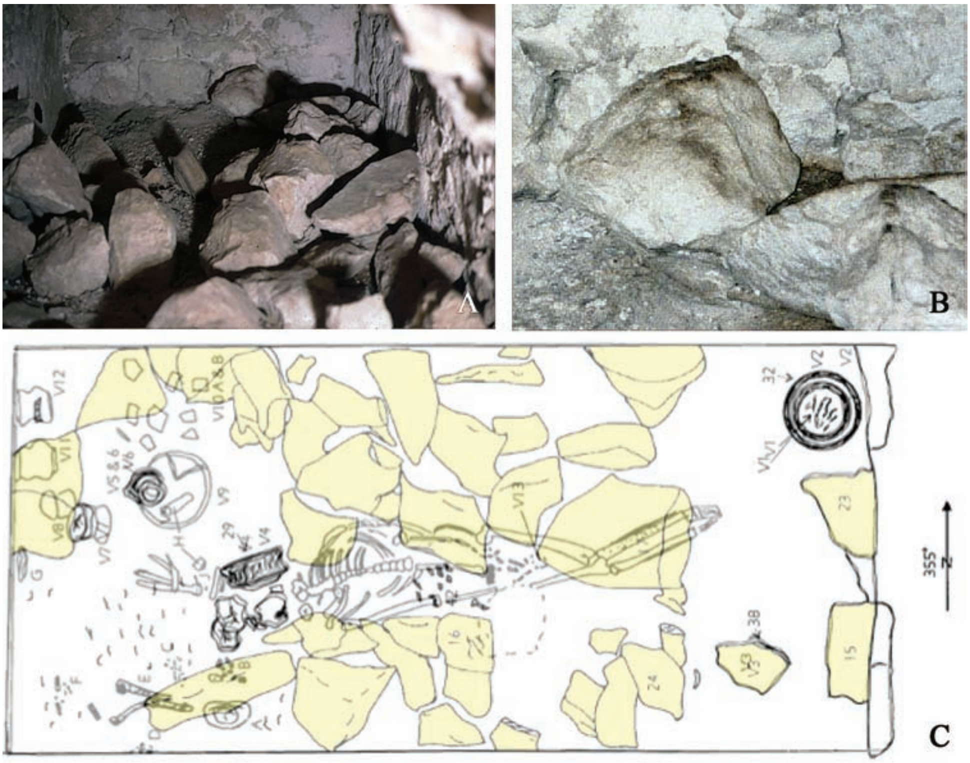


PLATE 7.2. Burial 23: (a and b) burial covered with scorched, angular rocks; (c) drawing of the skeletal disposition of Burial 23 beneath the placement of angular stones highlighted in yellow (Yaxuná Project, Selz Foundation, UADY).

PLATE 7.3. Charred hearth stones and ash accumulation surrounding a domestic hearth in the Maya community of Sihó, Yucatán (photo courtesy Lilia Fernández).

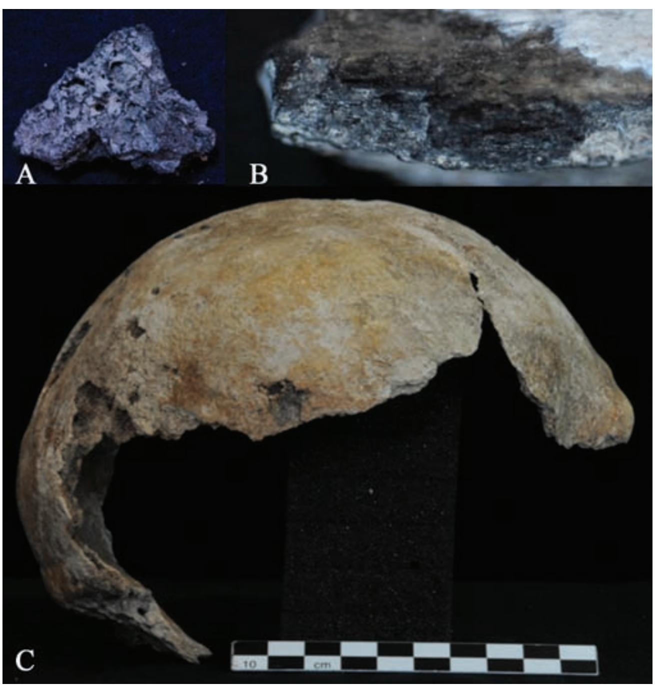
PLATE 7.4. Pair of Dos Arroyos polychrome dishes found in Burial 23 (photo by Yaxuná Project, Selz Foundation).

PLATE 7.5. Vessels from Burial 23 (photo by Yaxuná Project, Selz Foundation).

PLATE 7.6. Burial 23 showing the composite deer antler and bone headdress element above the head of the deceased (photo by Yaxuná Project, Selz Foundation).

PLATE 7.7. (a) Balanza Black Slab-Footed tripod vessel in Burial 24; (b) Burial 24, Yaxuná (Yaxuná Project, Selz Foundation).

PLATE 7.8. Burial 24-14, Yaxuná with: (a) remnants of cremation slag; (b) differentiated heat damage of long bone expressed by heat fracture, carbonized and calcined layers; (c) side view of artificially flattened skull cap of the deceased male. Slight color changes are noted in the parietals and occiput. Heat lines and focal charring is restricted to the lower parts of the temporal and occipital bones (Yaxuná Project, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).



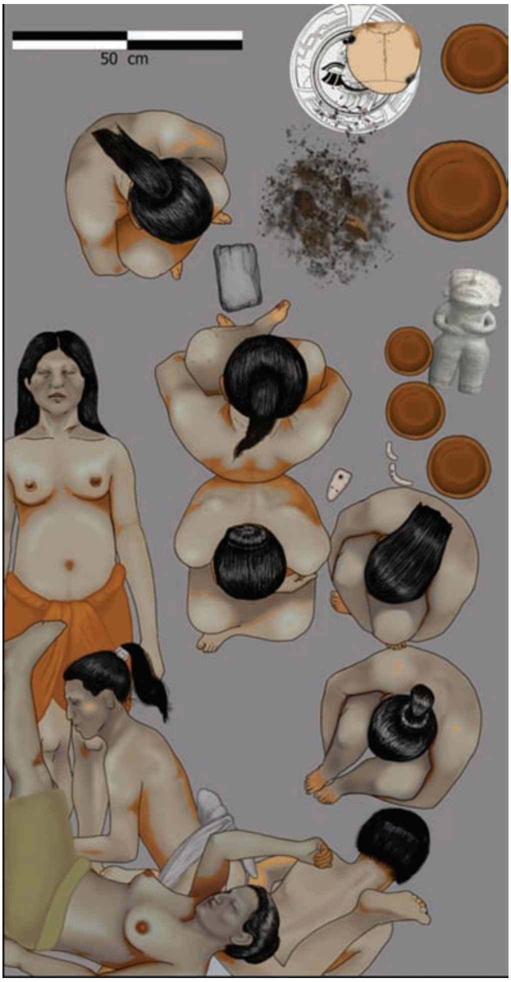


PLATE 7.9. Reconstruction drawing of multiple Burial 24, Yaxuná (drawing by M. Sánchez; Selz Foundation/UADY 2015).

PLATE 7.10. (a) Segments of a royal headband in polished and pierced Strombus associated with Burial 24-14; (b) jade diadem jewel in the form of a quetzal bird head, Burial 24-14.

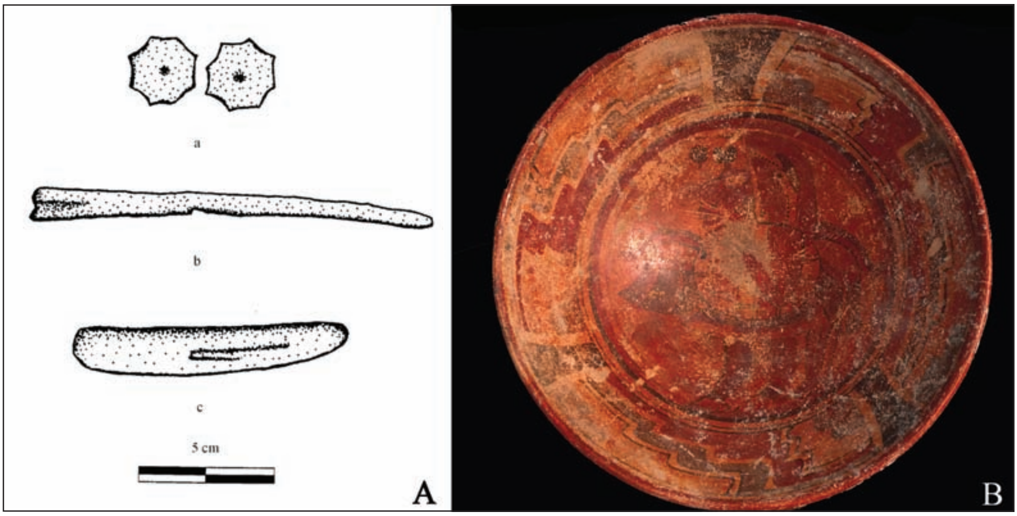


PLATE 7.11. (a) Shell ear flares, stylus and polishing stone in the Scarlet Macaw plate; (b) Avian Maize God impersonator wearing the Scarlet Macaw headdress and wings, multiple tails of a Teotihuacano warrior, and carrying a turtle carapace (photo by Yaxuná Project, Selz Foundation).

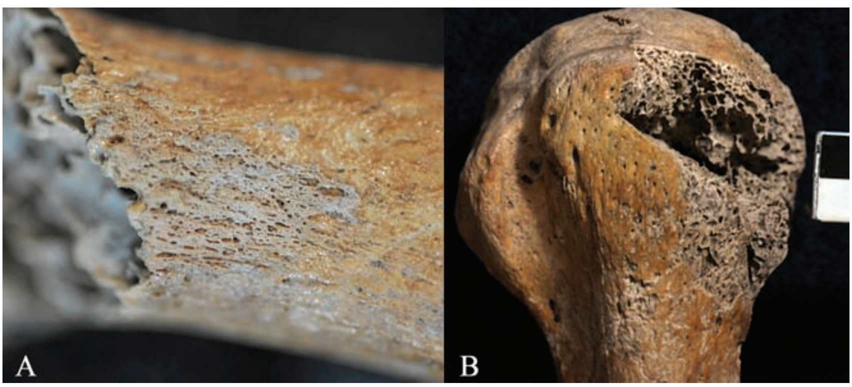


PLATE 7.12. (a) Recently sustained deep sub-periosteal bleeding of femoral metaphysis with initial ossification, Burial 24-7, Yaxuná; (b) blows to the left shoulder, sustained at the time of death of Burial 24-11, Yaxuná (Yaxuná Project, Selz Foundation 1994; Bioarchaeology and Histology Laboratory, UADY).

PLATE 7.13. (a) Ceramic figurine of the Moon Goddess; (b) detail of the Moon Goddess figurine showing the Lazy-S scroll on the right arm (photo by Yaxuná Project, Selz Foundation).

PLATE 7.14. (a) A god paints the Moon Goddess, who holds the shell paint pot. Both figures are framed by a Lazy-S cloud scroll; (b) the Moon Goddess gives birth to the rabbit. She wears the Lazy-S scroll on her arm. The old midwife Chak Chel holds the rabbit to the breast of the Moon Goddess (rollout photographs by Justin Kerr, mayavase.com).

PLATE 8.1. Cremains of Burial 22, consumed in a fleshed state (Yaxuná Project, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

PLATE 8.2. Exposed Burial 27-1 (PIPCY; photo by S. Simon).

PLATE 8.3. Distribution of skeletal segments of Burial 27-1 in (a) upper and (b) lower layer during archaeological exposure (PIPCY; photo by S. Simon).

Other burials from the site display shell pendants that once covered the pelvic area of three local youngsters, all of whom died during the early portion of the Terminal Classic period (Yaxuná IVa, AD 700–850; see chapter 6 of this volume). Their estimated ages at death range from four to fifteen years. The oldest one was sexed as probably female, which resonates with Bishop Diego de Landa's description of native Yucatecan dress codes of the sixteenth century:

> [. . .] the little girls wore a thin cord around their loins, very low, and to this was fastened a small shell which hung just over the sexual parts; and it was thought a sin and a very dishonorable thing to take off these two things from the little girls before their baptism, which was always administered between the ages of three and twelve; and they were never married before being baptized. (Tozzer 1941:102; see also Stanton et al. 2010:140)

Likewise, little do we know about the local inhabitants' natural features beyond the fact that their physiognomy fits in with those of pre-Hispanic Maya populations. Such are the estimated body heights among living adults, which match the pre-Hispanic Maya average for males while being on the low end among Yaxuná's women, as discussed in chapter 3. Apart from size, the proportions of skeletal features, reconstructed from sufficiently preserved skulls and long bones, represent a robust build among adult males and a medium to gracile complexion among females. In the skull, the preserved nasal features (N = 3) of the series represent a population with medium-proportioned noses (mesorrhine, not narrow nor broad or flat) with relatively high eye sockets (N = 6).

HEAD SHAPING AND LOOKS AT YAXUNÁ

Permanent modifications of body insignia and specifically of the head were widespread among ancient Maya communities and went beyond the body surface, implicating the very shape and morphology of teguments. Scarifications, still used as a method of permanent skin ornamentation among some traditional societies in sub-Saharan Africa, for instance, are also well represented in the corpus of Classic period looted Maya figurines. Many of them had no doubt been deposited and looted on the island of Jaina (Schele 1997), although the probable place of production is the Jonuta region, now in the Mexican state of Tabasco. One finds evidence of dotted or linear scars and large perforation of ear lobes and nasal membranes, just as dental reductions by filing and incrustation dominated the appearance among youngsters and adults. Even infants were subject to body modifications, of which head shaping has been dominantly described in the literature. This morphological change was achieved in the little ones by way of head compression, constriction, or massages before the cranium hardened and the change became permanent (Dembo and Imbelloni 1938; Dingwall 1931). The resulting artificial cranial vault modifications are usually readily recognized in the skeletal material and sometimes emphasized by headdress and coiffure in the iconography.

HEAD SHAPING, UPBRINGING, AND BECOMING MAYA

Head modeling has been enacted all over the world for a plethora of motives that abide by culturally constructed ideals of beauty, group affinity, gender identity, ethnicity, and sometimes social distinctions. As a matter of fact, head shaping constitutes one of the most ubiquitous biocultural practices of the past, which has been documented in all continents. For the ancient Maya it was not only the cultural head profile that mattered. The quotidian measures enacted on newborns, infants, and toddlers were imbued with social significance just as much as the visible form they imprinted on their human bearers (Duncan and Hofling 2011; Tiesler 2012). In the able hands of female caretakers, head-modeling traditions were acted out most likely in the secluded domestic sphere of family houselots, the expertise passed on by generations of mothers, midwives, and older female kin. This characteristic clearly embraces the conservative quality of head modeling gear and techniques, beyond the more spurious fads of hair arrangements and dress.

From the early years of the Formative period to its cultural development over four thousand years, infant head crafting ties into a unified, yet evolving, system of native beliefs about the cosmos, the body, and personhood. As in other parts of the Mesoamerican world, people of the Maya lowlands perceived the head with its sensory outlets and conduits as the principal gateway of communication with the extrinsic world. From the vantage of modern ethnographic observation (Duncan and Hofling 2011), within this scheme young children were deemed especially vulnerable to suffer from the loss (or sometimes excess) of vital energy, spoken of as the "heat," which was still not firmly anchored or balanced in their bodies. The "soft" fontanels and the occipital bun were held to be at risk of losing (sometimes exceeding) the balanced proportion of vital heat, thus hampering organic functioning.

Appropriate measures aimed at balancing the baby's spiritual energies were initiated right after birth. Contact period Yucatecans referred to this process as *up' k'abtah*, which translates as "straightening out the head of the newborn in order to mend or to adapt it" (Barrera-Vásquez 1938:901). These procedures could last for weeks, months, and sometimes years. Female kin undertook the responsibilities for swaddling, bandaging, or massaging for the purpose of head shaping, or adjusting hard compression devices until the change had become permanent and the fontanels had "dried" (Duncan and Hofling 2011; Tiesler 2014). In fact, head shaping was only one of several preparatory measures that enabled the infants to become people in their own right. Communal integration was not consecrated ceremonially until stages of infancy and childhood, culminating in a series of passages, such as *hetzmek* ceremonies, name-giving rites, or first haircuts.

At least during the Classic period, and given the noted diversity among artificially reproduced head profiles, we are able to trace different head-shaping traditions on a family, community, and regional level. Although no direct correspondence between specific head form and individual social standing can be made out,[1] head form, by itself, expresses *long-durée* body traditions and techniques. The Formative and Classic Maya landscapes are especially noted for the diversity of head shapes with their kaleidoscope of elongated, inclined,

FIGURE 5.2. Woman carrying her baby. The head of the baby is strapped into a head device, made of a ventral compression plane and possibly two lateral boards (Museo del Popol Vuh, Guatemala).

heightened, shortened, or broadened cranial contours, a systematic survey of which has been the focus of other works (Tiesler 2012, 2014; figure 5.2). At least before the Postclassic period, the visual outcomes of head treatments held ascribed meanings for their human carriers across and beyond the Maya hemisphere, which could have been impregnated with the idea of emulating local or regional patron deities, like God L, the old deities, or the Maize God (García-Barrios and Tiesler 2011).

STUDYING HEAD SHAPING AMONG YAXUNÁ'S INHABITANTS

In this section, we will trace head profiles recorded among the skeletal individuals from the settlement and beyond. For regional comparison we use a systematically scored sample just short of 1,000 coeval Maya crania from the Yucatecan shelf. The analysis of head morphology rests on macroscopic observation in all sufficiently preserved skullcaps, assisted by measurements when possible. A convenient proxy for exploring culturally conferred head forms is the taxonomy of cranial vault shapes, previously adjusted to Mesoamerican skeletal populations (Romano 1965). This taxonomy allows us to associate specific head-shaping devices (or their combinations) with the resulting head morphologies. In the case of the Maya, these compression materials usually were part of cradleboards and head splints, sometimes used together with tight wraps (figure 5.3).

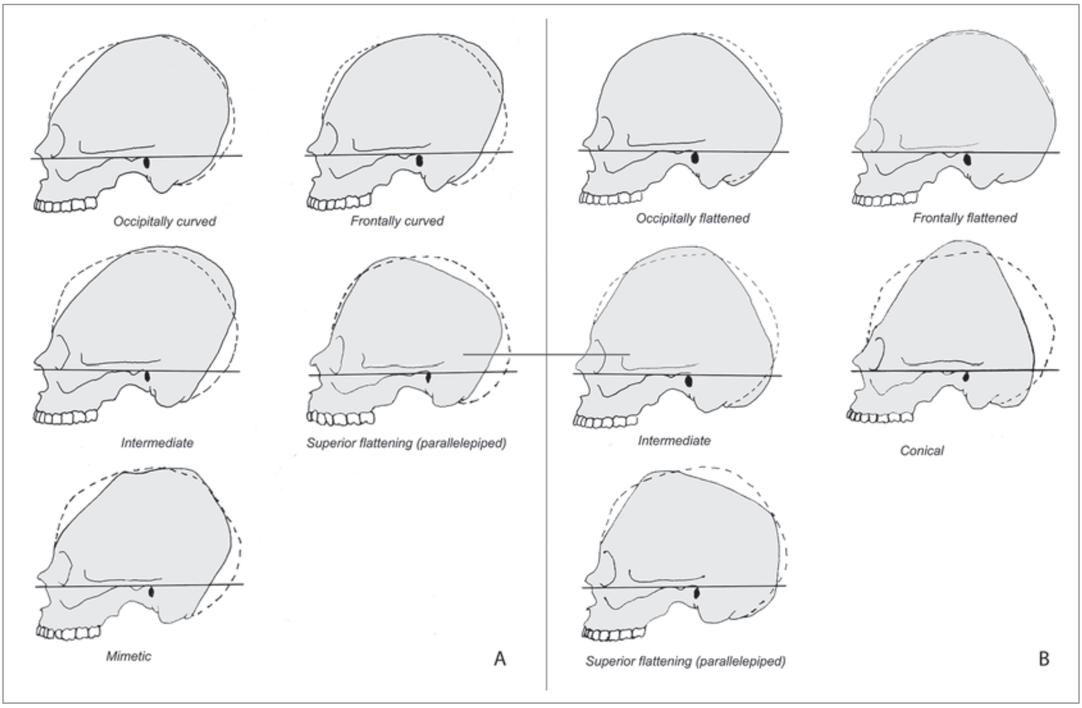


FIGURE 5.3. Different head shapes documented across the Maya area during the Classic period: (a) using head splints (tabular oblique shapes); (b) using cradle devices (tabular erect shapes).

Cradleboard use leads to head shortening and broadening (when not combined with tight horizontal wraps). The resulting head form has been coined "tabular erect" first by Imbelloni (figure 5.3; Dembo and Imbelloni 1938; see also Romano [1965] and Tiesler [2012, 2014] for Mesoamerican taxonomies). Conversely, the head reclined backward as a result of splinting it between compression boards strapped to its back and front (tabular oblique type). Substantial head elongation was achieved when the boards were tightly wrapped or when its circumference was additionally bound with cloth. Thus, the cranium (and therefore the head in the living) could acquire a tubular form, as the hairline of its narrowed forehead was dramatically pulled back (figure 5.4).

Secondary effects to severe procedures were not so much related to health risks (although they must have existed) but to morphological adjustments of the face, which by themselves must have been desirable to the eyes of the native. While the circumferential pressure forced neurocranial expansion toward the back, it caused the face to expand outward. This led to out-thrusting cheekbones, to buccal prognathism, and nasal protrusion often coupled with the elimination of the nasal notch (see chapter 3 of Tiesler 2014 for extensive discussion and citations of relevant literature). Note that these artificial features were highlighted and often exaggerated among the scribes and artists of Classic period courts, probably signaling desired traits and beauty in the eyes of the ancient artisans (Sánchez 2008; figure 5.4).

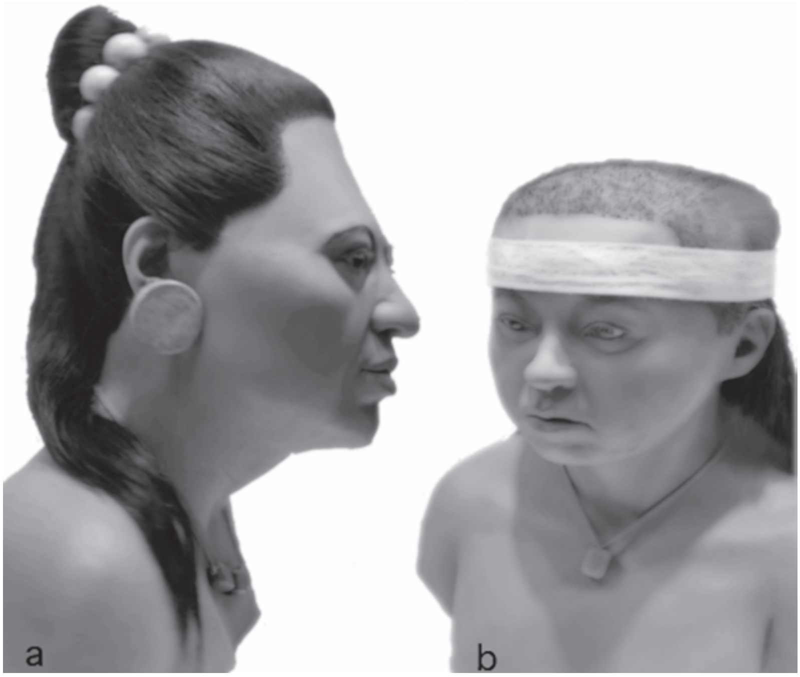


FIGURE 5.4. Three-dimensional facial reconstructions of (a) Maya female with elongated, reclined head profile and a narrow forehead, and (b) a youngster with a top-flattened head who came to rest in the Sacred Cenote of Chichén Itzá, at some 18 km from Yaxuná (photos by S. Suzuki, Exhibit of Gran Museo de la Cultura Maya, Mérida).

TRENDS

Yaxuná serves as a convenient proxy to explore the head-shaping traditions in the Yucatán Peninsula before the Maya collapse (table 5.1; figure 5.5). The Classic period sample from the site adds up to 26 preserved crania, of which 21 show artificial flattening (80.8%) (one skull could not be assessed for artificial modification). Tiesler does not believe that this percentage automatically means that the remainder had not been modeled during infancy, but she suggests instead that the physiologically shaped individuals had not experienced the compression effect for a sufficiently prolonged period of time to leave permanent traces in their growing cranium.

We could not document any substantial shift in compression techniques throughout the centuries; instead, many aspects point to continuity in the local family head-modeling traditions. Without being able to generalize further for lack of a larger sample, we note for instance that all three scored individuals from the 5E-103/105 residential group (Yaxuná IVa) sported splinted, reclined head shapes (Burials 1, 4, and 8; see table 5.1 and figure 5.5). The elite occupants of the tomb chamber of Burial 24 displayed artificially broadened and shortened head profiles (Burials 24-7, 24-11, and 24-14). This, once again, seems to indicate that head shape expressed family traditions more than an overarching code of desired modeling techniques or kits.

TABLE 5.1. Classic period burials with available information head shaping.

BURIAL	LOCATION	CHRON. RANGE	PROV.	STATUS	SEX	AGE	PRES	DEGREE (0–4)	TYPE	VARIETY	BANDS
23	Str. 6F-3	Yaxuná IIa	LOC	4	M	MAd	Yes	1.25	Tabular	Frontal	Circular Sagital
24-1	Str. 6F-4	Yaxuná IIb	LOC		F?	YAd	Yes		Tabular		
24-3	Str. 6F-4	Yaxuná IIb	REG		—	Child	No	0?			
24-4	Str. 6F-4	Yaxuná IIb	LOC		M?	Adolesc	Yes		Tab. erect		
24-5?	Str. 6F-4	Yaxuná IIb	LOC	3	F	MAd/OAd	Yes	1.25	Tabular	Mimetic	Sagital
24-6	Str. 6F-4	Yaxuná IIb	LOC	3	F	Adolesc	No?				
24-7	Str. 6F-4	Yaxuná IIb	LOC	3	M	MAd	Yes	1.25	Tab. erect	Intermediate	
24-10	Str. 6F-4	Yaxuná IIb		3	F?	Adolesc	Yes		Tabular		
24-11	Str. 6F-4	Yaxuná IIb	LOC	3	M	YAd	Yes		Tab. erect		Sagital
24-14	Str. 6F-4	Yaxuná IIb	LOC	2	M?	MAd/OAd	Yes	0.75	Tab. erect	Intermediate	
5	Str. 5E-59-Sub. 1	Yaxuná III	LOC	1	—	Child	Yes				
14	Str. 4E-22	Yaxuná III	LOC	3	M	YAd/MAd	Yes	0.5	Tabular	Irregular	Sagital
28 ('11)	Str. 6E-32	Yaxuná III		1	M	MAd	Yes	1	Tab. erect	Lambdic	Sagital
27 ('11) (27-1)	Shelter Str. 6F-4	Yaxuná III	LOC	0	M	YAd	Yes	2.5	Tab. erect	Intermediate	
27cr. ('11) (27-2)	Shelter Str. 6F-4	Yaxuná III	FOR	0	F?	Adolesc	Yes	3.5	Tab. oblique	Extreme	Circular
20	Str. 6F-4	Yaxuná III	FOR	1	F	OAd	Yes				
26-cr.	Shelter Str. 6F-4	Yaxuná IV			M?	Adult	No	0?			
1	Str. 5E-103	Yaxuná IVa	LOC	1	—	Child	Yes	2	Tab. oblique?		
4	Str. 5E-105	Yaxuná IVa	LOC	1	F?	Adolesc	Yes		Tab. oblique?		
7	Str. 6E-58	Yaxuná IVa	LOC	1	M?	YAd/MAd	Yes		Tab. erect	Frontal?	Sagital
8	Str. 5E-103	Yaxuná IVa		1	F	MAd	Yes	1.75	Tab. oblique	Mimetic	Circular
13A	Str. 4E-20-2	Yaxuná IVa	LOC	1	M	Adult	No	0?			
13B	Str. 4E-20-2	Yaxuná IVa	REG	0	M	YAd	No	0			
15A	Str. 5F-49	Yaxuná IVa	LOC	1	M	YAd	Yes	2.5	Tab. erect	Intermediate	Sagital
16	Str. 6F-43	Yaxuná IVa	REG	1	M?	Adult	Yes		Tab. oblique?		
22	Str. 6F-12	Yaxuná IVa		0	M?	Adolesc/YAd	Yes				
10	Str. 6F-9	Yaxuná VI	LOC	0	F	Adolesc	No	0			

M = male, M? = probably male, F = female, F? = probably female; perinatal (0 yrs.), infant (0–3 yrs.), child (3–12 yrs.), adolescent (12–20 yrs.), young adult (20–35 yrs.), middle adult (35–50 yrs.), old adult (over 50 yrs.)

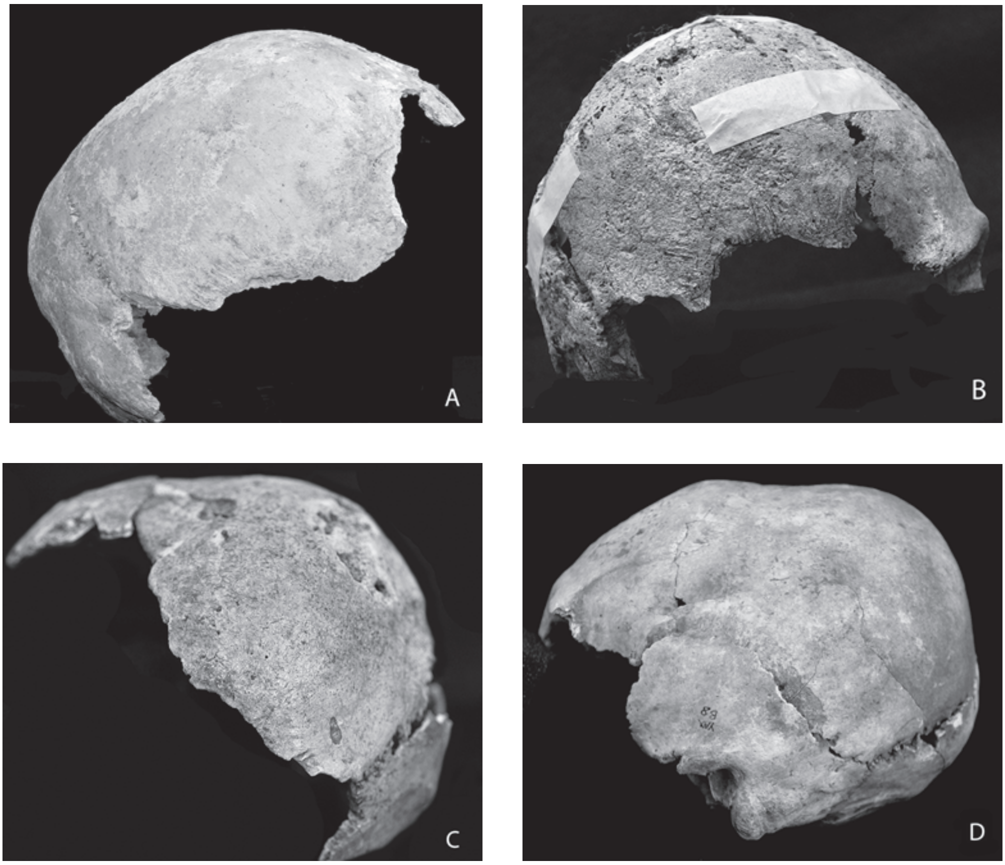


FIGURE 5.5. Modified crania from Yaxuná according to chronological phase: (a) slightly flattened cranium of Burial 24-4 (Yaxuná II); (b) Burial 14: local male with shortened head from cradling (Yaxuná III); (c) male local adult of Burial 7, dated to the Late Classic period (Yaxuná III). Note the strong post-coronary groove and inclined forehead; (d) Late Classic female adult of Burial 8, dated to the Late or Terminal Classic period, displaying a strong post-coronary sulcus and a strongly inclined forehead (Yaxuná IVa) (Yaxuná, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

Overall, the morphological changes are moderate in those who underwent this practice during infancy (figure 5.5). One particularity of local practitioners relates to their extensive use of sagittal bands as part of the compression kits. And, in contrast to other coeval settlements from the Yucatán Peninsula where prominent frequencies of suprainial pitting on the back of the skulls hint at direct manipulation of this anatomic segment, no such pitting could be made out in the skeletal series from Yaxuná. Here, most of the infant heads were compressed inside cradleboards (tabular erect type) and were slightly to moderately slope-sided (asymmetric). This often-witnessed side effect has to do most probably with the involuntary slipping of the compression planes of this multipurpose kit, which served as a permanent sturdy frame for fastening the baby while keeping it warm, clean, and nursed.

After taking a look at other Classic period inland series from Yucatán, it is clear that the variety of head profiles of Yaxuná resembles the variability of other coeval populations, such as those at Dzibilchaltún or Xuenkal, among whom seven out of eight crania displayed different culturally produced morphological changes. Note that the settlement populations from the Puuc area show a slightly higher rate of shaping frequencies when compared to Yaxuná, with 23 of 25 individuals having been modified in our Classic period series from Chac II, Oxkintok, Kabah, Labná, and Sihó (92%); however, frequencies are not statistically significant (Fisher's exact text, $p = 0.4189$) and no substantial difference in compression apparatuses is noted. Until the end of the Classic era, the use of cradleboard devices versus head splints remains approximately balanced in the Puuc area and really across the northern plains. To the east of Yaxuná lies Cobá, where we recorded five shaped crania out of six (Tiesler 1998, 1999). Just like the ancient inhabitants of Yaxuná, the residents of Cobá (who died during the Late and Terminal Classic) carried slightly to moderately cradled or splinted head forms.

Yaxuná compares similarly in this regard to individuals from 19 other Classic period inland settlements, which together have a proportion of 89% of shaped skulls ($N = 119$).[2] Both shortened and reclined head shapes are found across the peninsula with a host of intermediate and pseudocircular forms, some with slight posterior or frontal flattenings. Conversely, no cases of superior flattening were scored in the way documented at Chichén Itzá or along the Yucatecan coastline (Tiesler 2015). As noted at Chichén Itzá, after the Puuc boom, uniformly shortened (figures 5.6a and 5.6b) or top-flattened (figure 5.4.b) head shapes express a more homogeneous use of cradleboards, as described in chapter 9 (Tiesler 2012, 2015). Similar to the looks of an isolated skeletal deposit recovered at a ritual rock-shelter on the North Acropolis (Burial 27 [B27-1]; figure 5.6a and b; see also chapter 8), the new choices in head shapes at Chichén Itzá materialize a dramatic departure from the previous centuries of infant care and head shaping. We believe this to indicate important ideological transformations, most likely in line with a new westward oriented, Kukulkán-affiliated Mesoamerican ideology that roughly correlates in time with the decline and fragmentation of the major centers further south.

At least during the first millennium AD, the modeling techniques of inland Yucatán appear to be analogous in the frequency, type, and degrees of modification to those viewed in northern and central Petén further south (as documented at Calakmul, Dzibanché, Kohunlich, and Uaxactún; Tiesler 2014) but are scores apart from the extreme head shapes among western lowlanders. This observation deserves attention concerning an isolated, extremely elongated human cranium, recovered at the North Acropolis (Burial 27 [B27-2]; figure 5.6c; see also chapter 8) and belonging to a person who was likely born and raised far from Yaxuná, much further southwest in the Maya lowlands as her isotopic signature suggests (see chapter 2). This skull was protected thanks to the deep layer of sandy soil that kept it dry beneath an overhanging rock, and shows an extraordinary degree of preservation, just as the head of a full-bodied assemblage interred next to it (figures 5.6a and 5.6b; Herrera 2014). This head was deposited in a skeletonized state and without its mandible. The deposit occurred sometime

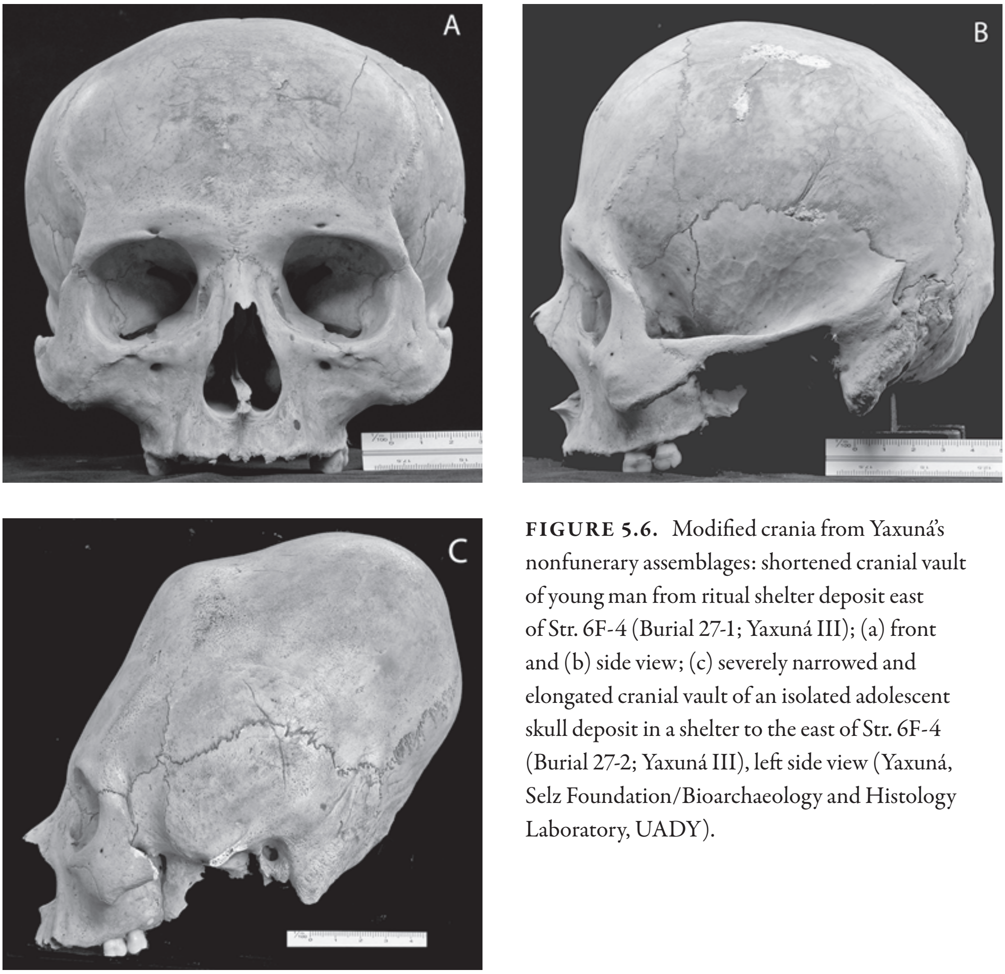


FIGURE 5.6. Modified crania from Yaxuná's nonfunerary assemblages: shortened cranial vault of young man from ritual shelter deposit east of Str. 6F-4 (Burial 27-1; Yaxuná III); (a) front and (b) side view; (c) severely narrowed and elongated cranial vault of an isolated adolescent skull deposit in a shelter to the east of Str. 6F-4 (Burial 27-2; Yaxuná III), left side view (Yaxuná, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

during the Late Classic period (Yaxuná III), considering the associated ceramic wares (Stanton and Marengo Camacho 2014). The remains once belonged to a diseased foreign-born female individual who had died in her teens.[3]

Her severely narrowed and elongated cranial vault had been splinted well past her first year of life and past the closure of her anterior and posterior fontanels, leading to the two sulci above the coronary and lambdic sutures. Both compression tablets must have been wrapped tightly, causing the extreme narrowing of her already reclined head (figure 5.6c; see also figure 5.2 for a likely implement). As her neurocranium grew backward, her face gradually protruded (figure 5.7).

The face of this foreign-born teenager is brought to life by forensic artist Érika Meijide Jansen, who used standard measurements of tissue thickness referenced for Mexican female population (Escorcia y Valencia 2003; Valencia y Escorcia 2003). Her estimation of nose projection followed the method proposed by George (1987). Eyeball protrusion was calculated

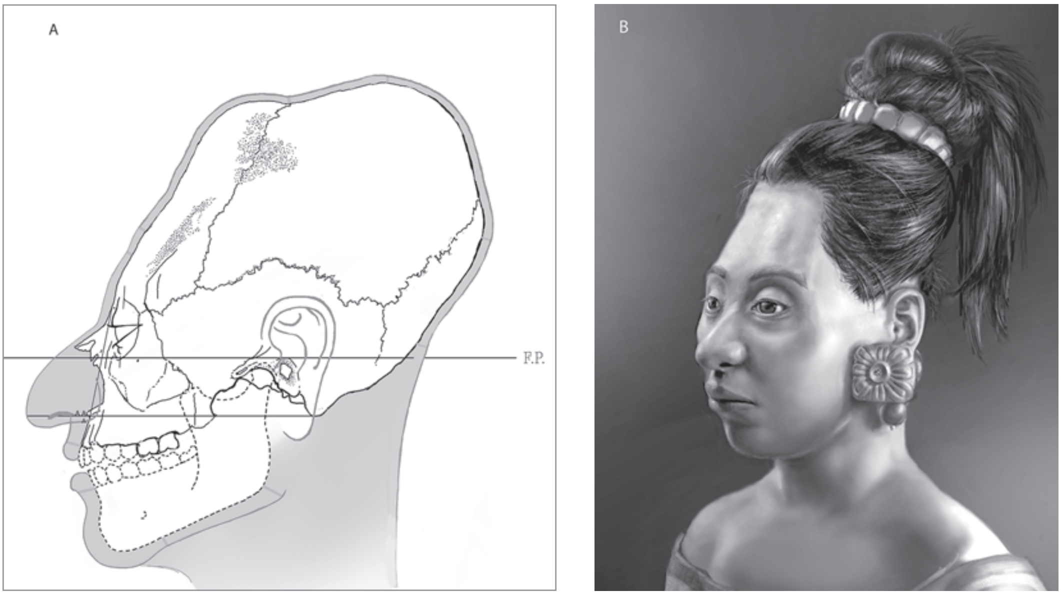


FIGURE 5.7. (a) Forensic tracing of head contours of female teenager [B27-2] with severely narrowed and elongated head. (b) Hypothetic portrait of [B27-2]. Note the outthrusting cheek bones, the towering nose, the prognatic bucal area, and narrow forehead (drawings by Érika Meijide Jansen).

by using measurements presented by Taylor (2001). The artistic rendering of the face was also founded on the individual's estimated age at death and ethnic features, as displayed by Jaina figurines and similarly aged modern Lacandon and Yucatec Maya faces. The final look is similar to a previously elaborated head sculpture crafted by artist anthropologist Mirna Sánchez.

The forensic drawing insufflates this ancient Maya girl with life and at the same time showcases the morphological effects of prolonged headsplinting. Such features are the midface prognatism as expressed by the prominent nose and the prognatic alveolar portion of her face. The cheeks are voluminous and outthrusting and her eyeballs protrude slightly. A narrow forehead fronts her elongated, reclined head profile. These traits, together with her half-closed eyelids, appear in most Classic period portraits and were considered beautiful in all likelihood.

The culturally elongated capital features of Burial 27 (B27-2) were especially in vogue along the southern Gulf Coast area and across the western Maya lowlands during the Classic period. They recall the portraits with tubular head profiles along the Usumacinta Basin, down toward the Chontalpa and out to the coast, east and west, toward Jaina and Veracruz. These areas are known iconographically for their stylish headwears and extreme head elongations (Miller 1975; Schele 1997; Scherer 2015; Tiesler 2014). This combined perspective (i.e., the isotopic signature and the extreme head form of the teenager) suggests that the original whereabouts of [B27-2] should be found much further southwest of Yaxuná and down the west coast of Yucatán, toward the areas of the Chontalpa and Usumacinta Basin, where extreme head elongations were common practice during the first millennium.

PRECIOUS SMILES: DENTAL WORK AT YAXUNÁ

DENTITIONS AS GATEWAYS OF VITALITY AND THE SACRED

Although slightly less common than head shaping and identified almost exclusively with adults, Maya dental modifications, just like head shaping, express long-standing beliefs about the body and its cultural embodiment (Fastlicht 1948; Mata 1993; Romero 1951, 1952, 1958, 1970, 1986; Scherer 2015; Tiesler 1999, 2000b). Karl Taube (1998; 2004b:290; see also Houston and Taube 2000) mentions cloud scrolls "turned-into-serpents," which are seen emanating out of buccal corners in Classic Maya portraiture, where they sometimes rim the upper and the lower teeth. Situated at the entry of the mouth past the lips, frontal teeth were natural gateways for the Maya. The breath passed though this threshold during inhalations and exhalations, including the uttering of sounds and the spoken word. Teeth themselves were likened to maize kernels among Contact period highland Maya, a notion reflected in the K'iche myth of the Popol Vuh (Christenson 2007; Tedlock 1996).

A number of monumental façades of Río Bec and Chenes-style palaces display doorways as open mouths and equip them with inverted *ik'* "wind" or "breath" signs, fashioned out of stucco. Either upright or inverted, these "T" shapes identify wind and scent in the Maya territories (Houston et al. 2006:145–147). Further north, the central doorway of Structure 1 at Ek' Balam leads to a dynastic tomb of Ukit Kan Lek' Tok. Like its southern Yucatecan counterparts, it is represented as a wide-open jaw, although lined by pointed teeth instead of *ik'* shaped pieces, more resembling the dentition of different faunal species, which have been compared and described systematically by Montiel (2012; Grube et al. 2003; Montiel et al. 2006).

Besides, or in addition to, granting frontal dentitions with agreeable contours and symbolic weight, they could also be inlayed with colorful stones and thus made precious; incrusted stones were carved out of green jadeite, black pyrite, reddish hematite or, in later periods, blue-green turquoise. As Taube (1998) suspects for the Maya elites, these modified buccal portals were likely insufflated with the pure and the precious, procuring spiritual vitality of buccal emissions for the individual carrier of these dental plugs. The skeletal record of the Maya lowlands confirms this notion for the Classic period and adds information by establishing dental incrustations as a tradition that spread beyond the bounds of urban elites (Romero 1958; Tiesler 1999, 2000b).

Different forms of tooth display are recognized from Maya anthropomorphic and sacred portraiture. The significance of tooth display is highlighted by the Classic period name of a primary creator deity: Hun Yeh Winik, One Tooth Person (Stuart 2014). He is also known in the literature as God I of the Palenque Triad (Stuart 2005:168). David Stuart now identifies this deity with the sun reborn in the east emerging from the Caribbean Sea and demonstrates the prominent cuspid in his upper jaw to be a shark's fang. This is the τ-shaped tooth in its original form, and only later in Maya use would it take on the connotation of living breath.

This shark's tooth is an idea and image that is associated with the death shark deity of Middle Formative Olmec religion (Coe 1973: figure 2). Seventh-century mourners at the site of El Perú-Waka' in northwestern Petén put a Middle Formative Olmec-style serpentine heirloom figurine (Rich et al. 2010) in a royal tomb (figure 5.7). This figurine was possibly carved and used in the Maya area and not imported from the Gulf Coast heartland of the Olmec society, as the deity combines the tooth, eyes, and fin of the Olmec death shark with the clefted celt crown elements and trefoil jewel of the Maize God. It is, in any case, a visual and conceptual segue from the reference to the shark tooth as a symbol of death, the watery underworld, and perhaps Chaak the rain god, to resurrection, maize, and living breath. This is precisely the intention of dotting with the shark teeth in portraits of later Classic Maya sun gods.

In some Late Formative Maya contexts, such as the seven maize gods depicted in the Pinturas building at San Bartolo in northeastern Petén (Taube et al. 2010:figure 8), the frontal tooth is clearly a double fang, possibly referencing a serpent, as we have discussed above. The serpent appears in this sacred panorama as a pervasive symbol of supernatural conduit associated with breath. Indeed, the Olmec-style heirloom figurine from El Perú-Waka' displays incised breath cords emanating from the nostrils that have the brows of serpents. Prominent double incisors signal images of the Early Classic Maya Maize God, and the shaping of the upper incisors into the τ-tooth design emulates the double tooth depictions of the Maya Maize God from the Late Formative through the later Classic periods. The Maya varied this idea with multiple τ-shaped teeth and other patterns. Yet in general, the objectives of dental ornamentation were likely not only aesthetic but devotional.

MAYA DENTAL WORKS AMONG HUMANS

The dental remnants of skeletons, buried in the Maya territories, indicate that the majority of Classic period adults had their teeth modified by filing, incisions, or drilling during or after concluding their second life decade (Tiesler 2000b). Filing and particularly the grooving of the incisal borders were generally preferred among women, while inlays prevailed among males and are limited mainly to the Classic period. When considered jointly with other indicators of the cultural record, *ik'* styles and inlays appear more frequently among privileged burials than in less elaborate mortuary contexts. This said, no technique or pattern is exclusive of either sex or social sector, identifying this practice more as a general choice in looks than a dividing gendered or status-related tradition (Tiesler 2000b).

For the work on Yaxuná, we scored all erupted permanent and deciduous teeth from Yaxuná. Dental surfaces were systematically inspected and scored for fresh or remnant striation, polish and/or reduction by filing, grooving, or drilling. Our formal and technical classifications follow the taxonomy by Romero (1951, 1952, 1958, 1986) and Tiesler (2000b) (plate 5.1). A categorical distinction was made by the tooth and according to dentitional patterns, translating individually reduced teeth into socioculturally relevant sets of teeth. Here we distinguish between grooved dental arches (A), sawlike pointed contours (C), laterally filed (Ik), and notched (B5) dentitions as well as inlays (plate 5.1). Apart from these patterns, we registered dental arches that had been worn down homogeneously, not by occupation, but apparently on purpose, leaving a regular (although orthodontically malfunctioning) elliptic gap between the upper and the lower line of frontal teeth. For each individual we

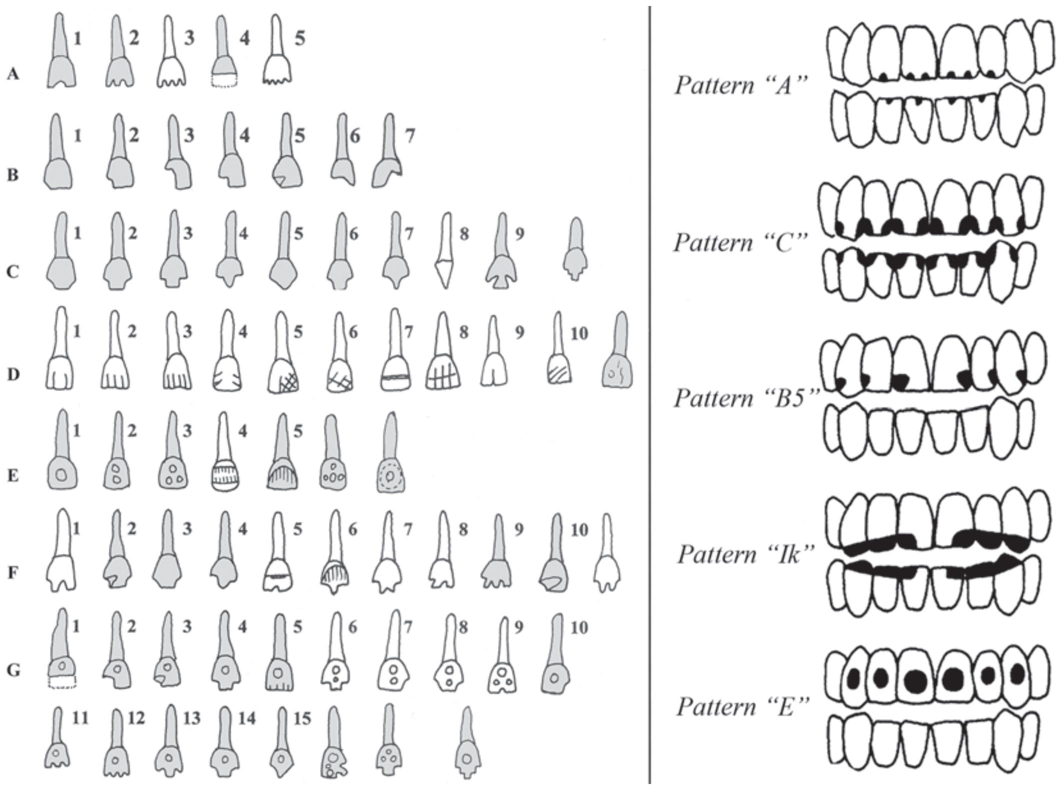


FIGURE 5.8. (a) Taxonomy of artificially modified teeth with numbers referring the original count by Romero; presence of type in the Maya area appears highlighted in gray (Romero 1984 a, 1984b; adapted by Tiesler 2000, Ramírez 2016); (b) visual dentition patterns (Tiesler 2000b; see also Romero 1952).

recruited the contextual information incuding a set of correlates for social adscription (Krejci and Culbert 1995; Tiesler 1999:106), with composite status scores in the range of 0 (lowest) to 5 (highest).

Digital radiographic images were obtained in seven inlayed teeth, using a Genoray® portable radiographic system, equipped with an Owandy® radiovisiograph. Measures included perforation depth relative to the dentine and pulpal chamber, number of perforations, and presence versus loss of inlay. We also scored the severity of physiopathological pulp reactions along with carious infections directly related to the inlays, loss of structural integrity of the enamel according to root canal calcifications, and internal root resorption.

TRENDS IN LOCAL DENTAL DECORATIONS

For the purposes of this review, we scored some 25 sets of erupted permanent teeth from Yaxuná, of which 14 showed artificial reductions of the enamel, the dentine, and in rare cases also penetration of the pulpar chamber (table 5.2). Note that three additional sets of erupted

TABLE 5.2. Classic period burials with available information on dental modification.

BURIAL	LOCATION	CHRON. RANGE	PROV.	STATUS	SEX	AGE	DECORATION	PATTERN	TECHNIQUE
23	Str. 6F-3	Yaxuná IIa	REG	4	M	MAd	Yes	E	Jadeite inlay? Maintenance, polish
24-1	Str. 6F-4	Yaxuná IIb	LOC	3	M	MAd	Yes	Ik/B5	Recent filing, occupational wear
24-5	Str. 6F-4	Yaxuná IIb	LOC	3	F	MAd/OAd	Yes	E	Inlay fallen out
24-6	Str. 6F-4	Yaxuná IIb	LOC	3	F	Adolesc	Yes	Ik/B5	Recent filing, maintenance
24.11	Str. 6F-4	Yaxuná IIb	LOC	3	M	YAd	Yes	Ik/B5	Filing
24-14	Str. 6F-4	Yaxuná IIb	LOC	2	M?	MAd	Yes	IK	Filing
5	Str. 5E-59-Sub. 1	Yaxuná III	LOC	1	—	Child	No		
14	Str. 4E-22	Yaxuná III	LOC	3	M	YAd/MAd	Yes	E	Pyrite inlay, maintenance, polish
27 (2011) (27-1)	Str. 6F-4 Shelter	Yaxuná III	LOC	0	M	YAd	No		
12	Str. 4E-22	Yaxuná III	LOC	1	F?	Adult	No		
20	Str. 6F-4	Yaxuná III	FOR	1	F	OAd	Yes	A4	Homogeneous reduction of anterior maxilar dentition
21	Str. 4, Xkanha	Yaxuná III	REG	1	—	Adult	Yes	C?	Filing
1	Str. 5E-103	Yaxuná IVa	LOC	1	—	Child	No		
8	Str. 5E-103	Yaxuná IVa		1	F	MAd	Yes		Filing
13A	Str. 4E-20-2	Yaxuná IVa	LOC	1	M	Adult	No		
13B	Str. 4E-20-2	Yaxuná IVa	REG	0	M	YAd	Yes	E	Pyrite inlay, maintenance, polish
13C	Str. 4E-20-2	Yaxuná IVa		0	M?	Adult	Yes	E	Inlay
15A	Str. 5F-49	Yaxuná IVa	LOC	1	M	YAd	No		
15C	Str. 5F-49	Yaxuná IVa		1	—	Adult	Yes	C	Recent filing
17	Str. 6F-43	Yaxuná IVa		0	M?	Adult	Yes		
18A	Str. 6F-73	Yaxuná IVa	LOC	1	—	Child	No		
9	Str. 5E-77	Yaxuná IVa	LOC	1	—	Child	No		
19	Str. 6F-3	Yaxuná V	LOC	1	M	MAd	No		
10	Str. 6F-9	Yaxuná VI	LOC		F?	Adolesc	No		

M = male, M? = probably male, F = female, F? = probably female; perinatal (0 yrs.), infant (0–3 yrs.), child (3–12 yrs.), adolescent (12–20 yrs.), young adult (20–35 yrs.), middle adult (35–50 yrs.), old adult (over 50 yrs.).

infant teeth were sufficiently preserved for dental scrutiny, but none of these deciduous dentitions displayed any particular morphological features to suspect artificial modification.

All documented dental modifications had been conducted in individuals who lived and died during the Classic period (N = 23), implying that over half (60.9%) of the population past childhood carried artificially altered dentitions at Yaxuná. Five of these dentures had been drilled to be inlayed, while nine more had been filed down in a flat, pointed, grooved, or *ik'*-like fashion. The comparison between males and females shows modifications to be approximately proportional, except for dental inlays, which were sported in four males versus only one female. Although reduced in sample size and biased toward the large group of transformed dental arches of the many occupants of Burial 24, some trends are slightly suggestive. Such is the higher average status score among individuals with dental work in the Ik/B5 and E patterns ("2.25" of [0–5]; N = 8) versus those with either no dental work or dental grooving and pointed teeth ("1" of [0–5]; N = 14). This pattern reflects the trends documented in an earlier regional study of Classic Maya dental work (Tiesler 2000b:73–80).

Confronting the dental work with the chronological ranges of Yaxuná's burial record, the two chamber tombs of the Early Classic dominate this period's sequence. In particular, the dynastic occupant of Burial 23 (figures 5.8 and 5.9) showcases the extremes to which some Maya rulers went to enhance their looks and smiles during public appearances, just as the following reconstruction highlights (Ramírez 2016). The mature royal of Burial 23 had each one of his upper incisors drilled and inlaid long before his death, most probably already as a young adult (Tiesler 2000b:64–65). While the upper incisors were colorful, no canine or lower incisor was touched. At least one jadeite stone was documented by the excavators in situ, still clinging to the alveolar area. The only preserved tooth of this row shows a hollow of extraordinary proportions, covering most of its labial surface, with fissures opening the aperture toward the lower border (figure 5.8 and figure 5.9).

We assume from the chronic oral conditions that after the initial operation, all of the inlays must have suffered from the wear and tear of biting with a set of malfunctioning incisors, perhaps also from the infiltrations through the sealing material. The latter may have led to massive infections of the gum and the osseous alveolar mass above the maxillary incisors (figure 5.9b). The upper right central incisor of Burial 23 was fractured at one point and its root canal exposed (figure 5.9a), while the two lateral incisors fell out or were pulled. This tooth decay is premature, given that the remainder of the teeth, all of which were unaltered, were still in their sockets at the time of death. An X-ray of the corresponding alveolar area provides further glimpses into the pathological mechanisms at work. It shows infectious reabsorption and remodeling with a cyst sitting just above the lost lateral incisor, as to suggest an apical abscess was to blame for its loss. Of note is the chronic affliction caused by the dental inlays in this dignitary and the maintenance that was conducted on the upper arcade. The left and right upper canines were filed down to assimilate the tooth decay and loss of the central pieces, still displaying regular striation remnants in a mediolateral direction. The remainder of the arcade shows much less wear.

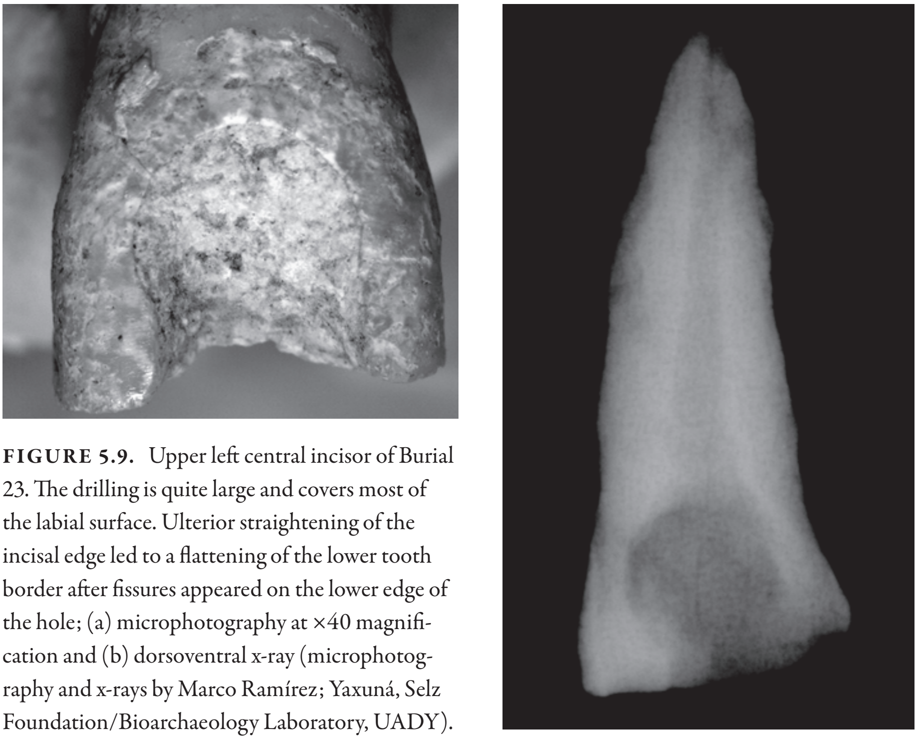


FIGURE 5.9. Upper left central incisor of Burial 23. The drilling is quite large and covers most of the labial surface. Ulterior straightening of the incisal edge led to a flattening of the lower tooth border after fissures appeared on the lower edge of the hole; (a) microphotography at ×40 magnification and (b) dorsoventral x-ray (microphotography and x-rays by Marco Ramírez; Yaxuná, Selz Foundation/Bioarchaeology Laboratory, UADY).

Burial 24 dates to the Early Classic period, although slightly later in time, and contains information about the dental enhancement of its occupants (figure 5.10). Only locals were available for this round of analyses, namely Burials 24-1, 24-5, 24-6, 24-11, and 24-14. Note that the middle-aged adult represented by the remains of Burial 24-1 displays a homogeneous reduction of his mid-maxillary dentition. This abrasion must have occurred not long before death, as expressed by fresh transverse horizontal grooves. These homogeneously flattened incisal edges contrast with the unworn lower denture and must have led in to an open frontal slit also with the jaws closed (figure 5.10a). This arrangement recalls the scenes of Maya breath gateways, with which we opened this chapter. Secondary dentine had formed as a consequence.

The elderly female of Burial 24 (B24-5) once sported a single inlay in both her upper central incisors; Burials 24-6, 24-11, and 24-14 all showed similar central notches in the *ik'* style, which is still highlighted by the strong flattening of the adjacent lateral pieces. The fact that the filing of Burial 24-6 still displays fresh striation marks indicates that the 15-year-old girl had just received her dental filing before passing. We assume that this operation must have been quite painful for her, given the deep grooves, which cut through the core of the central incisors in proximity to the canal root (figure 5.10b). Interestingly enough, the two remaining male individuals (Burials 24-11 and 24-14) sport an identical maxillary contour to the one described for Burial 24-6.

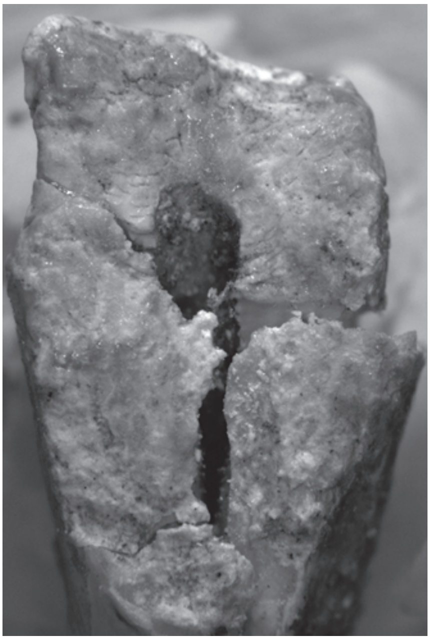


FIGURE 5.10. (a) Fractured upper right central incisor of Burial 23 with exposed root canal and subsequent death of dental organ; (b) surrounding maxillary alveolar area associated displays infectious resorption and remodeling with cyst above the lost lateral incisor, located in the upper left margin of the x-ray (microphotography and x-rays by Marco Ramírez; Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

Moving on to the Late and Terminal Classic periods, approximately half of the available locals at Yaxuná still displayed artificial tooth carving. While no *ik'* patterns are materialized in their tooth arches, single inlays and one case of maxillary dental straightening indicate continuity in local ways rather than replacement. Three additional cases of dental incrustations are documented, all from male mouths (figure 5.11). Family or residential cohesion is noted between Burials 13A and 13B, both of whom display inlays. Lastly, the spherically polished, regular stone that had been inlayed in the mouth of Burial 14 shows hardly any equivalent in the Maya area, where the great majority of inlaid pyrites have a flat, mirror-like finish (figure 5.12).

REGIONAL TRENDS AND HEALTH HAZARDS

Put into regional context, Yaxuná's Classic period population featured a similarly diverse repertoire in dental works and therefore buccal looks as found in other peninsular settlements, where over half of the adults showed artificially contoured dental arches before the onset of the second millennium AD. At Yaxuná, just as in other Yucatecan settlements, dental modifications were not limited to drilling or filing, but instead included polishes, scratching, and grooving. Maintenance measures, such as abrading the incisal edges after fractures or to harmonize with patterns obtained in adjacent teeth, should have been common. We do note, however, that even more complex and elaborated dental work was conducted, beyond doubt, by their peers further south, toward Belize, the Chontalpa, the Usumacinta, and Copán. This has been demonstrated by old and recent revelations of multiple inlays,

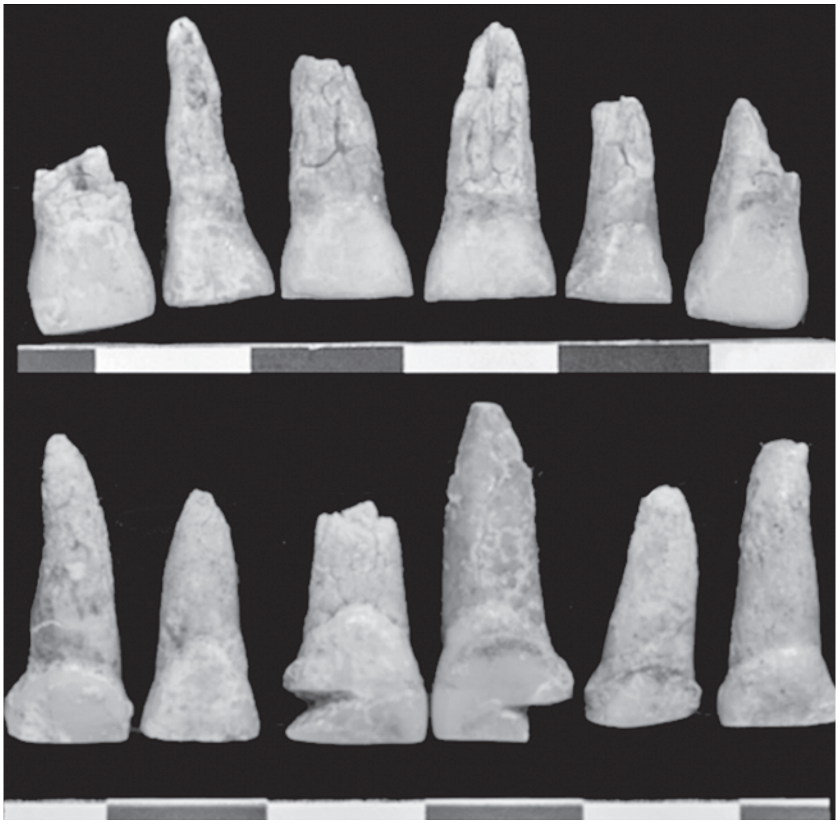


FIGURE 5.11. (a) Dental straightening in Burial 24-1; (b) filing in the "Ik/B5" pattern with deeply notched central incisors in Burial 24-6 (Yaxuná, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

fungiform incrustations, and stepped filings (Mata 1993; Romero 1984a, 1984b; Saville 1913, 1935; Scherer 2015; Tiesler 2000b).

In contrast to head-shaping, as we have demonstrated, dental work was not a one-time intervention. Instead, dental work took the form of a continuing process that, once initiated, demanded measures of maintenance and correction, further reductions, and even changes in contouring, which were enacted until the tooth would eventually fall out with age, wear, or functional damage. It is clear that the age of the person undergoing the initial dental procedures falls into or after puberty. No infants or juveniles (before age ten) manifest dental work in our regional record. A reduced proportion of teenagers, just like the one documented from Yaxuná, show the fresh striations of recent filing. In this age group, only about one out of four teeth show cultural modification (26.1%; Tiesler et al. 2016). For subsequent age groups, the percentage of modified dentitions already reflects the general proportion among adults. Nevertheless, dental work could be performed also at more advanced ages, even in mature adults, as the fresh striations in older individuals seem to indicate.

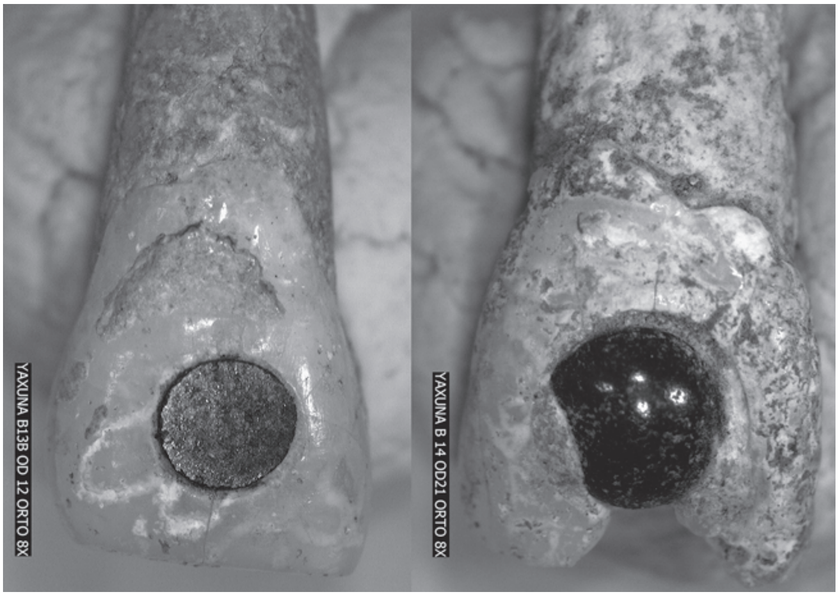


FIGURE 5.12. (a) Male adult with pyrite incrustation from Burial 13B; (b) close-up of spherical inlay shining out of the mouth of Burial 14 (microphotography by Marco Ramírez, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

The extent of health hazards and aesthetic risks caused by dental work have not been the subject of systematic scrutiny yet, although dentistry does not leave much room for doubt that the mechanical stresses exerted by artificial tooth grinding and drilling must have increased the rates of infectious decay and pulpal responses (Fastlicht 1948; Gwinnett and Gorelick 1979; Mata 1993; Ramírez 2016; Ramírez et al. 2003; Romero 1958; Tiesler 2000b; Tiesler et al. 2002, 2016). In other work, however, we have shown that the rate of secondary caries due to dental drilling is astoundingly low (Ramírez 2016; Tiesler et al. 2016). Pulpal calcification, a physiological consequence of tooth drilling, did prove to be directly related to dental interventions. No caries were detected beneath some 24 X-rayed inlays still in place.

PERMANENT PHYSICAL EMBODIMENT AND CULTURAL CHANGE

The permanent forms of physical embodiment we have discussed above were by no means simple or one-dimensional, as shown by local head-shaping practices and dental modifications. Both in their enactment and in their visible result, the two body practices held deeply embedded cultural meanings related to native body concepts. The crafting and display of head forms and artificially adapted dentitions subscribed to the construction of cultural and ethnic identities for their human bearers that most likely operated more on the scale of family traditions than on the community or city level. We infer the latter idea for Yaxuná, as we witness its inner diversity in physical embodiment (which mirrors that of other coeval settlements), while discerning similarities between dental contours and head forms on the residential level (which we think point to more unified residential traditions).

In the context of the regionally relevant political landscapes, the shifting economic ties and political networks of Yaxuná, with its alliances east and west, were not mirrored by noticeable shifts in its people's physical appearance. As discussed in chapter 1, some of these networks were mutually antagonistic, especially in the increasingly hostile political environment toward the close of the Classic period. In this dynamic, the conservative, cohesive quality of head practices and dental works in all probability allowed it to outlast other more divisive or fluctuating cultural dynamics, materialized in the choice of or access to exotic goods, trade networks, or ceramic wares. Thus, artificial head flattening and dental contouring may have been similar in this regard to other stable, long-lasting forms of cultural reproduction and preservation of group identity enacted in everyday life and materializing statements of "belonging."

We conclude this section in this vein by bringing home a number of thoughts regarding cultural continuity versus change on the Classic period peninsular shelf. There appears to be continuity toward the central and eastern southern lowland areas when it comes to dental handiwork and head-shaping practices. The data from Yaxuná indicate similar trends of continuity in inland Maya heritage and culture, set apart from coastal populations, at least in terms of artificial head shaping. It is on the coast that the culturally reproduced ways materialized in the body appear to shift, a process seemingly accelerated toward the close of the Classic era, anticipating the drastic ideological and cultural substitution to be showcased eventually at Chichén Itzá (Sierra Sosa et al. 2014 a, 2014b; Tiesler 2014).[4]

This finding may give more credence to the idea that while Yaxuná appears to have been a complex community where mobility was common, ideas of social identity and their visible expressions were rather enduring and continuous for the Classic period, especially for practices conferred by female practitioners, such as head crafting in babies. Concepts of beauty and identity expressed by the "social skin" were in many ways more tied to place than to shifting political and economic ties, underscoring the importance of identification with local places for the Maya and the likelihood that local populations were marked by substantial continuity over the centuries; population replacement does not seem to be an issue for this span of time.

PART II

YAXUNÁ'S DEAD

6

PASSING, MOURNING, AND PROCURING PERMANENCE

INTRODUCTION

In the Maya area, the associations between the mortuary record and the behaviors that once prompted them is not straightforward. Thus, caution is necessary when interpreting social realities and mentalities from mortuary contexts of the remote past, as there are many reasons why the dead may have been treated in particular ways. Besides a host of practical and circumstantial considerations, the burial assemblage may account for an individual's dying wishes, the wishes of the surviving "caretakers" of the deceased, and the acting out of collective ideology and particularly thanatology (Carr 1995; Chesson 2001; Dillehay 1995). Thus, the concern often voiced by scholars conducting mortuary archaeology in all past societies, especially those without eloquent graphic or written information from the distant past, is understandably justified.

The above critique is particularly relevant in the study of the ancient lowland Maya kingdoms, where the data-rich research environment and the continued presence of native life buffers the distance between the observer and the observed. Here, however, the challenge is not the lack of information (to bolster feasible interpretations) but the excess of data and the complexity of mortuary programs. Among the lowland Maya only critical and creative combinations of academic approaches promise to take interpretations beyond simplistic behavioral reconstructions or beyond ethnocentric discussions of autochthonous meanings. Bringing this thought one step further, we pose that any fruitful interdisciplinary scrutiny needs to be anchored within a culturally sensitive (emic) interpretational framework in order to gain any meaningful understanding.

At present, conventional interpretations of archaeologically retrieved burials still rest heavily on the material evidence of offerings, grave composition, the orientation of the dead, and burial location (cf. Ruz Llhuillier 1991). Yet the above-delineated breadth of Maya mortuary conduct and the apparent lack of collectively imposed or followed norms has rendered the study of mortuary patterning more difficult here than in most other cultural settings. Besides the "background noise," implied by the categorically incomplete nature of the mortuary record (as representing the ancient funerary rite), and the notorious poor preservation of organic remains in the tropic environs of the Maya lowlands, it is this lack of predictability that has complicated most archaeological research on ancient Maya mortuary behavior beyond simple descriptive efforts. As a result, the great majority of burials across the lowlands appear as by-products of field endeavors directed toward other research questions, salvage work aside. In fact, very little work is actually aimed at recovering optimal samples of mortuary remains for analysis—that is, complete excavations of platforms or patio units where the full range of household burials would be included. Thus, it is unsurprising that the vast corpus of available burial information, although represented by an impressive number of recorded contexts, has not yet successfully profiled Maya mortuary behavior across regions or even at specific sites. The aggregate funerary taxonomies, at least, have worked surprisingly well in inferring Maya political complexity, social hierarchy, and gender expressions (Krejci and Culbert 1995; Welsh 1988; Wright 2006). Yet here we are interested in reconstructing and understanding mortuary behavior per se; and we are still at a rudimentary level of understanding given the nature of the current data.

ARCHAEOTHANATOLOGY AND THE MORTUARY RECORD OF YUCATÁN

One limitation to the study of human remains in this area of the world has to do with the mortuary taxonomies commonly employed among Mayanists. These rely heavily on static dichotomous classifications of associated artifacts and grave architecture, while neglecting the arrangement of the human remains contained within, thereby greatly limiting the potential of untangling the varied and often protracted posthumous treatments (which the literature commonly reduces to singles and multiples, primary and secondary deposits). We feel that detailed taphonomic recordings of body and bone processing (see Tiesler 2006; Weiss 2011, etc.) still await systemic attention in future regional funerary research.

Recently, broader transdisciplinary endeavors have come to supplement these material reconstructions in mortuary research. As mentioned in the introduction, such an approach is the French-borne *anthropologie de terrain*, now known as archaeothanatology (Duday 1997, 2009). This approach is anchored in the changes of a human corpse within its specific burial environment. In the context of these changes, archaeothanatology examines the precise interaction of biological and cultural components of death, decomposition, and cultural intervention. This line of work emphasizes the active field participation of physical anthropologists or bioarchaeologists who have been trained in archaeological excavation methods. It is in the field that the elaboration and comprehension of detailed visual records of human skeletal assemblages takes place.[1] Beyond methodology, archaeothanatology really denotes an academic mindset of how to conduct funerary research and how to think about the archaeology of death and the *au-delà* (the hereafter).

Archaeothanatology also makes an overwhelmingly important contribution to mortuary archaeology in the Maya area, as recent work along this line of research has demonstrated (Novotny 2015; Pereira 2013; Pereira and Michelet 2004; Tiesler 2004; Tiesler and Cucina 2010a; Tiesler et al. 2010b). Given the benefits of this approach, we have chosen to use it to analyze the mortuary reconstruction of Yaxuná, most of which has been previously published by the authors of this volume and other project personnel (Marengo Camacho 2013; Stanton 2011; Stanton et al. 2010; Stanton and Marengo Camacho 2014; Suhler 1996). For our present purposes, we have reinterpreted each of the burials recovered by the Selz Foundation project in the 1990s using the extensive photographic record that was taken on-site and adding further information derived from technical drawings and the skeletal material itself. Those human assemblages that were recovered as part of the 2011 field season (Burials 27 and 28) were recorded and excavated directly by members of the Bioarchaeology and Histology Laboratory of the UADY. The combined taphonomic study is described in detail elsewhere (Tiesler et al. 2012, 2015) and will be taken up and contextualized regionally in the following paragraphs, using a regional database of some ten thousand published or reported burial contexts from different parts of the Maya area, of which some three thousand entries describe peninsular assemblages. These burial descriptions have been entered systematically and adapted to the burial classification put forth by Ruz Llhuillier (1991) and Romano (1974).

THE PRESENT STUDY

The overall count includes 47 mostly articulated and complete skeletal individuals (table 6.1). Of the total, 13 individuals came from the two tomb chamber contexts and will be described in chapter 7. The remaining individuals from the settlement population were interred in simple pits (N = 10) either covered by vessels or "unprotected," to use the term introduced by Ruz Llhuillier (1991). Note that, of these, two isolated skulls and one complete human deposit were recovered from the ritual rock-shelter on the east side of the North Acropolis. However, the majority of individuals from Yaxuná's known burials (N = 22) had been placed into lined cist graves, most of which were then covered with slabs. This sort of accommodation appears to have become standard practice among locals during the Terminal Classic period. Two additional deposits (Burials 14 and 22) did not fit into the classification scheme.

The subsequent section will focus on the general burial trends according to the mortuary category (funerary versus nonfunerary) and chronological assignment, using the project classification, which bridges the Early Classic tomb burials described in chapter 7 with the Late and Terminal Classic deposits (table 6.2). These chronologies have been evolving from the initial assignments by the Selz project and are founded on ceramic sequences, which we have combined recently with direct radiocarbon dates from sampled skeletal material and other contexts.

The minimum number of individuals (MNI) was obtained from each burial. Most of the individuals included in this study were recovered in single deposits (N = 22). Only two graves were reused once for a successive placement. One more contained three bodies, which

TABLE 6.1. Chronological ranges assigned to the burials of Yaxuná, discussed in this chapter and updated from Stanton et al. (2010).

BURIAL #	PHASE	GRAVE ARCHITECTURE	POSITION	DECUBITUS	ORIENTATION	ARTICUL.	MNI
Burial 5	Yaxuná III (AD 500–700)	Simple Pit	?	?	N	Primary	2
Burial 12	Yaxuná III (AD 500–700)	Simple Pit	Extended	Dorsal	N	Primary	1
Burial 14	Yaxuná III (AD 500–700)	?	Flexed	Dorsal	S	?	2
Burial 20	Yaxuná III (AD 500–700)	Simple Pit	—	—	N	Primary	1
Burial 21	Yaxuná III (AD 500–700)	Simple Pit	—	—		Secondary	1
Burial 28	Yaxuná III (AD 500–700)	Circular Cist	Flexed	Seated	NE	Primary	3
Burial 1	Yaxuná IV (AD 700–900)	Cist	Extended	Dorsal	N	Primary	1
Burial 2/4	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	N/S	Primary	2 (Successive)
Burial 3	Yaxuná IV (AD 700–900)	Simple Pit	Extended	Dorsal	NE	Primary	1
Burial 6 (A/B)	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	W/E	Primary	2
Burial 7	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	E	Primary	1
Burial 8	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	E	Primary	1
Burial 9	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	NW	Primary	1
Burial 11	Yaxuná IV (AD 700–900)	Simple Pit	Extended	Dorsal	E	Primary	1
Burial 13 (A/B/C)	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	E/W	Primary	3
Burial 15 (A-E)	Yaxuná IV (AD 700–900)	Crypt	Extended	Dorsal	E/W	Primary	4
Burial 16	Yaxuná IV (AD 700–900)	Cist	Extended	Dorsal	E/W	Primary	2
Burial 17 (A/B)	Yaxuná IV (AD 700–900)	Cist	Extended	Dorsal	N	Primary	2
Burial 18 (A/B)	Yaxuná IV (AD 700–900)	Cist	Flexed	Dorsal	N/S	Primary	2
Burial 25	Yaxuná IV (AD 700–900)	Cist	Extended	Dorsal	SE	Primary	1

TABLE 6.2. Chronological ranges assigned to the burials of Yaxuná, updated from Stanton et al. (2010).

PHASE	YEAR RANGE	CHRONOLOGICAL PERIOD ASSIGNMENT
Yaxuná Ia	(900–300 BC)	Middle Formative
Yaxuná Ib	(300–1 BC)	Late Formative
Yaxuná Ic	(AD 1–250)	Terminal Formative
Yaxuná II	(AD 250–500)	Early Classic
Yaxuná III	(AD 500–700)	Late Classic
Yaxuná IVa	(AD 700–850)	Early Terminal Classic
Yaxuná IVb	(AD 850–1000)	Late Terminal Classic
Yaxuná V	(AD 1200–1521)	Late Postclassic
Yaxuná VI	(AD 1521–1700)	Colonial to Modern

had been laid down in different events, and one other contained the remains of four individuals. In order to compare the taphonomic signatures among the assemblages, we employed a burial inventory jointly with the photographic record, sketches, and the original field notes and publications on the explorations funded by the Selz Foundation. From here, we elaborated on a likely mortuary sequence for each human deposit. This included the original placing, the interment sequence, and further cultural disturbances. Feedback on peri- and postmortem body processing was derived from the principles of human decomposition and disarticulation, along with specific signatures of anthropogenic handling, including fire exposure in different states of decomposition (see table 8.1). These have been described by White (1992), Turner and Turner (1999), and Pijoan Aguadé and Mansilla (1997), among others; some of them adapted to the regional taphonomic conditions and specifically those of the Maya lowlands (Cucina and Tiesler 2008; Tiesler 2007).

MOURNING THE DEAD OF YAXUNÁ DURING THE LATE CLASSIC

Six mortuary contexts from Yaxuná date to the Late Classic—namely, Burials 5, 12, 14, 20, 21, and 28 (table 6.1). The latter, Burial 28, was retrieved in 2011, while the others had been explored and described two decades earlier by the Selz Foundation project (Stanton et al. 2010).

BURIAL 5

This deposit was located in the fill of Str. 5E-59-2nd, a substructure of the primary structure of the lower plaza of the Early Classic (Yaxuná II) palace complex. This complex was also

FIGURE 6.1. Badly eroded remains of Burial 5 (Yaxuná, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

occupied during Yaxuná III and IVa times. The only extensive excavations in the group have been conducted at Str. 5E-50. The post–Early Classic occupation of this structure was heavily disturbed, and we do not have a good idea concerning what this group looked like and what it may have been used for during the Late and Terminal Classic periods. The ceramics in the fill surrounding Burial 5 were reported as Late/Terminal Classic by the Selz Foundation (Stanton et al. 2010), and a single radiocarbon date from the bone has a range of AD 656–769 (all AMS ranges are presented in two standard deviations), placing it at the transition between Yaxuná III and Yaxuná IVa. Given the associated ceramics, we favor a Late Classic assignation. In any event, Burial 5 was found on the south side of Str. 5E-59 in a liminal area, indicating that it might have some special significance beyond the typical household burial. In fact this structure may have been ritually terminated during Yaxuná IVa, indicating its symbolically charged importance (see Stanton et al. 2010:106).

The individual was a locally born child, who passed away between three and four years of age (figure 6.1). The remains were poorly preserved, but the individual appears to have been placed supine, extended with the head to the north. There was neither a formal crypt nor cist composed of stones, a pattern thought to be indicative of the Late Classic mortuary practices by the end of the Selz Foundation project (Stanton et al. 2010). One single grave good—a heavily eroded Late Classic polychrome bowl—had been placed over the infant's head. While no slip remained on the bowl, the fabric of the vessel as well as the shape of the bowl indicate that it had been a polychrome vessel (see Johnstone 2001). Likewise, a single documented upper premolar of an adult could be counted among the artifacts offered during interment.

FIGURE 6.2. Distribution of Burial 14 within Str. 4E-22 (Yaxuná, Selz Foundation).

BURIAL 12

This burial was located in proximity of Burial 14, which we think was placed at roughly the same time (figure 6.2). Both contexts were recovered from below the living surface of Str. 4E-22, the southern of two superstructures on the eastern side of a basal platform. This structure is in the western portion of the site. The sole individual in Burial 12 was placed in a simple pit in the platform fill with no stones to delimit the burial space. In life, the occupant was most likely a female. Placed in an extended supine position with the head to the south, isotope analysis indicates that the woman was local. An Arena Red: var. Arena dish was found inverted over her pelvis, a bit of a departure from the norm of dishes placed inverted over the skull.[2]

BURIAL 14

This burial is another unlined, simple interment that was found immediately southeast of Burial 12 (figure 6.2). It contained a local middle-aged male who had been placed on his back just like Burial 12. In this case, however, his body had been bundled tightly prior to interment. In this arrangement, the head of this corpse was placed toward the south. It was covered with an Arena Red: var. Arena dish, before the pit was backfilled.[3] Two molars of a large feline, a serpentine bead, and a bone blood-letter were found in the matrix and most probably formed part of the personal kit of the defunct individual whose dentition had been extravagantly incrusted with large flat and spherical pieces of pyrite. These visible signs of social rank contrast with the attributes of a rather harsh style of living, resulting in premature arthritis and the arching of the diaphyseal segments of his lower extremities. In the immediate vicinity of the body, a duplicate patella of a much more gracile individual was recovered, probably an adolescent. While we hesitate to assign a second individual to this burial to reclassify it as a multiple burial based on one duplicated bone, the patella may very well indicate that a second individual had once been present, either recovered incompletely prior to Burial 14 (a reduction so to speak) or added to the remains during the act of his interment.

BURIAL 20

Forming the east side of the central plaza of Yaxuná's North Acropolis, the structure that contained this context was much more central than the others previously discussed for this period. Burial 20 was found beneath the floor of the southern room of Str. 6F-4, which faces the main plaza space. While the excavations of this building did not reach contexts that dated prior to the Early Classic, explorations elsewhere on the North Acropolis demonstrate that it was originally constructed as a triadic group during the Late Formative (Stanton and Magnoni 2013). This would indicate that Str. 6F-3 was already one of the flanking buildings of the acropolis by the time Burial 20 was placed.[4] This burial intruded into the floor of the room. An oval cut was made into the plaster, and the individual was laid out extended on its back into the construction fill. As with other burials dated to the Late Classic, capstones were either not used or retrieved later after the corpse had decomposed. The funerary space was probably unfilled at first considering the formation of patina on the bony surfaces and the rodent damage. Eventually, however, the grave was filled with *sascab* (white soil), which also served as a patch of the floor above. The only grave goods to accompany the postmenopausal female occupant of Burial 20 were a series of deer segments that flanked her left side.

BURIAL 21

This burial was found in one of the satellite acropolis groups of Yaxuná—concretely, in Str. 4 at Xkanhá, a peripheral acropolis located approximately two kilometers to the northwest of the Yaxuná site center. The Xkanhá acropolis was first constructed in the Early Classic, and a Terminal Classic reoccupation has been reported (Ardren 1997). Burial 21 was located approximately 40 cm below the ground surface in the construction fill of the building. Three ceramic vessels were located in what was interpreted as a cache in the fill; Ardren (1997:122–123) argues that the human remains represent a human head placed with the vessels as a dedicatory offering. The vessels included a much eroded Aguila Orange: var. Aguila plate, a Teabo Red: var. Teabo bowl, and a Tinaja Red: var. Tinaja bowl (Ardren 1997; Johnstone 2001). A small *Spondylus americanus* bead and a carved shell earflare were also recovered from the context. While the articulation of the bone material is not altogether clear, the remains and ceramics appear to come from a restricted area. The human remains are from a foreign-born adult. Stable isotope analyses indicate that this person did not grow up in Yaxuná and may have come from southern Quintana Roo or the Puuc Hills region.

While the remains are poorly preserved, several fragments of long bone were identified among the remains, indicating that this context was likely not a cache of a single head accompanied by ceramic vessels. Further, a radiocarbon date from the bone material yielded a date of AD 575–666, placing it squarely in the Late Classic Yaxuná III complex. Several observations can be made at this time. First, limited reanalysis of the Xkanhá ceramics suggests that a Late Classic occupation may be present. If this is the case, Burial 21 appears to date to this period and follows the Late Classic pattern of burial without a defined crypt or cist. Although the Teabo Red bowl should date to the Terminal Classic, both the Aguila Orange plate and Tinaja Red bowl are earlier. Yet these were the only reported whole vessels that we were not able to reanalyze for this study. Given the modal similarities between Teabo Red and Kinich Orange (the latter is a "Middle Classic" type [see Boucher and Palomo 1995]), all the vessels may actually date to the Early or Late Classic. Only a reanalysis of the vessels will resolve this issue, but we place the burial in Yaxuná III based on the radiocarbon date and the possibility that the vessel identified as Teabo Red is Late Classic. Second, given the inclusion of long bones in the burial, we suggest that this may have been a complete individual whose remains did not preserve well. In many cases across the Maya area artifact caches with no human remains may actually have served as burials, but due to poor preservation all that remains are the grave goods. In many cases the skeletal remains and teeth were either removed and/or decayed beyond recognition. We believe this to be the case with Burial 21.

BURIAL 28

This burial was found in the southern portion of the site core, in the plaza in front of Str. 6E-32, the eastern ancestor temple for the 6E-30 Group. This domestic group is the earliest yet identified at the site, with continued occupation from the Middle Formative through the Terminal Formative (Stanton 2000; Stanton and Ardren 2005). After a hiatus during the Early Classic the group was reoccupied during the Late Classic. This burial dates to this period. A sample of bone from the individual yielded a range of dates between AD 419 and 577, although the two vessels found in the burial context, a Tacopate Black-on-Buff: var. Unspecified bowl and a Kinich Orange: var. Kinich bowl are both Late Classic, indicating that the latter portion of the range, falling in early portion of the Late Classic, should be correct.

The main occupant (Burial 28A) is a man who had died in his fifth or sixth life decade. His bundled corpse was placed in a circular stone-lined cist (figure 6.3). Some 90 cm deep, this burial feature has an inner diameter of some 80 cm and was found capped with flat stones on top. The bundled remains of this individual had been placed into it in a seated position. The body and especially the forehead appear to have been covered with a red substance. After placement, this assemblage was covered with capstones and sealed from above without being filled in with dirt. To the contrary, it appears that efforts were made to protect the body from the dirt on top of the sealing. These efforts must have been successful, as the funerary space had not been infiltrated by sediments until after the corpse decomposed. Within the cavity this process led to the gradual disarticulation and collapse of all bone segments right on top

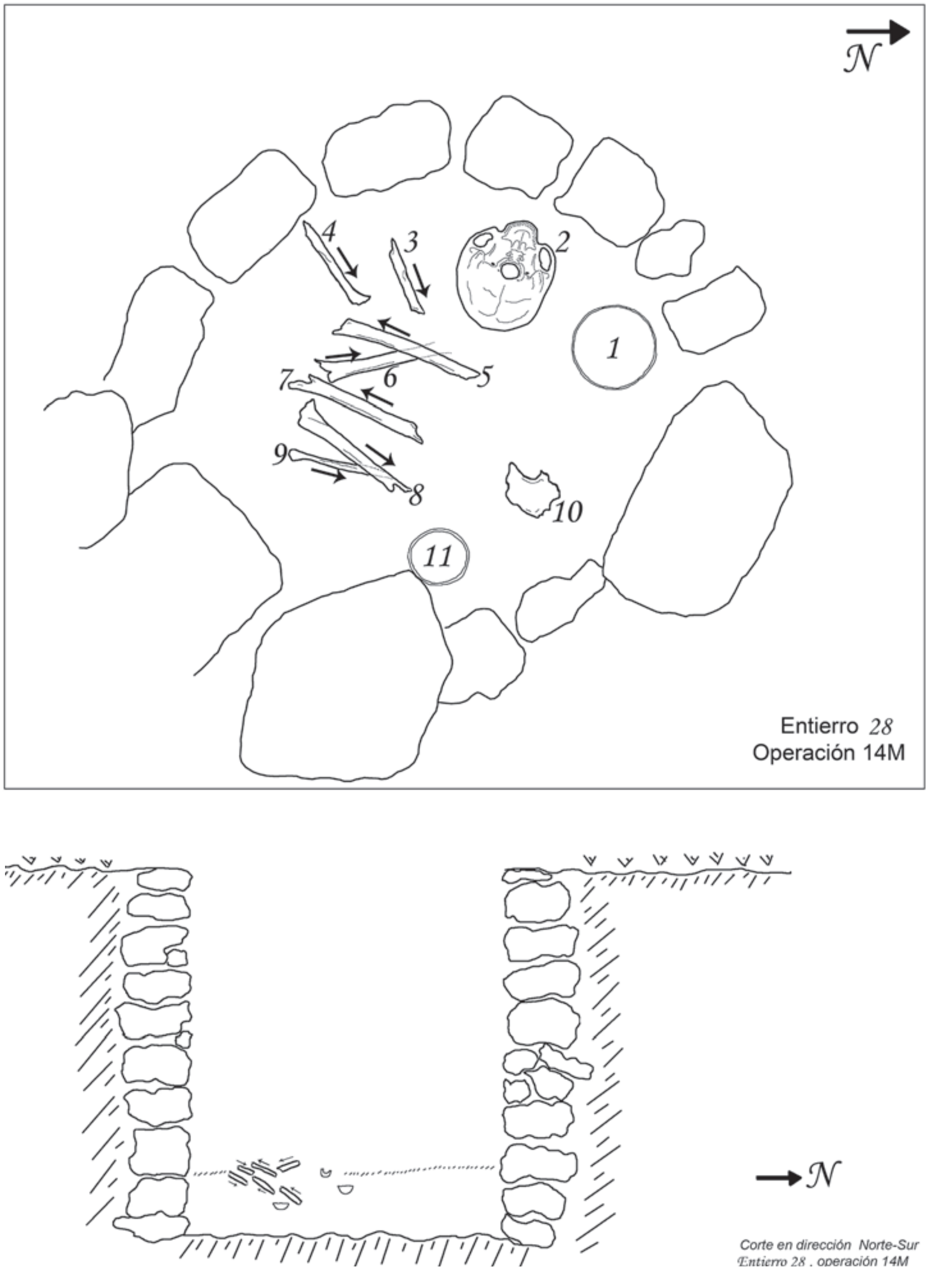


FIGURE 6.3. (a) In situ distribution of bone segments of Burial 28 within a lined round cist. Arrows = "toward distal end": (1) Vessel no. 1, (2) skull, (3) forearm segment, (4) right humerus, (5) right femur, (6) right tibia, (7) left femur, (8) left tibia, (9) left fibula, (10) left iliac bone, (11) vessel no. 2. (b) North-south transverse cut (PIPCY; drawing by M. Sánchez).

of the cist floor. As the cranium fell, it came to rest in an inverted position, while the equally inverted mandible had fallen down and landed at a distance to the cranium. All these elements make an unlikely scenario, would the cist have been filled in immediately to gradually replace the skeletal segments of the seated, decomposing corpse with soil. One other element is that a small greenstone bead was recovered near his fibula. In our scenario of a bundled, seated corpse, it is probable that this greenstone bead had been originally deposited in the mouth and that it eventually fell to the location in which it was found as the body decayed in the void space. If this is the case, the individual likely was "facing" the southeast.

Over the following years this funerary space was filled in culturally or gradually filled up as sediment percolated into the void. It is noteworthy that, although isolated and incomplete, the remains of at least two other individuals were contained in the fill of this funerary cist. Individual 28B (CP 15) is represented by the eroded bone scraps of vertebrae, skull, and femurs of at least one adult of unknown sex. No articulation was documented in the field, which suggests a secondary placement together with 28A, or alternatively before or after this deposition. These associated remnants appeared in a matrix that included highly eroded ceramics and chert flakes, which may be transposed Middle Formative materials from the matrix into which the burial pit intruded. The last individual, Burial 28C (CP 16), was represented only by fragments of maxillary bone of a child between the ages of two and three.

GENERAL COMMENTS

Although reduced in number and not representative of the large number of dead bodies to be expected after over 100 years of urban occupation, the six mortuary contexts discussed from Yaxuná show trends that typify common Maya funerary programs during the Classic period on the Yucatán Peninsula and beyond. No clear preference in terms of body orientation was noted, except for a preferred alignment on the north–south axis. Most of the above-described contexts stem from placements of fleshed corpses into lined or simple pits, previously dug into domestic platforms. Once the flexed, bundled, or extended bodies were lowered into the ground, the hollow spaces were either backfilled or were sealed on top, as in the case of Burial 28. At least three of the six assemblages contained supernumerary human remains, either in the form of single bones or incomplete skeletons. These additions either express incomplete removals of prior mortal occupants or a selection of bones of another deceased person. Regardless of their precise origins, the human additions within the mortuary spaces give a collective feeling to the otherwise singly interred bodies. They manifest that mourning and ancestral remembering was by no means directed to individual death, but rather to dead generations of residents and kin. Continued ancestral remembrance reinforced ties with dead kin and procured for the surviving kin continuity of cycling, of space and time (McAnany 1995).

Note that the Selz Foundation project reported that the graves from this period were still lacking stone-walled crypts with capstones (Stanton et al. 2010), which are quite frequent at other sites. Given that these interments date to the time of the construction and use of Sacbé 1, there was indeed some speculation in the field that they could be typical of Cobá's mortuary repertory. Unfortunately, burials from Cobá and northern Quintana Roo in general are not well reported for the Late Classic to sustain any particular connection to this area. Regardless, the graves from Yaxuná dated to this period present some interesting patterns. Lourdes Toscano Hernández (personal communication to Stanton 2013) reports another Late Classic circular cist near the ballcourt of Yaxuná that appears similar to Burial 28, described here. Unfortunately, little information concerning the former context is known. Other contemporaneous circular cists with seated occupants are reported from Chac II in the Puuc region (Smyth and Rogart 2004; see also Stanton 2005b),[5] Caucel (Rodríguez Perez 2010), Noh Bec (Rodríguez Pérez 2007), and Río Bec (Pereira 2013), further south, suggesting that these seated interments may be rare but are constant in the mortuary record of the region. Recently, Grégory Pereira (2013:454) has interpreted Classic period seated arrangements from the Río Bec area as "transitional" deposits, signaling the close of occupation or construction on top. These tightly flexed bundles, with their fully flexed legs tied in front of the trunk, either straight or crossed-legged, materialized the native concepts of verticality and change, centrality, axiality, and cycling, as opposed to more horizontal placements of mortals, who would be remembered and commemorated by kin, while residential life went on above. We cannot ascertain with the present evidence at hand if this dual concept applied also at Yaxuná at this time, but it is of interest that the seated cist burial (Burial 28) was sealed only on top, while the horizontal single graves appear to have been filled in after "protecting" some body parts with inverted recipients. Conversely, Burial 28 was not covered with any vessel, a point we will return to below.

MOURNING THE DEAD OF YAXUNÁ DURING THE TERMINAL CLASSIC

Some fourteen additional mortuary contexts date to the Early Terminal Classic (Yaxuná IVa; AD 700-900) at Yaxuná. They contain at least 24 individuals, excavated in different neighborhoods of the settlement, a sizable number of them being pairs or multiples. In the following section, we analyze and discuss the depositional sequences that led to each of the assemblages.

BURIAL 1

This burial was one of two Terminal Classic interments found in Str. 5E-103. This structure is located in the area of a dense Terminal Classic reoccupation of what was an Early Classic palace centuries before. Str. 5E-103 was heavily disturbed during its late resettlement. Classified as a crypt by the excavators, the individual was laid out supine and extended with the head toward the north. There is little taphonomic evidence, however, to determine whether the body was placed in a void (crypt) that filled up over time through a process of filtration of the overlying matrix or was filled intentionally by the people who buried the individual (cist); the absence of patina on the bones might suggest the latter possibility. In any event, the skeletal remains were those of a child of five to seven years of age; stable isotopes indicate that this was a local individual. Sex was undeterminable and it is unclear whether the child was deposited as a bundle. A single radiocarbon date from the bone of the individual resulted in a range of AD 336–543. The range is particularly early for the Slate Ware ceramics in the context, and we are cautious to use the radiocarbon sample to assign an early date (Yaxuná II or III). The ceramic wares associated to both burials relate Burials 1 and 8 chronologically to Yaxuná IVa. There are early Slate Wares in other parts of the peninsula (e.g., Boucher 1992; Vallo 2002, 2003), but all of the other early ceramic markers such as Chuburná Brown, Arena Red, Maxcanú Buff, Chancenote Striated, and Batres Red are missing from these contexts.

Several large fragments of broken Slate Ware dishes, including a large fragment of a Sacalum Black-on-Slate dish that covered the left portion of the pelvis and femur, were found covering the lower portion of the skeleton. A single fragment of deer bone was recovered on each side of the body near the legs. Further, a *Spondylus americanus* shell was found between the upper portions of the legs. Landa (1982) reports that shell was used to cover the genitals of prepubescent children in Yucatán at the time of contact. As will be clear from the following descriptions, children at Yaxuná appear to be buried with bivalves between their legs with frequency at the site, indicating that this regional custom extended back into the Classic period.

Finally, a peculiar conical vase was recovered over the broken dish fragment covering the left side of the pelvis and femur. The exterior of this vase is undecorated and poorly formed, while the interior presents a well-made Chumayel Red-on-Slate: var. Cafetoso Slate Ware surface (figure 6.4). The discrepancy in quality of manufacture of the two sides of the vessel makes it unique in the Yaxuná sample. Vases are commonly found in Terminal Classic burials across the Maya lowlands, although they are typically found in cylindrical or globular forms and with adults. There may be some correlation between the poor manufacture, the unusual conical form of this drinking vessel and the fact that it was found in a subadult interment. Costin (1999) reports poorly made *crisoles* in burials in coastal Peru as manufactured by the mourners; personalized grave goods materially representing individuals who participated in the burial event. It is possible that this vessel could materialize something similar or that it had been manufactured by a ceramic apprentice.

BURIALS 2 AND 4

Adjacent to Burial 1, this dual-interment was originally classified as two separate cist graves until further scrutiny identified them as a successive multiple instead. In our reanalysis of the contexts, Burial 2 corresponds to the upper of two individuals recovered in the northeastern corner of Str. 5E-105. This building was part of a densely settled area of Terminal Classic habitation surrounding the Early Classic palace. Although the Selz Foundation project classified other burials by mortuary contexts (regardless of how many individuals were present in the burial, each context was classified as a burial), each of the two individuals recovered in this single crypt was given a separate burial number (see Stanton et al. 2010). Its architecture was composed of a single course of roughly cut stones and covered by hardly worked capstones.

FIGURE 6.4. Chumayel Red-on-Slate: var. Cafetoso vase from Burial 1 (photo by Yaxuná project, Selz Foundation).

The depositional sequence appears to initiate with the interment of Burial 4, the lower individual of the two. For this purpose, an oval crypt grave of one and a half meters in length and only 32 cm wide was excavated and lined with stones. A deceased female teenager was placed on its floor extended on her back and with the head to the south. The burial was found poorly preserved since it was most probably disturbed during reentry of the funerary space years or decades afterward, when a second corpse (Burial 2) was placed. From the field data it is impossible to ascertain whether bones were extracted during this event; regardless, it is conspicuous that the left humerus and right upper arm bones of Burial 4 were entirely missing, while the thorax, the femurs, and the pelvic girdle retained their anatomic association (Freidel et al. 1992). The presence of patina on the bones, the abundance of rodent marks, and the loose arrangement suggested by the technical drawings of this assemblage indicate that Burial 4 had been originally deposited in a void space, which was subsequently filled in. Isotopic analysis suggests that this individual was local to Yaxuná. A dish of the type Sacalum Black-on-Slate was found inverted over her face, while a bivalve shell pendant was recovered in the area of her pelvis. As discussed in chapter 5, these shells were used quite frequently to cover the genitals of prepubescent children still at the time of contact in Yucatán. If the pendant was indeed part of the dress of this individual, it probably marked her as a young girl, still not eligible to marry. In contrast to the proximal perforation in the shell located in Burial 1, this shell has two perforations in this distal end, possibly suggesting a different form of fastening.

Years or decades after the adolescent occupant of Burial 4 had skeletonized in an originally unfilled burial space, the cist was eventually reopened, an occasion during which some of the anatomic segments, determined to be absent, could have been disturbed or extracted. The burial space was also redimensioned to the size of 140 cm by 37 cm in order to accommodate an adult female corpse between 40 and 45 years with heavy parturition marks. Her corpse came to lie directly on top of the skeletonized remains of the teenager. She was placed extended and supine with her head to the north, inverted from the position of the lower individual. The deteriorated state of preservation limited any secure determination of bundling when placed. As no dental remains were recovered (we have no isotopic data from this individual), we cannot determine whether she was local or not. A deer bone was recovered near her right leg. The Selz Foundation project members believed that there might be a correlation between deer bone and female burials at the site (see Stanton et al. 2010). However, our subsequent analysis of the Yaxuná remains does not indicate that this is really the case. In fact, deer bone is found in burials of both sexes across the peninsula and may be the remains of food consumption at the time of interment. Interestingly, deer bone appears to more often accompany multiple burials across the Maya lowlands, such as this one or others, documented in detail at the coeval site of Xuenkal (Tiesler et al. 2010b). The placement of deer bone usually occurs when a subsequent individual is placed.

Apart from the vessel, the interior of an intact ceramic dish of the type Sacalum Black-on-Slate: var. Cafetoso covered the face of Burial 2, one other common Classic period practice in the Maya lowlands. A Xul Incised: var. Xul bowl was located in a niche near the right leg of the individual. Although the excavators believe this vessel to be associated with the upper individual, it is unclear whether it should instead be associated spatially with the left side of the head of Burial 4. Regardless, this vessel bears an incised *ik* symbol (plate 6.1). Burial artifacts with *ik* symbols are widespread geographically, but at the same time rare in general. In other contexts, these wares should have been used for cacao consumption. It is also of interest that teeth with *ik*-style mutilations, signifying aroma, taste, and/or breath, are seen more often among the upper echelon of Classic period Maya kingdoms than among members of the commoner class (Tiesler 2000b). Apart from the vessel, a shell pendant found near the left leg completed the funerary outfit. While no radiocarbon dates are available from this context, the two ceramic vessels from the cist and the material vestiges within the structure fill indicate a Yaxuná IVa date for both individuals (Shaw 1998).

Once the second body had been placed together with its corresponding grave goods, the cist was again lined and immediately filled in and covered with slabs. The position of the articulated femurs of Burial 2 (in a cross form) and the lack of patina leaves little doubt about the filled quality of the funerary space after the time of this second interment. Occupation continued at the structure until sometime around AD 850, before the residence was abandoned altogether.

BURIAL 3

Much less protracted than the Burial 2/4 is the funerary progression of Burial 3, which is represented by a poorly preserved series of long-bone fragments found in the fill of the platform centerline of Str. 5E-75. In this case, no defined burial space was noted by the excavators and no grave goods accompanied the deteriorated remains. Very little can be said about its human occupant except that the remains represent an adult. The field drawing of the bones suggests that the remains were placed into the fill in an extended position (no patina was noted) with the head to the northeast. A single radiocarbon sample provides a range of AD 695–887, suggesting a Yaxuná IVa date. The Selz Foundation project reports the final occupation of Str. 5E-75 to be Yaxuná III (Shaw 1998; Stanton et al. 2010), suggesting that this interment may be postabandonment.

BURIAL 6

The cover slabs of this burial rested only 40 cm below the upper platform floor before the structure was abandoned. Originally reported as a single individual, there appear to have been at least two bodies upon skeletal reanalysis. This conclusion ties in with the original assessment of reentry of the funerary space. Roughly delimited, this narrow cist was only 30 cm high, 170 cm long, and 35 cm wide and, considering the taphonomy of all skeletal vestiges, should have been filled right after placing the first of the two bodies into this assemblage. Located in Str. 6E-31, the principal domestic structure of the 6E-30 Group, this context dates to Yaxuná IVa (figure 6.5).[6] While not the highest residential platform, the 6E-30 Group is by far the most extensive. It is the only residential group yet tested at the site with pure Middle Formative deposits and has a causeway dating to this early period extending off its northern end indicating its importance (Stanton 2000, 2005a; Stanton and Ardren 2005). After an apparent hiatus in use during the Early Classic, it appears that the group was reoccupied toward the end of the Late Classic. Given the stratigraphic placement, Burial 6 may have been originally occupied shortly after this time at the beginning of the Terminal Classic.

The fact that several of the bones were in an anatomical position does suggest indeed there were originally two individuals. Further, there is a clear difference in robusticity in the remains, indicating that more than one individual is represented. While sex and age could not be determined with accuracy due to the state of the skeletal material, both individuals were adults. It appears that the individual that was placed first (Individual 6-2) was put to rest with the head apparently to the west (a pattern that fits for multiple burial contexts in the Maya lowlands), although the remains from both individuals were too deteriorated to distinguish securely between the two during excavation. The upper individual and therefore the one to be interred later in time (Individual 6-1) was placed extended, supine, and with the head to the east.

Given the lack of evidence for degenerative disease for Individual 6-1, it is likely that he or she was under 45 years of age. Although the stature of this individual was under the norm for males, several robusticity indicators suggest that this individual might not be female. Stable isotope analysis of one of the eight teeth found in the crypt indicates a foreign origin for one of the two individuals. We believe the tooth is from Individual 6-1, but given the state of preservation and the misidentification of the burial as a single interment, it is possible that the tooth belongs to the second individual. In any case, the isotope data indicate that the

FIGURE 6.5. (a) Burial 6 during excavation; (b) drawing (Yaxuná Project, Selz Foundation).

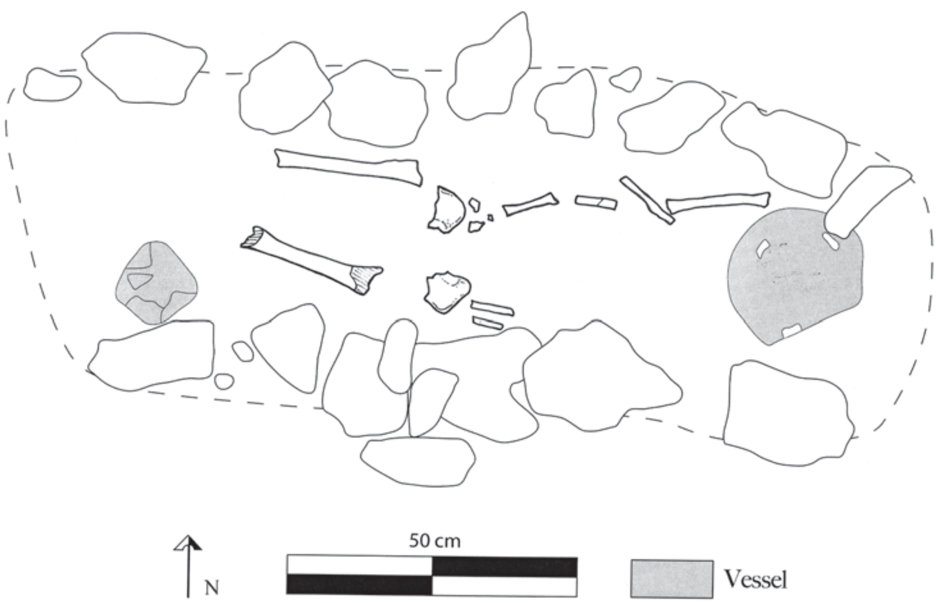


FIGURE 6.6. Tabi-Gouged and Incised vessel, placed together with Burial 6 (photo by Yaxuná project, Selz Foundation; skeleton redrawn by V. Tiesler).

owner of the tooth in question is likely from one of two areas, the Puuc Hills region or southern Quintana Roo. Given the ceramic grave goods and the likelihood that the burial dates to the end of the Late Classic or even the beginning of the Terminal Classic, a time that a Puuc influence was heavily felt at the site, the Puuc assignation is appealing. Could one of the two individuals have originated from the Puuc Hills and then came to Yaxuná around the time that this Puuc-style group was built?[7]

The same problems we face in differentiating the skeletal material we also confront in classifying the grave goods. While we believe that most or all of the grave goods pertain to Individual 1, it is quite possible that some of these objects were placed with Individual 2. One grave good that we can clearly assign to Individual 1 is a Sacalum Black-on-Slate: var. Cafetoso dish that was placed over the skull. A second ceramic vessel, a Tabi Gouged and Incised: var. Tabi globular vase is reported to have been found by the left leg of individual 6-1 (figure 6.6). It is possible, however, that this second vessel belonged to Individual 6-2, placing it near the head. In any case, the vessel is decorated with *pop* symbols, indicating that one or both individuals in Burial 6 are high status. *Pop* or "mat" symbols were used by the ruling elite in Classic Maya society. A drinking vase with such a symbol included in this interment is a significant issue, considering that the burial contains a foreigner quite possibly from the Puuc Hills region, which may have controlled or in some way administered affairs at Yaxuná during the first phase of the Terminal Classic period.

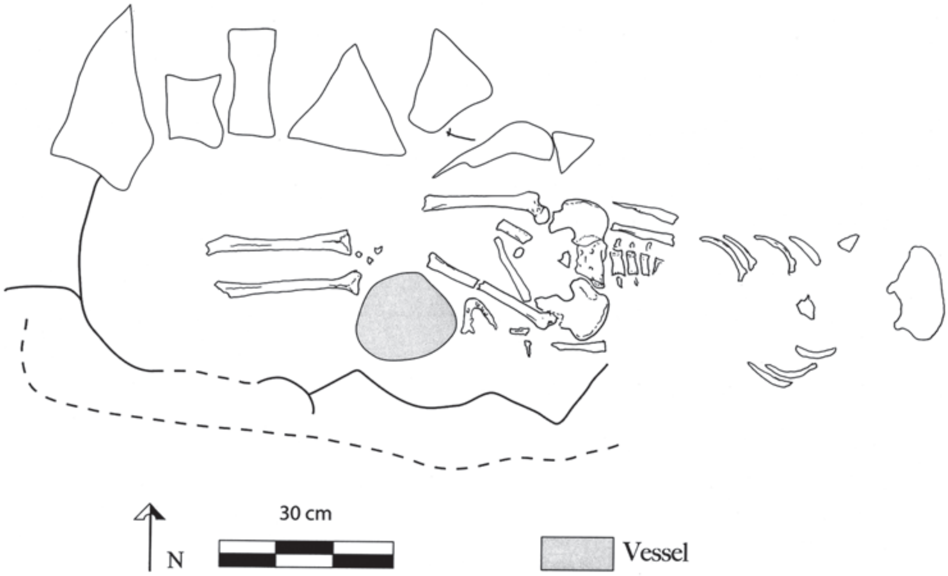


FIGURE 6.7. Drawing of the skeletal remains of Burial 7 (Yaxuná Project, Selz Foundation; skeleton redrawn by V. Tiesler).

BURIAL 7

This context contained a local middle-aged male that was located in Str. 6E-58, toward the southeast of the East Acropolis. The body was placed in the southeast corner of the building after having accommodated a stone-lined crypt or cist with capstones similarly dimensioned as Burial 6 (170 × 40 cm) (figure 6.7). We infer from the rodent marks and patina formation on the bony surfaces that the funerary space had been originally an empty void. The skeletal remains were found supine and extended with the head to the east. The Selz Foundation project reports that the hands were located beneath the pelvis, probably due to a slight flexing of the body to accommodate the ceramic vessel, a poorly made Muna Slate: var. Cafetoso jar recovered next to the left leg. This jar and the ceramics associated with the construction of the building were used to assign the burial to the Terminal Classic. Several faunal remains, identified by the Selz Foundation project, were found in the pelvic area.

BURIAL 8

Dated directly to the time surrounding the eighth and ninth century (C14: AD 681–883), this burial was found beneath the same floor as Burial 1 in the south room of Str. 5E-103 (figure 6.8). The single individual was identified as a middle-aged female, who had been placed extended and supine in a stone-lined cist with her head to the northeast. An Akil Impressed: var. Cafetoso dish covered the face of the individual as the only grave good recovered during the excavation.

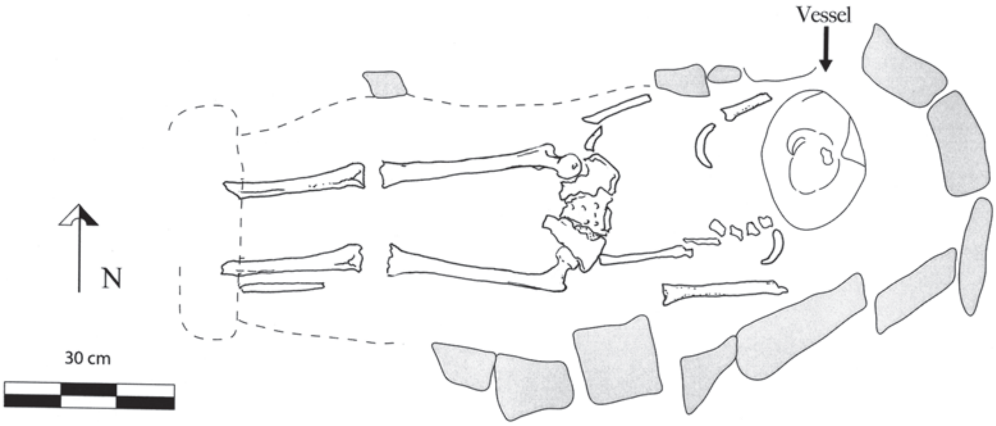


FIGURE 6.8. Drawing of Burial 8 (Yaxuná Project, Selz Foundation; skeleton redrawn by V. Tiesler).

BURIAL 9

This burial was located in a crypt in Str. 5E-77, the western structure of the Late Classic elite 5E-73 Group, where Burial 3 had also been found. In contrast to Burial 3, however, Burial 9 is a clearly defined mortuary crypt lined by stones and covered with capstones. The crypt contained the remains of a local child between the ages of three and five. The body had been placed supine and extended with the head to the northwest. The burial space was laid out on a northwest to southeast axis and was lined with natural stones, to be covered with three slabs that delimited an interior space of 92 cm × 30 cm.

Large Terminal Classic Slate Ware fragments from three separate vessels were located on top of the capstones. The patterning of the ceramics is suggestive of termination activity (e.g., Ambrosino et al. 2003; Stanton et al. 2008) rather than of typical mortuary burial patterns. No ceramics were found within the burial space itself. The only grave goods found in association with the skeletal remains were two shells and several faunal remains. The two shells were perforated *Spondylus americanus*; one appears to have been placed in front of the pelvis while the other behind it, perhaps as part of some sort of belt. Again, the use of a shell to cover the genitals of children probably explains the placement of the shell in this burial. Two fragments of deer long-bone were recovered near the left arm, and a fragment of a cranium was found on top of the pelvis.

BURIAL 11

This context was found in the northern portion of Str. 5E-167, close to the dense area of Terminal Classic habitation near the Early Classic palace (figure 6.9). The individual recovered from this context was a local adult female, although we were not able to assign a specific age range given the lack of adequate osteological remains. This individual had been placed in an oval, stone-lined cist covered by capstones. The skeletal remains were found in an extended

FIGURE 6.9. (a) Excavation photo; (b) drawing of Burial 11 (Yaxuná Project, Selz Foundation; skeleton redrawn by V. Tiesler).

position, supine with her head to the east. The right tibia was found crossing over the left one, perhaps to make space for the ceramic vessel or, alternatively, as a result of rodent activity in a void funerary space.

A Dzibilcal Black-on-Orange: var. Dzibilcal bowl was founded inverted over the face of the individual. On top of this bowl a Sacalum Black-on-Slate: var. Cafetoso jar was recovered.

A third vessel, a Yokat Striated: var. Yokat jar, was located next to the left tibia. While we have designated the burial to Yaxuná IVa, the ceramic grave goods are transitional between the Late and Terminal Classic periods. In fact, a single radiocarbon date (AD 656–769) from the bone of the individual corroborates this transitional date. Finally, a small perforated shell disk (possibly a button forming part of the funerary garb), a blue-painted limestone bead, and an obsidian blade were recovered from this mortuary context.

Obsidian objects are quite rare in mortuary contexts at Yaxuná and at inland sites in the northern lowlands in general. For example, obsidian is reported in only 1.6% (3 of 185) of burials at Dzibilchaltún. This contrasts with coastal sites in the northern lowlands such as Jaina (3.2%, 9 of 283) and Xcambó (4.3%, 25 of 587) that probably had greater access to this scarce resource given their location on coastal trade routes. Sites in the southern lowlands closer to obsidian sources located in the Maya highlands such as Tikal (13.8%, 31 or 225) and Copán (5.6%, 49 of 881) also have higher frequencies of obsidian objects in burials. Such low frequencies are understandable given the distance of Yaxuná and other inland northern Maya sites to these sources. Although we argue that Yaxuná was located on an inland trade route from the Formative, by the Late Classic coastal trade was beginning to eclipse inland trade, and by the Terminal Classic, when most of our burial sample dates, Yaxuná was likely to have had a small part in inland exchange systems, if it played much of a role at all.

BURIAL 13

This burial was a complex interment found in the south room of the western Str. 4E-20 of the patio group where the Late Classic Burials 12 and 14 were also recovered. This group looks back on a long occupation (Yaxuná II to IV), the latter of which makes the time frame for this burial. Three individuals, labeled Burials 13A, 13B, and 13C by the Selz Foundation project (Stanton et al. 2010), were recovered from a stone-lined crypt with capstones (figure 6.10). Burial 13 is a typical Terminal Classic multiple burial at Yaxuná and with its interior length of 190 cm and a breadth of 50 cm is a bit larger-dimensioned than the ones described above.

The first individual to be deposited was Burial 13C, a middle-aged or mature female. Her body was placed supine and extended in the crypt with her head to the east. Evidence indicates that the body was placed in void space, which did not fill in until much later, maybe after receiving the last interment (probably Burial 13B, as we argue). The remains were in poor condition, and no grave goods could be associated with this individual, except for a deer-bone fragment.

Burial 13A corresponds to the remains of a local middle-aged or older male, which were placed supine directly on top of the already skeletonized corpse of Burial 13C. Oriented inversely to Burial 13C, his head came to rest to the west. The level of constriction of the shoulders may indicate that the body was wrapped. Several grave goods were assigned to Burial 13A by the excavators. First, a poison bottle of the type Chumayel Red-on-Slate: Cafetoso was recovered in the area of the abdomen (plate 6.2). Several poison bottles were

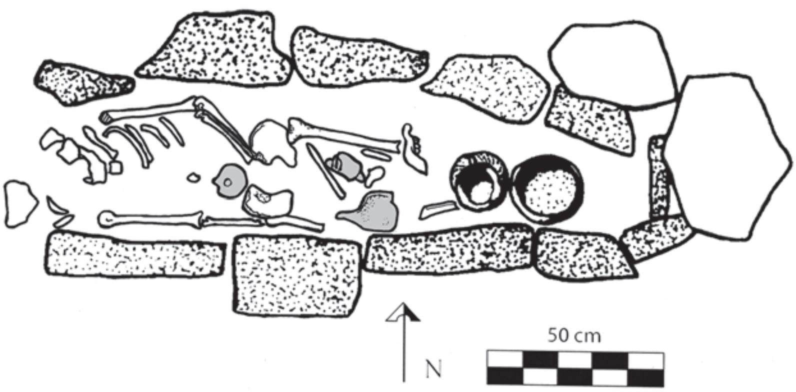


FIGURE 6.10. (a) Drawing of top slabs; (b) distribution of human remains of Burial 13; (c) bottom of the crypt; (d) excavation photo of upper layer of the crypt (drawings and photos by Yaxuná Project, Selz Foundation; skeleton redrawn by V. Tiesler).

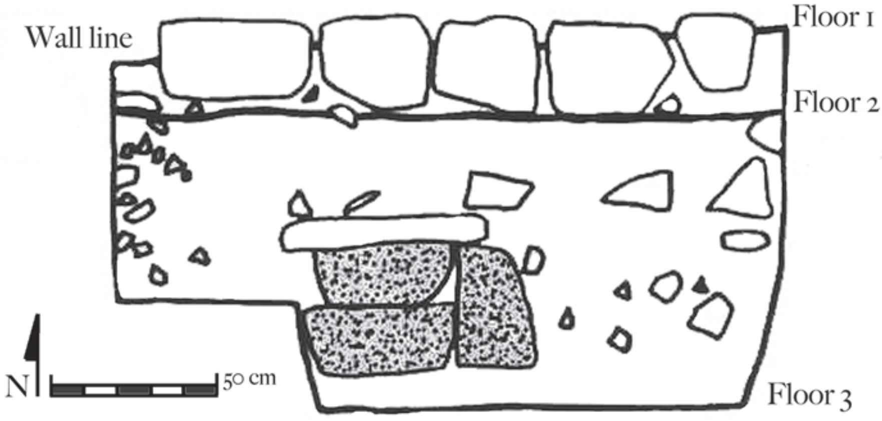
recovered by the Selz Foundation project at Yaxuná, although this was the only one found in a burial context. Poison bottles are found throughout the Maya lowlands but appear to be more common along the coast at sites like Xcambó. Evidence indicates that these vessels may have been containers for tobacco (Zagorevski and Loughmiller-Newman 2011). Second, two vessels were placed between the legs of Burial 13A; a Yokat Striated: var. Yokat jar and a Muna Slate: var. Cafetoso bowl. Third, there was a worked segment of a conch shell with some simple incised designs on the right femur; this artifact could have functioned as a receptacle for liquids. Fourth, a worked human femur with a perforation was interpreted by the excavators as a pectoral. This artifact was found over the thorax. Fifth, a *Spondylus americanus* pectoral and a five-pointed star shell were recovered near the mandible. Finally, Burial 13B was placed on the right femur of Burial 13A.

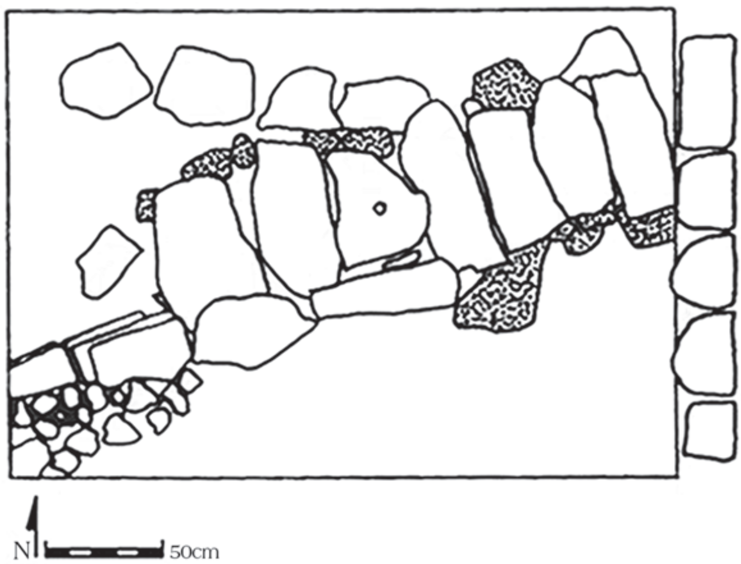
The skull of Burial 13B, probably the last human remains to be interred, belonged to a young foreign male. Stable isotope analysis indicates that he could have been from the Puuc region or from southern Quintana Roo. The individual was represented only by the cranium and the first four vertebras. This anatomic representation may indicate that the head had been severed at the height of the neck with the soft tissue still intact, although due to the deteriorated state of preservation we could not detect any indicative anthropogenic marks. While it is not entirely clear whether this head was placed in the crypt together with Burial 13A or sometime after, the lack of evidence for initial soil exposure of Burial 13A suggests that this individual decomposed and disarticulated in a void space and that the crypt was filled and turned into a cist only later, most likely at the time Burial 13B was deposited. If this is correct, Burial 13B was placed years or decades after the initial deposition of Burial 13A. Given the articulated state in which the vertebrae of Burial 13B were found and his foreign status, possibilities run high that this was a trophy head placed as an offering during a last reentry and the filling in of the funerary space. This interpretation is supported also by the skull's taphonomic surface properties, which indicate direct exposure to organic matter.

BURIAL 15

The context of Burial 15 is yet another successive multiple burial dating to the Terminal Classic (figure 6.11). It held the remnants of at least four individuals who were placed into this crypt over time. Some of these bodies are represented only by isolated fragments, probably relics or remnants of formerly complete corpses. While there are no radiocarbon dates, the Slate Ware ceramics in the crypt are fairly late Yaxuná IVa, and it is likely that Chichén Itzá was already an urban center at the time this burial was placed, although Sotuta ceramics were not yet in use at Yaxuná. The burial was situated in the northwest portion of the Str. 5F-49 platform off to the west of the site center. This platform had been occupied during the Early Classic only to be reoccupied centuries later, at the beginning of the Terminal Classic (Shaw 1998; Stanton 2000).

Prior to exposing the capstones of the cist, the excavators encountered an offering consisting of a Slate Ware vase containing two small ceramics beads and a miniature ceramic mask





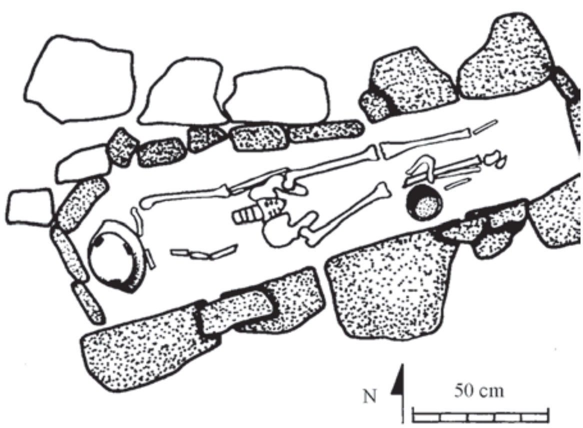


FIGURE 6.11. (a) Drawing of profile; (b) top slabs; (c) mortuary distribution of Burial 15; (d) excavation photo of bottom of the crypt (Yaxuná Project, Selz Foundation).

FIGURE 6.12. Xaya Gouged and Incised vessel found in Burial 15 (photo by Yaxuná project, Selz Foundation).

(all painted blue), together with a large unpainted stone bead. This cache was placed over the western part of the cists where the head of Burial 15A was located, probably placed here as a postburial offering. The vessel was a Xaya Gouged and Incised: var. Xaya vase depicting a scribe (figure 6.12). It is entirely possible that this vessel was originally part of the funerary context for Burial 15B and was reinterred when Burial 15A was laid to rest. Redeposition of earlier grave goods was common practice in sequential multiple burials such as these across the Maya lowlands during the Classic period. A second cache of fragmented deer bone and two shell pendants were recovered over the cists further to the east. Given the use of shell pendants to cover the genitals of children in the Maya area, the second cache may have belonged to Burial 15D and was replaced when Burial 15A was interred.

The crypt itself, measuring 190 cm long and 45 cm wide, was meant, or eventually adapted, to hold more than one individual. At least seven stone slabs covered this crypt, forming a rectangular cap. Both the anatomic distribution of the complete individuals and the surface properties appear to signal that this funerary space was filled in from the start. The first human occupant was termed Burial 15B, a local adult female who came to rest in an

FIGURE 6.13. Long bones of Burial 15B, showing probable blow in green-bone in the anterior portion of the left tibia (Yaxuná, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

extended supine position with her head to the east. Given the poor condition of the remains, the age of the individual could not be determined with great accuracy.

The second, or in any case the last, fully fleshed corpse to be placed into the crypt was Burial 15A, a local young- to middle-aged adult male, whose body was placed supine and extended with his head to the west. As with all documented successive multiples from the local domestic contexts, this individual was placed in an inverted position with respect to the first deposition (Burial 15B). An unhealed wound cut off the anterior portion of the left tibia of Burial 15A's left tibial diaphysis (figure 6.13). We asked ourselves whether this blow was the cause of death of this individual or whether it was inflicted sometime during reentry, given that the mandible was allocated on top of the lower extremities.

The excavators assigned all of the grave goods to Burial 15A. These artifacts included a Chumayel Red-on-Slate: var. Cafetoso tripod dish with slab supports that was inverted over the face. A second vessel, a Ticul Thin Slate: var. Not Designated vase, was found over the femurs. This vessel was covered with stucco and painted with a polychrome design (figure 6.14). Several faunal bones were found inside this vase. These were originally identified as human, but subsequent analysis identified them as large mammal segments (Götz in Stanton et al. 2010). Finally, a bone whistle and awl were encountered in the upper chest area. While the Burial 15 context may very well have been a crypt prior to the deposition of Burial 15A, in any case it was filled at the time of the interment of the final individual or very soon afterward.

Burial 15C, a single mandible from an adult, was found near the proximal end of the right tibia of Burial 15A and appears to be associated with this latter individual. This mandible was

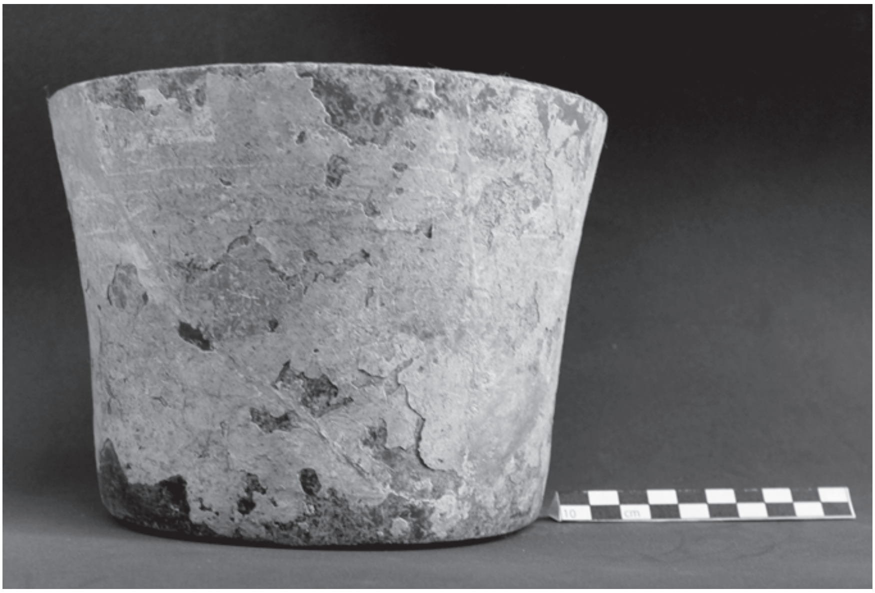


FIGURE 6.14. Stuccoed Slate Ware vase from Burial 15 (photo by Yaxuná Project, Selz Foundation).

so poorly preserved that any attempts at sexing it were rendered insecure. Mandibles were sometimes used as trophies in Mesoamerica but could be relics as well, treasured objects of ancestor worship. Off to the south of the tibias there were some other skeletal remains that could not be assigned to a particular individual. Burial 15D consisted of the sole fragment of a distal right humerus of a child. This child may have been placed before the last burial with the majority of the bones removed during the reoccupation.

BURIAL 16

This context was one of three Terminal Classic burials that were recovered at the 6F-42 platform, a domestic context located immediately to the east of the North Acropolis where important elite activity continued to take place during this period. Burials 16 and 17 were found in the western portion of Str. 6F-43, a rectangular foundation brace located along the northern edge of the basal platform. Neither of the burial contexts was well preserved, although it appears that Burial 16 was the latter of the two as it intruded into, and thereby disturbed, Burial 17. Neither of the burials contained ceramic offerings to date them. Further, the bone submitted for radiocarbon analysis did not contain enough collagen for dates. Regardless, the ceramics from the structure seemingly indicate that both burials are Terminal Classic.

The individual in Burial 16 was a nonlocal adult according to isotope data garnered from a bone sample. Namely, strontium isotope data identified this person as having a probable origin either in the Puuc region or in southern Quintana Roo. Since Yaxuná IVa was dominated by ties to the Puuc at the site, we would tend to favor the former assignation. Given the appearance of the supraorbital crests and the large mastoids, this individual was likely a male, although this assignment remains insecure due to poor preservation. The burial was heavily disturbed but appears to have been deposited in a supine extended position with the head to the east.

The excavators also reported that several cranial fragments were recovered in the area of the femurs. While the poor preservation of the context prohibits a clear understanding of the depositional sequence and the positive identification of two corpses, we suspect that these "other" cranial fragments represent a second individual that was placed in the inverse direction as the individual reported by the project. This interpretation would make sense considering the tradition of successive multiple burials during the Terminal Classic at Yaxuná. There was some taphonomic difference regarding the ossification of the material that would support this interpretation, but no repeated bones were identified. The only grave good that was found in the context was a small shell bead.

BURIAL 17

This burial was located in the extreme northwestern portion of Str. 6F-43. As mentioned previously, this loosely lined cist had been heavily disturbed by Burial 16. The Selz Foundation project identified only one occupant of the crypt/cist. Yet our analysis revealed that there were at least two individuals. The second individual, here designated Burial 17A, is only represented by a mandible, and we consider it as "associated" remains. Given the poor preservation of the context, it is difficult to assess whether Burial 17 is yet another Terminal Classic successive multiple. What remained of Burial 17A indicates that the individual was an adult (the age range could not be narrowed), most likely a male. The body was deposited supine in an extended position with the head toward the north. The long bones were not present in the context, and it is quite possible that the bones were removed from this individual at a later date. Given the patina on the bones and the rodent damage, it is probable that this context was originally a void space after deposition. The mandible of Burial 17B is robust and may belong to an adult male. No grave goods were recovered from this context.

BURIAL 18

This human assemblage was located in Str. 6F-73, the eastern structure of Platform 6F-42 (figure 6.15). Once again, two individuals were recovered from the context, found in the southeast corner of the northern room. The burial was a typical successive multiple Terminal Classic burial, its reduced dimensions (30 cm in breadth and 110 cm in length) adapted to hold the bodies of subadults. The first individual to be deposited, Burial 18B, was a child between the ages of two and four years, whose body was laid out supine and extended with the head to the north. From the taphonomy of this interment we infer that the funerary space was left void for some time, perhaps until it received the subsequent child body. Burial

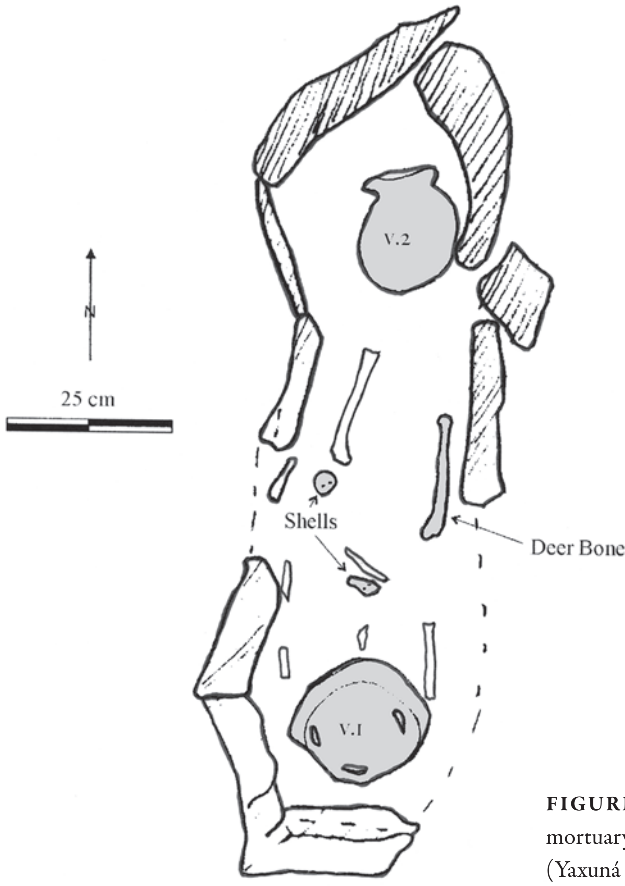


FIGURE 6.15. Drawing of mortuary distribution of Burial 18 (Yaxuná Project, Selz Foundation).

18A was the last of the two individuals placed in the crypt/cist before it was filled in and sealed on top. The remains of Burial 18A were of a child who had died between the ages of five and seven, and whose body was laid out supine with the head to the south.

Several grave goods were found in the context, although assigning them to a specific individual was tasking. We believe that the Dzán Composite: var. Cafetoso dish was originally placed over the head of Burial 18A given that it was found in the southern end of the context and dishes were often placed over the faces of the dead in the Maya lowlands. The Yokat Striated: var. Yokat jar was found in the northern portion of the context, although it is not clear when it was placed. Two bivalve shells had been placed in the area of the pelvises of both individuals. It is likely that these shells were placed over the genitals of each individual in response to the pattern found in the Maya area discussed previously. A long bone of a deer was found on the right side of Burial 18A and an unperforated shell was also recovered in the matrix. Bone from Burial 18A yielded a radiocarbon date of AD 639–773. Given the dish found associated with the head of this individual, we are inclined to assign this individual to the latter part of this range.

BURIAL 25

This context was found beneath the floor of the westernmost room of Str. 6F-68, a building identified as a council house that during the Terminal Classic was abutted to the south side of Str. 6F-4 on the North Acropolis (figure 6.16) (Ambrosino 2003, 2007). Str. 6F-68 has a complex basal façade with images associating it with authority. Given this context, we believe that it is highly significant that Burial 25 was placed here, possibly indicating that the individual was of great importance to the elite community living at Yaxuná during this period. The burial itself appears to have been dedicatory but was reentered at the time of the abandonment (Ambrosino 2007; Ardren 1999).

No datable ceramics were found in the stone-lined crypt, yet ceramics from the excavations indicate that the building was first constructed during Yaxuná IVa, and a series of radiocarbon dates suggest that the burial may have been placed during the eighth century AD. A radiocarbon sample from the bone of Burial 25 yielded a span of AD 671–872, a fairly large range. Three wood samples from a burning event associated with the abandonment of the structure, however, yield ranges of AD 655–777, AD 622–766, and AD 671–766.

Given the presence of Sotuta-style ceramics on the floor of this burned structure, these dates should not be representative of its abandonment. They could, however, represent older organic material culture associated with the construction or use of the building that was consumed by the flames when it was abandoned. All three ranges are fairly consistent, with the latter end dating to the beginning of Yaxuná IVa. Thus, we believe it is probable that the building was constructed sometime between AD 700 and AD 760 and that the original wooden vault beams were eventually burned.

The individual inside this crypt had been a young adult upon death. Given the gracile complexion, this person was most likely female, although the on-site stature measurement of 170 cm casts doubts on this assignment. Regardless of sex, the body was placed in the crypt in an extended supine position with the head to the east and left unfilled probably until being reentered at the time of abandonment, as mentioned above.

During reentry, the plaster floor was perforated just above the area of the pelvis and the capstone in this area was removed. It appears as if someone reached their hand in toward the eastern area of the crypt and took out several items, including the skull of the individual. While the cranial portion of the skeleton itself was missing, several teeth were recovered from the place where the skull should have been originally. Likewise, the entire upper torso was disarticulated by this activity, although the lower extremities remained intact, indicating that the removal of material occurred only in the eastern portion of the crypt. A ceramic base for a mirror was found in situ in the area of the pelvis, indicating a person of considerable rank. Several small greenstone beads and some deer bone were also recovered on the eastern side of the crypt, although it would appear that any larger grave goods that were likely located in the eastern area were also removed at this time.

The Selz Foundation project originally interpreted these data as the remains of a desecratory termination ritual undertaken by the conquering forces of Chichén Itzá (Ambrosino

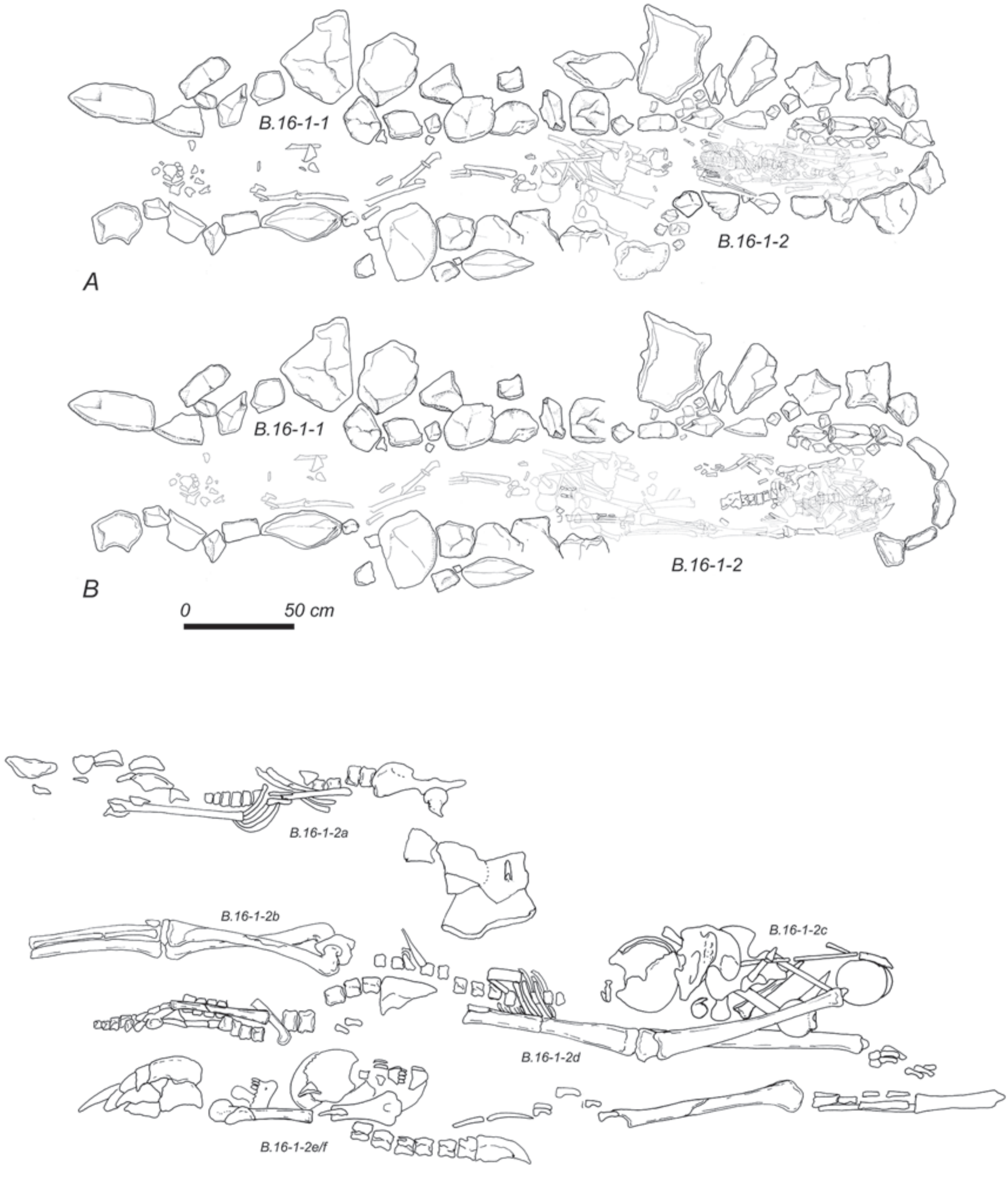


FIGURE 6.16. Drawing of skeletal distribution in the (a) upper and (b) lower portion of Burial 16-1-2; (c) profile of subsequently placed individuals coming to rest at different depths (Bioarchaeology and Histology Laboratory, UADY).

2007; Ambrosino et al. 2003; Ardren 1997). Terminal Classic defensive features were encountered in several areas of the North Acropolis (Ambrosino 2007), and the burning and intentional destruction of the council house in association with Sotuta ceramics indicated that Yaxuná may have fallen to the expanding power located just to the north. While Yaxuná may have very well fallen in a military battle to Chichén Itzá, the data from Burial 25, and from Str. 6F-68 in general, may reflect more than the destruction of the ideological material symbols by the Itzá.

Vallejo Cáliz (2011) has demonstrated that several households at Xuenkal, a Terminal Classic center to the northeast of Chichén Itzá, were gradually abandoned around the time that Sotuta ceramics began to appear outside of Chichén Itzá. We believe that Chichén Itzá, as a large urban development with a new ideological program, began to attract people from across the peninsula. Some elites may have been forced to move to the Itzá center, and we do not doubt that military means were employed in some cases. Yet regardless of the motivations, people moving to this area would have brought some of their important relics with them and may have intentionally terminated some of their own important structures upon abandonment. Thus, while the removal of bone material from Burial 25 and the burning of Str. 6F-68 may have been an act of violence directed against the community of Yaxuná, the data may also indicate an intentional closure of the building by the site's inhabitants and the extraction of important ancestral bones to be taken to their new home. We will return to this discussion in chapter 9.

GENERAL COMMENTS

The burials dated to the Yaxuná IVa represent more than double the number of excavated mortuary contexts dated to the prior phase. Although they denote continuity with Yaxuná III burials at the site, a shift away from seated bundle burials and toward extended multiples was noted. The Selz Foundation project characterized the interments from this period as being predominantly deposited in stone-lined crypts with slab capstones (Stanton et al. 2010). Paired deposits prevail, with two primary individuals placed inverted after the initial individual had skeletonized, sometimes accompanied by remnants of further individuals. Once the extended bodies were lowered into the ground, the burial context spaces were mostly left empty and were backfilled only once the last body was laid down. No preferred body orientation could be made out among these burials, indicating a lack of standardization. Once again, several assemblages contained isolated remains of additional individuals in the form of mandibles, humeri, or skulls. These additions either express incomplete removals of prior occupants or a selection of bones of another deceased person. Even more than the prior burial cohort, the mortuary assemblage of Yaxuná's Phase IVa does not denote isolated interment events, but complex and sequenced ancestral behaviors, which comprise most probably more than one single building platform. This period is marked by the appearance of Puuc-style architectural traits and a ceramic complex that is composed primarily by Slate Wares (Suhler et al. 1998b). Considering the possible origins of several of the individuals from this time period, we believe that this shift toward the Puuc sphere should have gone beyond the material culture to include to some (though not extended) degree population mobility between the east and the west in the Yucatán.

DISCUSSION

In this chapter we surveyed the shifting local and regional traditions of body preparation, grave deposition, and posthumous body manipulation in the form of reduction and relict taking. The depth and breadth of collective mortuary treatments at Yaxuná (and beyond) subscribe mostly to the family traditions from the settlement's domestic compounds. Here, the occupational sequence of the platforms marks time frames for the continually staged mortuary programs, materialized by what Pereira (2013) calls "occupational" burials—those graves accommodated below the floors of residential platforms without structural architectural modifications.

The fact that many of the burials were successive multiples does not come as a surprise, considering that during the Classic period it was common practice among surviving kin in Yucatán to use the same burial contexts for dead kin over long periods of time without substantial evidence for construction to go along with each burial event, as we have argued for "occupational burials." This means that the floor and dirt above was removed for subsequent deposit, which would lead to complete or partial disturbances of the previously buried bodies, to rearrangements or extractions of their already skeletonized remains. Sometimes, a previously unfilled, sealed initial interment was opened to place a new corpse. Thereafter it was sealed again or simply filled in with earth, as we infer from the differences between the decompositional processes. This form of continued burial occupation is indeed reminiscent of coeval funerary customs, which we previously documented at the Late Classic settlement of Xuenkal, some 60 km north of Yaxuná (Tiesler et al. 2010b). Here, most graves contained more than just one body. Most of the corpses held a supine head-to-toe arrangement, which recalls the funerary accoutrements at Yaxuná. Further, other Classic period peninsular centers, such as Caucel (Rodríguez Pérez 2007, 2010), show this sort of reoccupation, which seemingly responds to the generational cycling of young and old kin. Note that only the earlier burial contexts contained flexed individuals, one of them seated (Burial 28). We assume that the latter could have marked the onset of architectural abandonment or renovation, thus ending an occupational phase, as was argued in the corresponding section.

At Xuenkal, the lining-up of successive mortuary events could be prolonged and could have included extensive kin. In one of its central residential units, we documented one grave holding a total of 16 individuals, some of whom were still seen articulated and extended one on top of the other (figure 6.16; Tiesler et al. 2010b). Given the taphonomy and MNI of this massive mortuary deposit, we infer that it accrued gradually over the decades and most probably centuries of residential occupation. It contained men, women, and children, who had been placed extended supine below the central platform axis, giving tangible testimonies of ongoing residential life and generational cycling in the space above. Needless to say, this multiple assemblage from Xuenkal is very different from the deposit of 12 bodies into Tomb 24 (discussed in chapter 7), whose occupants were put into the chamber most likely in only one or two occasions, which informs about the contingency of the circumstances surrounding the formation of this context.

Yet what happened when the dead were transported from afar or were reassigned a different burial space within the settlement itself ? At least six individuals of our local series suggest this possibility and were determined as secondary placements versus 32 confirmed primary interments at the settlement. The former show no articulation and most of them consist of only isolated cranial or mandibular deposits. Although we cannot ascertain if the redepositions were close or spaced far apart, it is noteworthy that two of the four removed bodies with isotopic signatures came from outside the settlement. Likewise, most of the primary deposits show disturbances, either by faunal agents or anthropic activity during subsequent mortuary uses of the funerary space or unrelated construction work.

The architectonic association of some additional burials excavated not from beneath but around residential platform floors is telling. Such is Burial 9, described in the first part of this chapter. This deposit was found close to a step near the entrance of the structure. It is intrusive to Floor 1 and may even be part of some sort of termination activity when the building was abandoned. The Burial 9 context is somewhat similar to the Burial 5 context dating to the end of Yaxuná III. Both harbored small children in liminal areas of large elite platforms. While there are differences in the specifics of these two mortuary contexts and the sample is quite small, they potentially represent broader patterns of Late and Terminal Classic ritual activity, which we will address in chapter 8.

7

ETERNAL PERFORMANCE

The Royal Tombs

INTRODUCTION

ONE OF THE major conceptual problems that inspired the Selz Foundation Yaxuná Project was the search for evidence of divine kingship in the northern lowlands. Freidel (1979) had hypothesized that divine kingship had first crystalized as an institution in the geographic interior of the southern lowlands and throughout the region, including the so-called peripheries such as the northern lowlands. By the early 1980s Peter Mathews (1985) and other experts in Maya epigraphy had clearly determined the presence and distribution of divine kings throughout the southern lowlands. Meanwhile in the north, Jeff Karl Kowalski (1985) had identified a major divine king at Uxmal; David H. Kelley (1976) had provided the first deciphered name of a Maya king, K'ahk' U Pakal, at Chichén Itzá; stelae at Cobá clearly implied the presence of divine rulers (Guenter 2014; Stuart 2010; Thompson et al. 1932); and there was a scattering of stelae elsewhere that supported the existence of this institution in the northern lowlands. Yet the contrast between the monuments and physical remains of rulers in the south and in the north was, and still is, striking.

The extensive explorations by the Selz Foundation's Yaxuná Archaeological Project led to the discovery of two royal chamber tombs in 1993, labeled subsequently Burial 23 and Burial 24. For this study, we have revisited both contexts and their taphonomic signatures. From here, we will recount the death and deathways of several royals from Yaxuná who lived during the fourth and fifth centuries AD. As previously noted in this volume, their bodies were found in two radically distinctive contextual situations: while the mortuary program materialized in Burial 23 is clearly of a revered ancestor, all indications point to a violent end of the group of occupants recovered from the simultaneous multiple interment inside Burial 24. This tableau macabre resembles a terminal deposit (Mock 1998) but also points to royal resurrection following sacrifice and also to the dedication of a new phase of the pyramid and temple.

The range of treatments of remains and furniture exemplified in the Yaxuná tombs is commensurate with what we know from Early Classic tombs in the southern lowlands. Undisturbed or modestly disturbed royal tombs are an expression of the changing political scenery of the Maya governments. They can declare the establishment of dynasty, as in the case of the Huunal and Margarita tombs at Copán (Bell et al. 2004). They can display the need for dynasties to reassert their legitimate claims to rulership as in the case of Burial 48 and Stela 31 at Tikal (W. Coe 1990). And, in the case of dynastic replacement, they can ritually eradicate the placeholders of previous ruling families or usurpers as in the case of PNT 019 at Tikal (Laporte and Fialko 1995). In all cases the dramatic arrangements of people and things in royal mausoleums show that they were conceived not as containers of passive repose but rather as houses of the dead in performance. We note that this performative arrangement is a common feature of other Maya burials (Scherer et al. 2014). The ancient Maya lived with their ancestors (McAnany 1995), and the ancestors dwelt among the living. This chapter provides a contextual analysis of the treatment of Yaxuná's dead royal elite to discern their perpetual performances.

THE NORTH ACROPOLIS AS A REGAL PERFORMANCE SPACE

The Selz Foundation Yaxuná Project proposed, in its seventh season of summer field research, to carry out investigations in two of the three major pyramids of the North Acropolis, one of the major triadic groups in the city. This proposed work followed detailed mapping of the site center, test excavation of both civic-religious and residential architecture, and select horizontal exposure of residential and public architecture, including the Late to Terminal Classic period 5E-73 Group directly south of the Central Acropolis, the Formative Str. 5E-19 Group, the unexpectedly discovered early Late Formative dance platforms (structures 6E-53 and 6E-120) adjacent to the East Acropolis, and the 5E-50 Group, a likely Early Classic royal palace complex in the southern part of the site zone. The objective of extensive investigation of the North Acropolis was to better understand governance through monumental architecture during the Classic period (figure 7.1).

Test excavation on the summit of Str. 6F-3 showed that the final major construction effort on the summit pyramid dated to the Early Classic. Freidel had identified a regular slump trending east-west on the summit of Str. 6F-3 and suggested in his proposal to the INAH that this might be an Early Classic collapsed royal tomb worthy of investigation. As it turned out, this surface slump was over the terminated remains of a subsurface corridor that was part of an elaborate performance space built into this structure (Freidel and Suhler 1998; Stanton et al. 2010; Suhler 1996). Our investigations showed that the eastern structure in the triad, Str. 6F-4, particularly 6F-4-3 associated with Burial 24, was also designed as an elaborate performance space with summit terraces providing a high theatrical stage and the range structure below with five doorways and a broad stairway (Stanton et al. 2010; Suhler and Freidel 1998).

FIGURE 7.1. Excavations of structures 6F-4 and 6F-68 by the Selz Foundation during 1992 (photo, Selz Foundation). Burials 20, 24, and 25 were recovered from Structure 6F-4.

We have only very limited exposures of the earliest construction phases of the buildings, but these indicate initial construction during the Late Formative; excavations in the plaza confirm that the bulk of the basal platform was raised at this time and then subsequently abandoned for a period (Stanton and Collins, n.d.a). We presume that the Formative North Acropolis, even in decay or ruin, would have had the recognizable appearance of a place of public performance to the Early Classic people who chose to refurbish and develop it. Moreover, given the flat landscape of Yaxuná and the *sacbé* extending south from this the northern apex of the center, the very act of reoccupying the North Acropolis was a way of resetting the primary cosmic axis of the city as north-south rather than east-west as represented in the E-Group, the East Acropolis, and the triadic groups to the east of the center (Stanton and Freidel 2005). Following the evident collapse of Late to Terminal Formative Yaxuná as a royal city, perhaps in the same second-century era that witnessed the fall of El Mirador and many other cities, it would seem that the ruler who reestablished kingship there in the fourth century quite literally refurbished a masonry building on the 6F-3 locality, Str. 6F-3-6.

THE CYCLING OF A ROYAL MAUSOLEUM INSIDE STR. 6F-3

Given the lack of preserved inscriptions we do not know if the same ruler who during life had ordered the rearrangement and expansion of Yaxuná's North Acropolis would be laid to rest

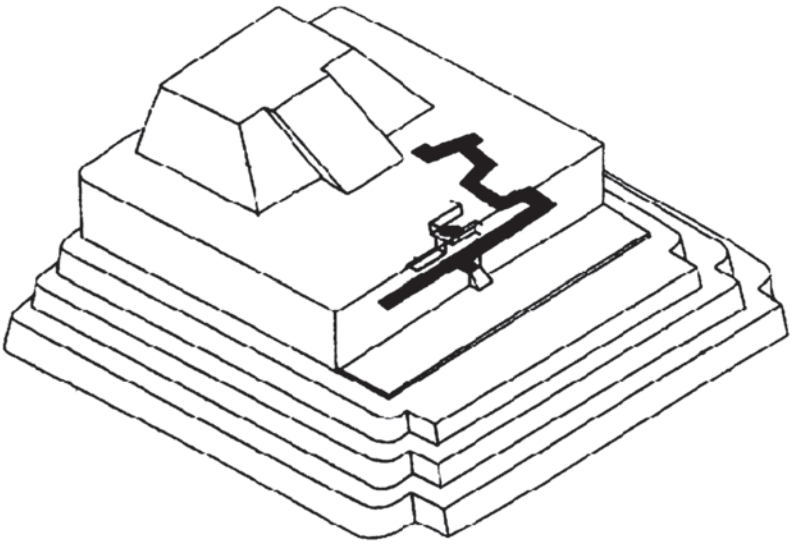


FIGURE 7.2. Plan of the Labyrinth in Str. 6F-3 framing Burial 23 following reentry and construction of the new pyramid (6F-3–4). The subsurface corridor echoes the U-shape of the mason's construction pen built around Burial 23 following reentry (Yaxuná Project, Selz Foundation)

in one of its central structures after death. An exquisite mausoleum was discovered by the Selz Foundation on September 3, 1993, and was excavated during the following weeks, revealing a richly attired mature male who had been placed on the marl-embedded floor of a stuccoed and vaulted chamber, located deep inside of Str. 6F-3 (sub-5), the northern temple of this acropolis triad (Stanton et al. 2010:164–174; Suhler 1996) (figure 7.2 and plate 7.1). When Charles Suhler discovered Burial 23, the eastward-facing entrance was still blocked only with the white marl that filled the antechamber. Rough blocks of stone were scattered on the floor. When David Freidel subsequently entered the chamber, he crawled carefully using only those stones and saw that the stones had not fallen from the roof or walls of the chamber. Moreover, it was clear that many funerary offerings appeared to be in place and undisturbed. Remains of an individual were exposed in the middle of the chamber between the rocks.

As the explorations show, the tomb of Burial 23 was constructed using existing north and south walls that belonged to a Formative era building. There are additional wall features in the antechamber of Burial 23 that appear to be part of the same room as the north and south wall features used to construct the tomb and the north wall of the antechamber, according to Charles Suhler (1996:100–102). Suhler observed through excavation that the walls in the antechamber were finished masonry and, in at least one instance, were backed by construction fill. That means that the feature was likely subsurface and not a superstructure. Although no direct radiocarbon dates could be obtained from the organic bone substrate of Burial 23, the architectural sequence, together with iconographic and ceramic associations, place the death of its adult occupant at around AD 400 (Yaxuná II Complex).

Given the width of the space between the northern and southern wall features attributed to Str. 6F-3-6, at 1.28 m, and the walls in the antechamber, we suspect that Burial 23 may have been built into a room or corridor segment of a preserved Terminal Formative subsurface labyrinth analogous in function to the earlier subsurface corridors and rooms of the early Late Formative dance platforms and the later Early Classic period subsurface corridors and rooms of Str. 6F-3-3. As a practical matter, if this interpretation holds, it seems likely that this king used such a labyrinth performance space for resurrection rituals before he was ultimately buried in it.[1]

The floor of the mausoleum had been filled in with fine whitish marl. In its center rested the body of this Early Classic king surrounded by his royal regalia (plate 7.1). The twisted disposition of the corpse is partly explained by the advanced, deforming arthritis, which this king had suffered prior to death. One or more flooding events of the chamber must have turned the marl into a sticky mud, causing the remains to sink. Most of the king's body and his provisions sank by different degrees into the wet ground, except for the head and the shoulders, which had come to rest on sturdy matting.

The regal corpse was covered by a single scorched censer fragment and surrounded by several angular stones, most of them visibly scorched with charcoal. The distribution of angular stones appears peculiar in this context granted their form and size (plate 7.2). It is also noteworthy that the chamber vault above was found intact, which precludes the possibility of them having fallen to their present position from above. Given the absence of visible signs of smoking or charring, the depth of ash volume recovered from above the original arrangement on top of the marl floor is just as telling as the absence of signs of skeletal disturbances or direct body singeing. All these observations lead us to infer that both the ashes and the angular stones were introduced during a reentry event long after the corpse had decomposed and after gravity had caused it to sink into the muddy bottom (plate 7.3). This reentry likely occurred through the only tomb doorway, facing east into the antechamber. Excavators discovered the antechamber filled in with white marl, effectively sealing the doorway.

As other colleagues and we have concluded (Stanton et al. 2010; Suhler 1996; Tiesler 2016; Tiesler and Scherer 2017), the charred rocks and the ashes on top of the mausoleum floor were introduced from outside the tomb and were probably extracted from hearths. This idea is consistent within copious examples of ash-associated tombs and graves throughout the Maya region, just as Grégory Pereira (2013) described for a series of burials from Río Bec in the northern Petén area. He interpreted the documented massive ash fillings as part of the mortuary programs that in all likelihood went along with the continued occupation of the platform above. With the ash deposits the deceased completed his or her posthumous cycling while family life went on above.

If this scenario holds true (plate 7.3), the builders of Str. 6F-3-4, who cut through the upper plaza floor of Str. 6F-3-5 and dug out the antechamber to access the tomb, laid the rough stones carefully in the chamber as part of reentry rituals. Stratigraphically it is feasible that a ritual fire (plate 7.3) preceded the creation of the burnt rock and ash pile surrounding the dead king. Yet it is impossible to know with any certainty whether such a ritual fire was part of the original interment ceremony, which according to Suhler (1996, n.d.) involved water, or was part of the reentry ceremony. Reentry of royal tombs elsewhere did sometimes involve fire rituals (Eberl 2005; Fitzsimmons 2009; Stuart 1998).

This was the final performance for the king buried here. The people carrying out the reentry rituals placed the stones to the north and south of the king, with some over the area of his legs. They did not cover the ceramic offerings to the northwest of the king's head, most of the offerings to the southwest, or the decorated plate at his feet. Now the head of the dead ruler emerged from the midst of a symbolic hearth laid out around the mausoleum's central east-west axis. This image draws parallels with contemporary Yukatec Maya domestic hearths. Placed in the central parts of residences, these hearths connect with ropes hanging from the ceiling. On a cosmological plane, contemporary axial hearths evoke mythological navels and umbilicus cords that connect the human world with the celestial sphere (Tiesler 2016; see also Taube 1994:668–669). Having completed lustration and vitalization in the otherworldly womb, this venerated ancestor was now reckoned in a different time-space context (McAnany 1995; Taube 1994). It is quite noteworthy that the monarch of Burial 23 was ritually revitalized not only by firing or smoking the chamber's interior as in other documented cases but mainly by placing in the chamber symbolically charged hearth matter. In both cases the association of the deceased with the hearth, with its allusion to the Creation Hearth (Freidel et al. 1993; Taube 1998), conjured the transformation of the dead paramount into an ancestor and encouraged his ascent into otherworldly celestial spaces.[2]

After reentry, those who sealed Burial 23 covered the antechamber and tomb with an impressive mass of rubble construction with a plaster floor that was part of a summit platform surface on the pyramid some eight meters above the main plaza of the acropolis. We know from our excavations of this phase (identified as Str. 6F-3-5) that it also had subsurface corridors and chambers in it (figure 7.2, Stanton et al. 2010; Suhler and Freidel 1998). We also know that the people who built the next phase, Str. 6F-3-4, must have known with precision where the tomb and the antechamber were in order to revisit it, long after the skeletonization process of the deceased was finalized, as we have argued above. Therefore, the builders of Str. 6F-3-4 certainly regarded the king in Burial 23 as an eternal performer. As they covered over Str. 6F-3-5, they built masons' walls into a U-shape enclosure facing east over the antechamber of Burial 23, a symbolic cleft in the mountain facing toward the rising sun and resurrection.

It is also clear that the reentry rituals were associated with resurrection and connected the tomb to the subsurface corridors they built inside Str. 6F-3-4. The king, as resurrecting deity, is a performer in architectural space designed to facilitate the journey from the underworld into the heavens from at least the Early Classic through the Postclassic periods when the subsurface corridors and chambers were ritually terminated for the last time (Stanton et al. 2010; Suhler 1996). If we are right in our assessment of Str. 6F-3-6, this thematic function spanned the Formative to the Postclassic. Indeed, if the king who reestablished royal government at Yaxuná in the Early Classic knew about and used an existing subsurface performance place on Str. 6F-3, it would suggest that the north-south axis was an important royal design in the Late to Terminal Formative, and it would help explain why he chose to be buried in the North Acropolis rather than in the East Acropolis or elsewhere in his new capital.

A SUN KING FROM THE SOUTH

As we have mentioned, Burial 23 contained a mature male who was placed on the marl-embedded floor of a stuccoed and vaulted chamber within Str. 6F-3-5, the northern temple of an acropolis triad (Stanton et al. 2010:164–174; Suhler 1996). His bone chemistry suggests that this man was a foreigner to the immediate vicinity (see chapter 2) who came to serve as the ruler of the Yaxuná, perhaps on behalf of Kaanul, the kingdom of the Snake Kings, further south.[3] Before passing during his fifth life decade, this dignitary likely had time to establish himself among Yaxuná's local aristocracy, reflected not least of all by the exquisite attire inside his mausoleum. The king lay lavishly adorned with royal regalia; among the offerings figured stacks of polychrome vessels, some with avian motifs, a trefoil greenstone royal diadem jewel (matched with two others from the antechamber and construction fill), and other carved objects, deer antlers, and a turtle carapace. The overall assemblage, to be described in detail below, recalls in style and meanings the regal attires of other Maya lowland kings of its time, which strongly evoke the fiery rebirth of the Maize God (Coggins 1975, 1979; Houston et al. 2015; Schele and Freidel 1990; Stuart 2004; Taube 2004a).

The decorated plate next to his head, discovered on its side, may have been displaced through taphonomic processes; but it may have been positioned there during the reentry. We think the contextual pattern here shows that the people who reentered the tomb used the burnt hearth rocks and ash that they brought in to build a new symbolic mountain around the body of the king. The image of mountain in Classic Maya iconography is a zoomorphic mask with a cleft in the top, called *witz* in ancient Mayan (Stuart 1987). From this cleft arise resurrected beings, like King Kan Bahlam of Palenque garbed as the Maize God standing on the clefted true mountain of maize on the Panel of the Foliated Cross (Schele and Freidel 1990). As Schele and Mathews (1998:42–43) describe, the clefted mountain place of the Maize God's resurrection was a widely understood sacred locality. We think it quite possible that the exposed area of the body of the Burial 23 king was designed to place him in the mountain cleft formed by piling the burnt rocks and ash to either side of him.

There is another kind of sacred mountain that has fire in its cleft, as in the case of the base panel mask of Stela 9 dedicated in AD 504 at the site of El Perú-Waka' in Guatemala (Freidel et al. 2013). Another name associated with this fire mountain on this stela is Wite' Naah, which translates as Origin or Foundation House according to David Stuart (2004). That is a reference to a fire-and-water–related religious cult introduced into the Maya world from highland Mexico (Fash et al. 2009) by a Teotihuacan lord named Sihyaj K'ahk'. This is relevant to the present discussion because underneath the rough rock-clefted pattern in Burial 23 archaeologists discovered traces of a small, intense fire on a flat rock placed next to the middle of the king on the south side. On top of that fire the devoted had placed a large fragment of a striated water jar. The symbolic association of fire and water is an important part of the Wite' Naah cult. The people who reentered Burial 23 were the same people who overbuilt the tomb with a new pyramid. In the course of raising this new pyramid they built a large U-shaped construction pen around the antechamber entryway of Burial 23. This construction pen was basically a cleft in the mountain facing east. The ash and hearth rocks placed inside Burial 23 transformed this clefted mountain into a Fire Mountain like the one depicted on El Perú-Waka' Stela 9 described above. In light of the evidence for Teotihuacan involvement in this tomb reentry as seen in the incised bone depicting a *ko'haw* battle helmet place in the tomb, the builders of the new pyramid here may have regarded it as a commemorative Wite' Naah Fire Shrine.

In Charles Suhler's (Stanton et al. 2010; Suhler 1996) reconstruction of events based on observation during the process of excavation, the majority of artifacts were arranged in the tomb prior to the introduction of the body of the deceased. These concentrations of artifacts were in themselves contextually significant and provide the basis for understanding aspects of the eternal performance of this ruler. As the artifacts have been technically described elsewhere (Stanton et al. 2010), we will focus on the significance of the inferential function and material symbolism of these offerings and use these interpretations to better situate the new forensic study of the remains of the deceased. In general, the theme evinced in the tomb furniture is the transformational journey of the ruler through death to resurrection of the soul. In this theme the ruler in Burial 23 conforms to the expectations of Maya divine kingship as practiced elsewhere and as documented pervasively in Classic tomb contexts of the southern lowlands.

In the northwest corner of the chamber, mourners placed a collection of ceramic vessels that included two small straight-rimmed jars with sherd lids, a small flaring rim jar with lid, and a larger flaring rim jar with a lid. These vessels showed traces of wrappings, and we infer that they were deposited with liquid contents because of the lids. Adjacent to these lidded jars, they placed a pedestaled cup upside-down in a gutter-spouted bowl set inside a basin. The straight-rimmed bowl showed evidence of much wear on the bottom and blackening from heating. Next to this assemblage and set on edge we found a basal-flange bowl with what Michael Coe (1978:78, Plate 11) identifies as the "anus" glyph around the outer wall and a depiction of a person in ecstatic trance transforming into a flying creature. The glyph in question (T61.77.585a) occurs in the text and is painted on the vessel discussed by Coe as a series of red-centered circles separated by crossed-bands. On a picture of a vessel published by Kerr (K1890), a similar band of circles separates two scenes of enema users in the characteristic pose of self-administration. But in this case the circles are clearly variants of the anus glyph with fine black swirling lines depicting the sphincter muscles within the circles. On the outer surfaces of the basal-flange bowls in Burial 23, the sphincter muscles are depicted as fine undulating black lines on beige backgrounds (see Stanton et al. 2010:figure 5.189). The rims of the vessels are decorated with circles like those forming bands on the vessels depicting enema rituals described above. Returning to the vessel in question at the western end of Burial 23, this person is in the pose of self-administered enema (Barrera Rubio and Taube

1987; Furst and Coe 1977; Stross and Kerr 1990) with the clyster evolved into a scorpion tail. In addition to the vessels discussed above, other examples of paintings depicting more realistic individuals in this pose are well represented in the corpus of Maya vases published online by Justin Kerr (e.g., K5011, K5025, K5067). The strange transformation creatures have a certain resemblance to the Caban glyph that reads *chi*, 'sweetness,' and that marks vessels of intoxicating drink in the enema and drinking scenes of the Classic vase corpus (Stross and Kerr 1990:figure 17b). Returning to the clyster, the modern Maya identify the constellation Scorpio as this insect and likely did so as well during the Classic period (Freidel et al. 1993). The face of this flying transformation person has the wide-open eye denoting intoxication or a trance in Maya vase imagery (see K5067) and a spiked corona around the head, perhaps a form of entopic hallucination depicted elsewhere in Classic Maya graffiti (Haviland and Haviland 1995).

Yet this spiked corona may also depict a *Datura* blossom. Barbara Kerr (2007) made a cogent iconographic argument for the identification of a spiked feathery element ornamenting the snout and head of Classic Maya vision serpents as blossoms of *Datura*. This plant is found pervasively in the Maya area and its seeds, blossoms, and stem contain powerful hallucinogenic narcotics well known to many indigenous peoples of the Americas. While enema potions might have contained other active ingredients, the atropine and scopolamine in Datura have the effect of confusing nerve messages from the extremities to the brain, resulting in an experience of flying. These drugs also deaden pain. As detailed in the forensic analysis, the deceased was suffering from painful degenerative arthritis of the spine. A polished hollow deer bone tube was directly south of this bowl and above the head of the deceased. We identify this as the syringe of an enema clyster made with a flexible leather bladder (Stanton et al. 2010). Such flexible clysters with rigid syringes are depicted in the several Classic painted vase scenes showing enema use and rituals surrounding this use (Stross and Kerr 1990). There is a second plate, almost identical to the one described but with the variant that the entopic hallucinations are depicted as a shower of dots. The body of the deceased, once introduced into the chamber, was framed on the sun path by these two flying trance transformation figures (plate 7.4).

In light of this contextual analysis so far, we suggest that the ceramic vessels in the northwestern corner of the chamber are an Early Classic variant on the feasting serving vessel and container set often found in Classic royal tombs in the southern lowlands and that a variant is a set of vessels for holding enema potions, warming potions for pouring into clysters, and a basin for the ensuing vomit produced while the performer goes into a trance. The jars depicted on Classic Maya vases identified by Stross and Kerr (1990) as containing intoxicating liquid for enema rituals have the general shape of the jars in this chamber and are sometimes depicted bound in rope or cloth. If we are on the right track with this analysis, there are several other Early Classic tomb chambers containing gutter spouted cups and bowls, pedestaled cups, and pedestals (plate 7.5). Some of the tombs containing such ceramics are undergoing contextual analysis (Freidel et al. 2010; Houston et al. 2015; Juan Carlos Melendez, personal communication to Freidel), but so far these investigations do not show clear

FIGURE 7.3. Ceramic lid knob depicting Chaak or Akan (photo by Yaxuná Project, Selz Foundation).

association with enema ritual such as that found in Burial 23. Merwin and Valliant (1932) illustrated assemblages with these characteristics from Holmul found in Early Classic burials inside reused and buried temple rooms. They also reported discovery of three deer bone polished tubes, two pierced for attachment by sewing to flexible material and one with a bone ring on it suitable for fastening a flexible clyster. Unfortunately they did not report the context for these tubes explicitly. However, it is possible to infer that the tubes came from the rooms with the ceramics in them. Finally, with regard to enemas and transformation as part of Classic Maya rituals, Michelle Rich and her colleagues (Freidel and Rich 2015; Freidel et al. 2010; Rich et al. 2010) discovered a unique figurine funeral assemblage in El Perú-Waka' Burial 39 dating to the seventh century. In that assemblage is a young man carrying a gourd enema clyster, a seated old shaman "howling," a visage associated with enema ritual by Stross and Kerr (1990), and an image of the deceased king as a kneeling penitent Maize God preparing for resurrection (Rich and Freidel 2017). The Early Classic enema potion ceramic assemblage is not present in this Late Classic tomb.

The southwestern sector of the Burial 23 chamber contained a complex assemblage of materials. Segueing from the theme of enema ritual and inebriation, one of the artifacts in this assemblage is a small, well-crafted ceramic object (figure 7.3) that depicts the severed head of a deity. The slack jaw and lolling tongue of the head make this identification clear and unequivocal. Although Charles Suhler (1996; Stanton et al. 2010) suggests that this is a carved ceramic talisman, we now propose that it is the snapped-off and reworked head of a jar lid. This tradition in lowland ceramics of small cylindrical jars with effigy deity lids began in the Early Classic and continued into the Late Classic. Unfortunately looters have found most of the jars and lids. A high-end jade mosaic version of one of these effigy lid jars found in Burial 196 at Tikal appears to portray the ruler, Yik'in Chan K'awiil, and to show that it is a White Flower Soul Cache vessel, a distinctive reliquary, for one of that eighth-century king's souls (Freidel and Guenter 2007). A second mosaic jade cup in Tikal Burial 116 portrays King Jasaw Chan K'awiil and is inscribed with a text declaring that it is his chocolate cup. If we are correct in our assessment, then our effigy head was originally part of such a sacred container. The deity depicted on this ceramic head from Burial 23 is not obviously Akan (Grube 2004), the spirit companion and god associated with self-decapitation and enema ritual inebriation. The visage has the alveolar bar and beard associated with K'awiil (Kerr 7023, 7024), a well-represented deity in the looted corpus of lidded effigy knob soul cache vessels. Yet the slack jaw and lolling tongue on this head, pierced (presumably from autosacrifice), is unique and declares this a severed head. Akan, the god in question, is repeatedly depicted severing his own head from his body (Grube 2004). The Burial 23 artifact was well finished to obscure snapping off of a lid. Akan is a *way* spirit specifically associated with enemas (Grube and Nahm 1994), and we think that the inclusion of this carved head reinforces the thematic concern with transformation through ecstasy. The ceramic head, however, also relates to the tripod of deer bones discussed below.

The southwestern assemblage includes one part of a remarkable incised bone in the shape of a weaving batten or the inset backing of a throwing stick (figure 7.4). This artifact was located in fragments against the western wall of the chamber, evidently disturbed by rodents. The closest artifact comparison would be the famous scrimshawed bones discovered in Late Classic Tikal Burial 116 (Moholy-Nagy 2008), which Freidel and Rich (2015) suspect were used as bone dice in casting and divination. The images on this bone appear to be a combination of glyphs and pictographs, perhaps analogous to the remarkable inscriptions found on the summit temple of Structure 10L-26 at Copán (Stuart 2005). The top glyph may read *nikte'*, 'flower,' and it suggests that the object is perhaps related to the idea of *sak nikte'*, 'white flower,' a metaphor for tomb chamber (Freidel et al. 2007; see Scherer 2015 for a nuanced discussion of this glyph and its possible decipherments and meanings). The next glyph reads *ajaw*. This is followed by a depiction of a skeletal bird in profile, possibly an owl or other raptor. This image surmounts a profile depiction of an Early Classic style *ko'haw* or plated war helmet of the kind introduced from Teotihuacan during the New Order. Finally, there is an image that appears to combine the crossed-band decorated shell headdress of Chak-Xib-Chak with a hand carrying an axe. This artifact is unique, so such interpretations must be tentative.

Nevertheless, if there is a reference to *kaloomte'* then it is possible that this artifact relates to the reentry of the tomb and to the protagonist of the interments in Burial 24 to be discussed below. The title *kaloomte'* was used exclusively by Teotihuacan-affiliated lords Sihyaj K'ahk' and Spearthrower Owl before the fifth century AD, and Burial 24 and the cache above it in Str. 6F-4 show evidence of Teotihuacan affiliation. This bone was discovered along the western wall of the chamber. A small turtle carapace was also located near the western wall. Turtle shells were used as drums or rasps in musical performances, although this shell is small and likely served as a symbol of such instruments or of the resurrection of the Maize God

FIGURE 7.4. Incised bone artifact (photo by Yaxuná Project, Selz Foundation).

(Suhler 1996), associated with the music of the carapace. Stross and Kerr (1990) note that the turtle drum could be associated with the deity Akan.

Near the head of the deceased, in the southwest corner of the chamber, the ritual specialists placed a concentration of materials associated with divination and sacrifice. At the center of the concentration are three worked deer bones with incised decorations. One of these deer bones had a ceramic ring around it (figure 7.5). The trefoil jade royal diadem jewel mentioned previously was jammed into one end of one of the deer bones. The incised decoration on these bones depicts knots framed above and below by hafted blades. These blades, in turn, pierce bifurcated scrolls. We know that these three bones together constituted a tripod. On the West Wall of the Pinturas Building at San Bartolo (Saturno 2009; Taube et al. 2010) there are three such bone tripods with sacrifices on top of them. In the case of these Late Formative examples, the individual bones are decorated with twisting motifs, but the tripods are bound with knots like those that appear on the Burial 23 examples. The association with sacrifice is conveyed on the Burial 23 bones by the sacrificial knives framing the bundle knots. The West Wall mural scene references the ordering of the world with four trees and four sacrifices and the establishment of the center with the sacrifice of the Principal Bird Deity, solar spirit companion of the Creator God, by the Maize God. These acts of sacrifice are exemplary for Maya divine rulers, who personified the Maize God and the Sun God. The West Wall mural includes a royal accession of a human king emulating the accession of the Maize God.

The other example of the bone tripod is the seat of a remarkable effigy deity in Burial 10 at Tikal, the likely tomb of King Yax Nuun Ahiin dating to the early fifth century (W. Coe 1990; Kerr 4884). This image, often interpreted as a god of decapitation sacrifice (e.g., Schele and Freidel 1990), is of an old snaggle-toothed god seated on a bone tripod and displaying a small head in his uplifted hands. The bone tripod is covered in the front by what appear to be jagged knives. It is the head held by this deity that gives rise to his identification with decapitation. In light of our discussion of the ceramic severed head talisman and the god of

FIGURE 7.5. (a) Manatee bone disassembled tripod with ceramic ring and shell tokens, deer cowrie (broken) in the lower left corner; (b) close-up of the tripod's supports (photo by Yaxuná Project, Selz Foundation).

inebriation Akan, such an association with the bone tripod seems plausible. However, the pose of holding the head horizontally on open hands, the small size of the head, and the calm open-eyed, closed-mouth expression of the face all suggest that this is not a sacrificial severed head but rather a talisman mask of a kind that occurs frequently in later Classic painted vase scenes. Erik Boot (2005) has identified the masks held by scribes in these scenes as evidence that these are mask sculptors as well as painters and scribes. He associates texts on the vases with the verb *pak'*, which evidently means to carve but also to shape and to arrange. Freidel and his colleagues (2015) point out that most of the scribes holding these masks on open palms are gazing at them without any suggestion that they are carving or painting. They propose that the primary metaphorical reference here is to shaping and arranging, which are acts associated with divination and prophesy as in the creation text of the Quiche Popol Vuh (Christenson 2007).

The headdress of the Tikal old god is decorated with two disks on which are arranged four olive shells in the pattern of the day glyph *k'in*. Freidel and his collaborators suggest that ancient Maya used shells for casting, divination, and for currency. There are many examples of olive shells arranged in patterns in the painted vase corpus, and shells are one of the materials depicted as cast by Maya on Classic stelae and incorporated into the shower of precious materials reading *k'uhul*, 'holy,' in the emblems of Classic dynasties. Finally, we will see that there is a carved jade in the form of a profile face in Burial 24 that has a crossed-bands motif in the headdress. This may reference the same deity, as it resembles the arrangement of shells on the Tikal Burial 10 figure's headdress.

The carved greenstone diadem jewel we discovered jammed into the end of one of the bones underscores the royal nature of the bone tripod sacrifice discussed in the context of the San Bartolo mural (figure 7.6a). This jewel is of a type distinctive to northern lowland Maya Early Classic and otherwise found in Early Classic context at Dzibilchaltún (Taschek 1994: figure 24). The Yaxuná jewel depicts a face outlined in polished grooves with a tripartite headdress. It is the tripartite design of the headdress that we take as diagnostic of its significance as a royal diadem jewel of a kind originally termed jester god (Schele 1978) and later traced to Olmec Middle Formative origins by Virginia Fields (1989, 1991). The other two greenstone jewels associated with Burial 23, one found in the antechamber white matrix and the other evidently deposited in construction fill above that level, also have tripartite headdresses. One of the jewels found at Dzibilchaltún certainly has a tripartite headdress; the other is undulated but less clearly tripartite. Jennifer Taschek proposed (1994:82–84) that the closest jewels resembling the Dzibilchaltún ones came from the Early Classic tombs discovered at Nebaj in the Guatemalan highlands (Smith and Kidder 1951). However, those jewels do not have the tripartite headdress, although the grooved outline carving is similar. There are other Early Classic diadem jewels at Yaxuná, discovered in Str. 6F-4 as discussed below. These jewels are later than the Burial 23 diadem and evince the range of variability in diadems used in the Early Classic at Yaxuná, including several likely Formative era heirloom jewels as also discovered at Dzibilchaltún. David Stuart (2012) narrowly defines Classic period jewels of majesty based on careful epigraphic and iconographic arguments, and the Yaxuná diadem jewels would all likely fall outside his range of "*huunal*" jewels. Nevertheless, the wide-ranging variations on tripartite headdress found in these jewels still fall within the consensual parameters of Maya and Olmec specialists as royal jewels declaring owners to have status as rulers (Freidel 1991, 1993; Freidel and Suhler 1995). In this analysis, the important point is that the royal jewel associated with the deceased in Burial 23 is a northern lowland type.

To the south of the three-bone tripod, mourners placed two concentrations of shells, one of 37 small cowries and the other of 40 small limpets. Both of these shell species can be linked to ancient Maya religious thought. The limpets reference the giant limpet, which,

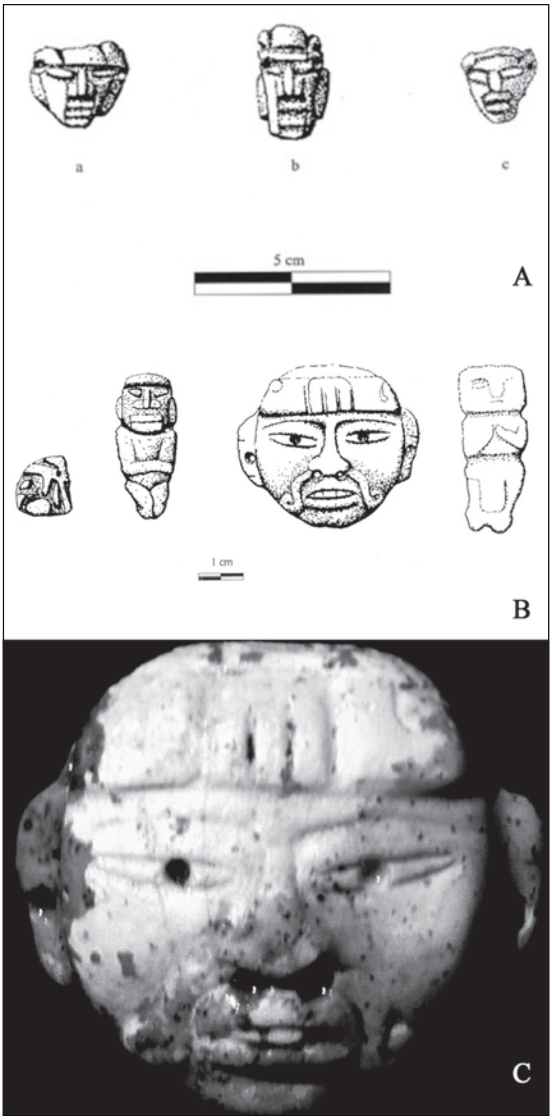


FIGURE 7.6. Royal diadem jewels from Burial 23, the antechamber of Burial 23, and the adjacent construction fill.

when its center is carved out, is a sacred jewel worn as a pectoral by Maya kings of the Classic period. The cowries reference a giant cowrie to the south of these two shell concentrations. This giant cowrie is unusual. It is a deer cowrie in modern parlance, and in our view it is visually referenced in the painted vase corpus of the Codex Style (Grube and Nahm 1994) as the embodiment of the Chichan, the Deer Snake spirit who is the ally and companion of the K'uhul Kaanul Ajawob, the lords of the hegemonic power based at Dzibanché in the Early Classic period. The deer cowrie has two patterns—one displays white dots on a brown field (like the back of a fawn) and the other displays beige stripes on a brown field. We propose that the first pattern depicts the open deerskin bundle with white diving tokens on it;

the second pattern depicts the closed deerskin diving bundle. The *way* spirit of Chichan is depicted as this second, closed-bundle representation of the shell. We suggest that the deer cowrie shell represents the divining face described above in relation to the old god seated on the three-bone altar, holding a face as discovered in Tikal Burial 10. Our identification is based on a specific contextual comparison.

Specifically at El Perú-Waka', Michelle Rich and her colleagues (2010) discovered a seventh-century royal tomb of a vassal king of Kaanul who had a bundle of 64 miniature effigy spindle whorl diving tokens and a cut upper section of a giant deer cowrie shell. Next to the shell Rich found a concentration of dozens of carved bone sticks. These elaborate polychromed sticks included several depictions of hands holding shells with faces inside them. Others just showed hands holding faces. Erik Boot (2005) argued that the hands holding faces on the corpus of Late Classic painted vases depicting scribes with this gesture references the ancient Mayan verb *pak'*, 'to carve masks' but also 'to shape by hand, to order, to arrange.' We propose that this verb alludes to casting tokens, both small ones as "ones" and sticks as "fives" in numerical prophecy. The El Perú-Waka' Burial 39 bundles of sticks, tokens, and giant deer cowrie suggest that the deer cowrie in Burial 23 was such a "face" and references conjuring the Chichan Deer Snake spirit companion of Kaanul kings. Such a contextual interpretation is commensurate with the conjuring of a deer *way* spirit in an assemblage of 23 figurines at the foot of the Waka' king in Burial 39. If we are correct in this assessment then the king in Burial 23 was not only from the south but also from Kaanul.

Adjacent to the giant deer cowrie, excavators discovered concentrations of small cowries and limpet shells, three of which were painted red. In light of the foregoing discussion we are of the view that these were casting tokens used in divination. Among these shells were some splinters of manatee bone, possibly calculating sticks. Giant marine limpet shells were carved by the Early Classic Maya to be worn as royal pectorals. One such ornament discovered in the Hunal royal tomb at Copán in Honduras (Bell et al. 2004:134, plate 4) was inset with an elaborate mosaic depicting the Feathered Serpent with an ancestor emerging from its mouth. It is possible that these tiny limpets also carried important sacred meaning. Reinforcing the notion that shells relate to faces, there was a carefully carved effigy olive shell "skull" in *Spondylus* in this assemblage. Olive shell "skulls" are well documented in royal tomb contexts elsewhere, and in Burial 24 discussed below, but this *Spondylus* effigy is remarkable and unique. King U Kan Le'k Tok', a late eighth-century ruler discovered at Ek' Balam, was also interred with large quantities of shell tokens, along with unique carved shell cacao bean counters. There are other examples of such tokens in elite tombs at El Perú-Waka' (Eppich 2007; Freidel et al. 2012). Thus, the ruler in Burial 23 was not unique in his eternal performance as a numerate individual using calculating and divining tokens.

Another shell talisman next to the ruler on his left side was carved in the form of a crouching creature with cross-hatching on the back and a nimbus around the head. This looks very much like stylized creatures embroidered onto Maya textiles in contemporary societies in both the highlands and lowlands. It might represent a frog or toad of the kind that symbolized royal rebirth. It is crouching on a profile polymorphic head with a beard. This might depict a *way* spirit companion (for discussion of *way* spirits, see Grube and Nahm 1994; Houston and Stuart 1989). The theme of rebirth is evident in a concentration of objects placed in the vicinity of the hands over the groin (figures 7.7b and 7.7c), the birthing place as seen in other royal tombs such as the sarcophagus of K'inich Janaab Pakal at Palenque, where the object in the groin was a jade image of the Maize God. These materials in the Burial 23 case likely were bound into the wrappings of the body. Clutched in the hands of the ruler were three large, fine jade beads, possibly representing the Three Stone Place of Classic creation mythology (Freidel et al. 1993). Karl Taube (1998) made the case for this hearth being the jade hearth. Below these beads was a carved *Spondylus* face of the youthful Maize God. This image can be identified as the Early Classic Maya Maize God as defined by Karl Taube (1985) by the presence of the frontal tonsure and the flanking side curls. Along with these features this image has the upper buckteeth characteristic of the Early Classic Maize God. The material, *Spondylus* shell, is red, the color of east and resurrection, and it is this shell that is part of the cosmic womb called the Xok Shell girdle ornament worn by the Moon Goddess and the Maize God. This image of the reborn Maize God is accompanied by two "Charlie Chaplin" figures (Mora-Marín 2015) of a kind of deity shown with arms in the bundle-cradling position pervasively distributed in the Late Formative and Early Classic lowlands, and a very fine-quality jade profile face of a beaked personage wearing a headband. This last jewel might represent the logograph for *itz'at*, 'sage' (see Freidel et al. 1993:figure 2:28).

All together, we propose that the materials in the groin area explicitly denote resurrection in emulation of the Maize God. Placing god figures in the groin area may be a trope in interment of divine kings and queens. King K'inich Janaab Pakal was buried with a jade figure tentatively identified by Linda Schele and Peter Mathews as the Maize God (1998:figure 3:39). In our view, and that of Scherer (2015:108, figure 3.2), this is clearly again a tonsured Maize God. Queen K'abel of El Perú-Waka' (Navarro-Farr and Rich 2014:figure 1.18) had in her groin area a stalactite fragment carved in the image of one of her polity's tutelary deities, Akan, bleeding his neck with an axe. The blood here was depicted with cinnabar across the neck area of the figure. It is certainly the case that, when preservation of context allows, in the case of Maya royal tombs we can discern the deliberate arrangement of materials. Most commonly stingray spines and other bloodletting instruments are placed in the groin area (Fitzsimmons 2009:90). Variations on royal performance in death include the placement of the famous Altún Ha Huunal Jade of royal majesty (called the Sun God) on the right hand of the ruler in Tomb 4 of Str. B4 (Pendergast 1982:figure 33, Tomb B-4/7). A most intriguing example of this kind of tableau macabre is in the tomb of the Red Queen at Palenque (very likely Queen Ix Tz'akb'u Ajaw, Pakal's wife [Tiesler et al. 2004]). There, a whole *Spondylus* shell, symbolic of the cosmic womb, was placed above the queen in the position of an ancestor as seen typically on carved stone monument depictions. Within the *Spondylus* shell was a small carving of a royal figure wearing a dress and the same three-celt royal belt insignia that adorned the queen herself. So here perhaps is the queen being perpetually reborn in heaven (González Cruz 2011:175). The materials we discuss here and their contextual pattern in our case confirm that the Yaxuná Burial 23 ruler was indeed a divine ruler in the mainstream fashion of the Classic period, despite the absence of royal inscriptions at Yaxuná declaring the presence of such divine rulers such as those discovered in the southern lowlands.

Other artifacts directly associated with the body of the ruler include a remarkable composite drumstick made of deer antler and bone (figure 7.6). This was placed above the head in the position of antlers, suggesting that the deceased was performing as the human Chichan, an anthropomorphic deity wearing antlers, sometimes shown with deer ears, on codex-style vases from the Mirador area. A small turtle shell found west of the headdress might represent the kind of drum the Maize God played with an antler tine drumstick, as depicted, for example, on the West Wall mural of the Pinturas Building at San Bartolo in Petén (Taube et al. 2010). Jade and shell beads of various sizes were scattered around the upper torso of the deceased, some likely adornments of the body and others possibly sewn onto the bundle shroud. Yet the most astonishing artifacts were two finely carved sprocketed *Spondylus* earflares. A similar flare was reported at Dzibilchaltún, but not as clearly carved and not in such a context. These flares certainly declare that this ruler was eternally performing as the deities who characteristically wear such *Spondylus* adornments. The deities are the rain god Chaak and the watery sun god Hun Yeh Winik, One Tooth Person (God I of the Palenque Triad), both of course associated with the return of the beneficent rains to nourish the crops.

A final performance feature of the original interment of the ruler in Burial 23 was discerned by Charles Suhler (Stanton et al. 2010; Suhler 1996). That was the likelihood that the bundled body was "floated" into a thick slurry of white marl poured into the chamber after the surrounding artifacts were arranged in it. The body slowly sank into this white water, "entering the water" being a prime metaphor for royal death in the glyphic texts of the Classic period. Suhler speculates that this white marl symbolized the cosmic east-west path of the sky, with the ruler entering the road in the west in order to resurrect in the east. Such reasoning makes sense in light of the earflares of the dawning eastern sun on this king. In light of the evidence suggesting that this ruler also entered the supernatural world in ecstasy engendered by psychogenic enemas and drinks, it is possible that the metaphor of white dreaming place, *sak waybil*, was also symbolized here. *Sak waybil*, as well as referencing such an occult locale, also resonates with an important royal title, *sak wayis*, sometimes glossed as 'white goblin' or 'bright spirit' in the historical literature. It is a title favored by rulers of Classic period Kaanul and their vassal kings and queens in inscriptions in the southern lowlands.

Given the limited information available on Classic period royalty at Yaxuná, it is quite feasible that the king in Burial 23 was a foreign interloper, simply given his isotopic profile as a foreigner, as discussed in previous chapters. Likewise, the location of his tomb suggests that he was indeed a founder of a new government there. The ceramic offerings are decisively southern in style, so he may well have come from a kingdom in the southern lowland area to reestablish Yaxuná to something of its former greatness. Yet his royal diadem jewels are of northern lowland style, so his kingship references the ambient polities of the northern lowlands. He may have been an emissary of Kaanul, the hegemonic polity based in southern Quintana Roo and Campeche in the Early Classic period. In light of the possibility that Formative Yaxuná was a salient of a southern hegemony, as discussed earlier in this volume, such a return of a king might have been regarded as not only acceptable but celebrated by those living in the shadows of the ancient temples there. The notion of a dynasty at Yaxuná is predicated on the principle that divine kings were dynastic in the southern lowland Classic period. That may or may not hold as the research has to date produced only two royal tombs at the site. What can be said with certainty is that this mature man, although he suffered physical ailments like degenerative arthritis, was a true divine king in the centuries-old tradition of divine kingship found depicted in the southern lowlands on the Formative period Pinturas West Wall mural at San Bartolo, in the carved precious royal jewels of Cache 1 at Cerro Maya, and in the myriad Early Classic expressions in that part of the Maya lowlands. He was not the first king in the Yaxuná community, for Cache 2 in Str. 6F-4/4th, as discussed below, contained heirloom Formative-style diadem jewels in what was certainly a cache of royal insignia jewelry. And, as we discuss in the following section, the lords of Yaxuná strived to legitimize their succession even when it was the result of conquest and replacement of a vanquished king.

ROYAL BURIALS AS FORCED TERMINATION

Just like Str. 6F-3, the Str. 6F-4 locality was actively used in the Terminal Formative. Excavations in the plaza in front of it show that the eastern support platform for the North Acropolis was in place and within 50 cm of its final elevation at that time. The deepest exposure by the Selz Foundation project in the building locality itself, Str. 6F-4-6, yielded Late Formative sherd material (Stanton et al. 2010:182). The nature of the Phase 6 building remains enigmatic, but it was probably for public purposes given its location and orientation as part of a triadic group. The ensuing two building phases were certainly Early Classic pyramids. Stair treads of 6F-4-5 accessing the summit were preserved under the masonry chamber of Burial 24. Apparently the laborers responsible for creating that chamber dug deep enough to remove all traces of the Str. 6F-4-4 stairway that must have lain over this earlier one. By footing the masonry chamber on stair treads, the people buried inside that chamber were eternally performing on the stairway, which in turn ascends from west to east in the direction of the dawning sun. While we have no evidence from our summit excavations of a superstructure associated with Str. 6F-4-5, we found the remains of 6F-4-4 on a summit temple.

This masonry superstructure had at least one rectangular room narrow enough to spring a corbel vault. All traces of such a roof were deliberately removed when the temple was terminated, stripped of wall and floor plaster, and encased inside retaining walls of a platform associated with the major redesign of the locality in Str. 6F-4-3. Because of our limited summit exposure we cannot be certain that the eastern-finished block-stone retaining wall of the Phase 3 platform was not also the inner surface of a standing wall of a two-roomed tandem-plan Phase 4 summit temple. The distance of that wall from the eastern doorway of the one certain summit room is appropriate for a second room also spanned by a corbel vault. Given the ubiquity of two-room tandem-planned temples, this seems a likely prospect, but the outer masonry facing of this western wall slumped off the summit long ago. Whether the summit temple faced both east and west or just west, its principal orientation was certainly to the west and to the plaza of the triadic group.

With the above structural evidence, we believe that the king buried in Burial 23 evidently rebuilt the triadic group when he came to power in Yaxuná, refurbishing the 6F-4 locality along with the 6F-3 apical pyramid of the acropolis to the northwest. In contrast, this elaborated westward-facing shrine on a pyramidal building platform in its final Phase 4 design reemphasized the east-west axis of the Formative ceremonial center (Stanton and Freidel 2005) and complemented the north-south axis of the city enhanced by the stranger king and his Early Classic refurbishment of Str. 6F-3. As we will show in our discussion of Burial 24, we think its placement in this building is specifically related to the east-west axis of Str. 6F-4 and to the dedication of the new temple to sun and moon deities and to the agrarian year.

The radical redesign of the Str. 6F-4 locality (structural phase 6F-4-3) as a performance place included the building of the tomb chamber for Burial 24 in a terrace over a new frontal range structure (figure 7.7). That structure had a large corbel-vaulted chamber with five doorways facing a broad new stairway giving wide visual and physical access to the plaza below. Above the terrace, which had three distinct levels, was the summit platform encasing the terminated shrine of Phase 4. Along the east-west centerline of the floor area of the terminated shrine, the builders placed two cached offerings. These symbolically charged offerings are clearly coeval with the overall transformation of the building, the creation of the Burial 24 tomb chamber, and the interment of the people in it, and so we will discuss them in the section concerning the contextual analysis of the tomb offerings and arrangement of the individuals. A relatively narrow stairway on the northern side of the new building gave access to the terraces from the stairway area below. Altogether, the new building had three major performance places: the lower stairway and area fronting the five-doorway façade; the terraces, including the tomb chamber of Burial 24; and the open summit of the new upper platform encasing the terminated temple. The individuals interred in Burial 24 were thus doubly engaged in performance, once in a stairway of the original building design on which the tomb was footed, and then again in the upper terraces, which were clearly made for wide visual access from the plaza of the North Acropolis.

In light of the sacrificial nature of the Burial 24 tomb contents in Str. 6F-4 and its near contemporaneity with Burial 23, we have previously argued (Freidel and Suhler 1998; Stanton et al. 2010; Suhler and Freidel 1998) that the regal occupant of Burial 23 was perhaps affiliated with the royalty placed into Tomb 24. This high elite status is manifest in the royal jewels and diadem fragments accompanying the hypothesized king and two of the women in the tomb. It should be noted that no evidence from the human remains has been discovered to test the hypothesis of family affiliation, although the first Yaxuná Project did attempt some DNA extraction. This context and the coeval caches deposited in the summit of 6F-4 point to an adoption by the king commissioning these deposits of symbols reminiscent of Teotihuacan and the New Order alliances of Kaloomte' Sihyaj K'ahk', adversaries of the Kaanul hegemony (Martin and Grube 2008; see also Freidel et al. 2007, 2013). These

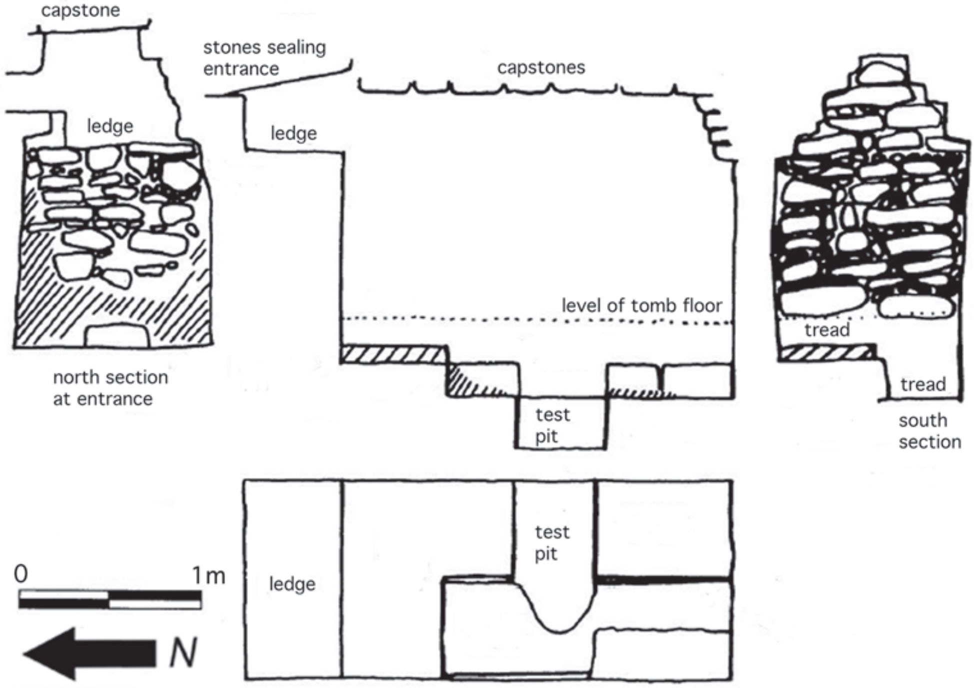


FIGURE 7.7. Burial 24, Yaxuná; Chamber layout (Yaxuná Project, Selz Foundation; Bioarchaeology and Histology Laboratory, UADY).

offerings include slab-footed tripod vessels (plate 7.7a), a signature of the era of the New Order whether emulative and commemorative local vessels, as in the present case, or rare imports as in the Hunal Tomb at Copán (Bell et al. 2004).

While we have no written evidence of dynasty at Yaxuná, and indeed believe that no such evidence is ever likely to be forthcoming because the northern divine kingship appears to have been non-dynastic until the advent of the Ek' Balam dynasty in the ninth century, it is clear from our tombs that continuity in the tradition of kingship was important, however that continuity was attained (Freidel et al. 2013). The context of Burial 24 shows the extraordinary lengths that royalty went to in showing continuity through sacrifice and rebirth.

SACRIFICE AND ROYAL SUBSTITUTION IN A *TABLEAU MACABRE*

People could enter the Burial 23 tomb chamber through a trapdoor in the broad terrace surface above the five-doorway masonry-vaulted building fronting the structure. Recall that the upper plaza of the coeval phase of Str. 6F-3 also had a trapdoor entry into the subsurface corridors and subsurface chamber used for royal rituals there. In this manner the tomb chamber was similarly designed for royal accession rituals like Str. 6F-3, but in this case the human performers would remain deceased and apotheosize as divinities accompanying the new conqueror king. The terraces on top of the vaulted palace of Str. 6F-4 were accessible by a narrow stairway on the northern side of the building. The tableau performance arranged with bundled and unbundled bodies inside the tomb defined and commemorated the ritual and mythic framework of the sacrifice and succession events for which the overall building was evidently designed. This intention by the successor ruler to reference the whole new building can be inferred from the symbolic connections between the tomb tableau and the coeval cached offerings inside the open summit platform. As we have argued above, Burial 24 most probably marks the end of the city's dynastic rule in the Early Classic (Ambrosino et al. 2001; Stanton et al. 2010; Suhler et al. 2004). Archaeologists of the Selz Foundation Yaxuná Project have interpreted this as a termination of a local ruling family carried out by the conquering outsiders who wished to continue the tradition of divine kingship in the city. Its chronological range (late Yaxuná II) falls into Tikal's Manik IIIa construction period, which materializes in Teotihuacanoid ceramics among the offerings. Burial 24 is a complex ritual deposit in the tradition of Teotihuacan's Early Classic dedicatory offerings in the Pyramid of the Moon (Sugiyama et al. 2014; Sugiyama and López Luján 2007). It contains an array of human interments arranged in and around a large number of artifacts referencing divine authority, deities, and other supernatural beings. The new archaeothanatological analyses of this deposit significantly advance and clarify the reading of this context to discern the performance intended by its makers.

The chamber for Burial 24 was integral to the design of the terraces above the five-doorway palace below and the open-summited platform above. The chamber had probably been set up to emphasize the principal deceased ruler in a similar fashion as Burial 23, especially considering its dimensions and orientation (plate 7.7a). However, if we take a look at the stratigraphically and taphonomically reconstructed depositional sequence (plate 7.7b, 7.8, and 7.9; table 7.1), it is evident that the tableau represented the ruler's resurrection in the person of his executioner and that he and his entourage symbolized the new meaning of this sacred mountain pyramid. Appropriately, the first bundle on the floor of the tomb chamber was the sacrificed ruler placed at the southern end. He was most likely a mature male who had been half-burned in a fleshed state somewhere outside the tomb (plate 7.8). We infer this progression since the chamber itself did not show marks of the sort and volume of burning required to consume an adult body in place over several hours. The bundle was filled with cremation slag, charred strips of soft tissue, bone scraps, and ashes. The extremities did not show signs of heat exposure, making a case for incomplete combustion and subsequent bundling of this middle-aged male, prior to being tied and placed within the womb of the mountain. The skull, the base of which is banded and charred, was separated from the rest of the scorched remains and placed on a plate together with other offerings at one side of the cremains.

We identify Burial 24-14 as the principal performer and ruler because his bundle was directly associated with a distinctive Early Classic form of royal crown (plate 7.10) composed of polished and pierced segments of white *Strombus* shell (plate 7.10a) accompanied

TABLE 7.1. Chronological range and burial characteristics assigned to the two royal burials from Yaxuná, as discussed in this chapter and updated from Stanton et al. (2010). The list of individuals of Burial 24 is organized according to the inferred depositional sequence. Containers (EXE) are separately listed from the main occupants (MAIN).

TOMB #	PHASE	ARRANGEMENT	POSITION	DECUB.	ORIENT.	ARTICUL.	ANTHROPOGENIC MARKS
B. 23 (FUN)	Yaxuná IIa (AD 250–400)	Central	Extended	Dorsal	S	Primary	No
B. 24-14 (MAIN)	Yaxuná IIb (AD 400–500)	Southern Triad (M)	Bundle?	?	?	Secondary	No Data
B. 24-7 (MAIN)	Yaxuná IIb (AD 400–500)	Southern Triad (M)	Tied?	Seated	N-S	Primary	Unhealed Hemorrhage
B. 24-10 (MAIN)	Yaxuná IIb (AD 400–500)	Northern Triad (F)	Tied?	Seated	SE-NW	Primary	No Data
B. 24-11 (MAIN)	Yaxuná IIb (AD 400–500)	Southern Triad (M)	Tied?	Seated	SE-NW	Primary	Unhealed Chopmarks
B. 24-5 (MAIN)	Yaxuná IIb (AD 400–500)	Northern Triad (F)	Tied?	Seated	SW-NE	Primary	Unhealed Chopmark?
B. 24-6 (MAIN)	Yaxuná IIb (AD 400–500)	Northern Triad (F)	Tied?	Seated	S-N	Primary	Possibly
B. 24-13 (?)	Yaxuná IIb (AD 400–500)	On top of B. 24-14	?	?	?	Secondary?	Smoked?
B. 24-2/12 (EXE)	Yaxuná IIb (AD 400–500)	None	Extended	Dorsal	S-N	Primary	No Data
B. 24-3 (EXE)	Yaxuná IIb (AD 400–500)	None	Irregular	Ventral	SW-NE	Primary	No Data
B. 24-4 (EXE)	Yaxuná IIb (AD 400–500)	None	Irregular	Lateral	SE-NW	Primary	No Data
B. 24-1 (EXE)	Yaxuná IIb (AD 400–500)	None	Irregular	Lateral	W-E	Primary	No Data

by a single jade diadem jewel (plate 7.10b). We discovered three shell segments of this crown together, all badly burned, as was the jade diadem jewel, concentrated in the bundle zone. Segmented headband crowns are rarely depicted on Early Classic jade portraits of rulers, as in the case of one illustrated in the exhibition Lords of Creation (Fields and Reents-Budet 2005:121, figure 25) and probably from the southern lowlands. The color white is pervasively associated with the Classic royal headband. The bioanthropologist who excavated Burial 24, Sharon Bennett (Stanton et al. 2010), reported discovering a second shell headband of this sort in situ on the skull of Individual 24-6. The photographic record of this discovery has been lost, so this observation must be taken as provisional, but it was corroborated by Charles Suhler, who was the field director during the excavation and who incorporated this observation into his doctoral dissertation on the North Acropolis of Yaxuná (Suhler 1996; see also Ardren 2002; Stanton et al. 2010; Suhler and Freidel 1998).

Further corroboration for the importance of this distinctive shell band can be seen in the context of Early Classic (AD 378) PNT 019 at Tikal (Laporte and Fialko 1990, 1995), identified by the Guatemalan project as the tomb of a ruler and probably King Chak Tok Ich'aak I (figure 7.8). The published illustration of the context shows a band of four polished and carved segments of white shell pierced for sewing onto cloth or leather adjacent to the skull of the deceased. The location of the shell band suggests that it had been placed around the neck of the individual as a necklace along with a real necklace of four tubular jades carved in the mat symbol of royalty. However, the star-shaped ear flares of this ruler were placed to either side of the head, suggesting that these shell insignia were arranged in proximity to the head rather than on it at the time of interment.

The jade diadem jewel in Burial 24 depicts a profile quetzal bird. Quetzals inhabit the cloud forests of the Guatemalan piedmont, and the feathers of this bird were highly prized by the Maya at all times. This bird, *k'uk'* in Mayan, was incorporated into the royal name of the famous early fifth century AD king K'inich Yax K'uk' Mo' of Copán, Honduras (r. AD 425–436), and he was later depicted with Quetzal features on his headdress. Royal name diadem jewels are known from the Maya Classic record. On Tikal Stela 31 King Sihyaj Chan K'awiil II (ca. AD 411–456) holds a crown ornamented with a diadem jewel depicting an owl pierced by an *atlatl* javelin, Spearthrower Owl, his grandfather's name. King K'inich Bahlam II of El Perú-Waka' (r. AD 657–711) had himself portrayed with his name diadem jewel on El Perú-Waka' stelae 1, 33, and 35. King Yuknoom Yich'aak K'ahk' (r. AD 686–697) was interred in Calakmul Tomb 4 with a fiery claw as a diadem on his elaborate headdress (García-Moreno 2003:figure 4), confirming that the deceased was indeed him and not his illustrious father Yuknoom Ch'een II. So the use of a personal diadem jewel by the ruler interred in Yaxuná Burial 24 is part of a broad pattern in Maya royal practice.

The skull of this king was discovered in a plate adjacent to the bundled cremains, evidently intentionally placed there. Also in the plate was a pair of star-shaped ear flares like those discovered in PNT 019 (plate 7.11a). Other artifacts included a bone stylus, a polishing or grinding stone, and lumps of black and green material suitable for painting. The most significant symbolism in this plate is painted on its inner surface (plate 7.11b). The scene shows

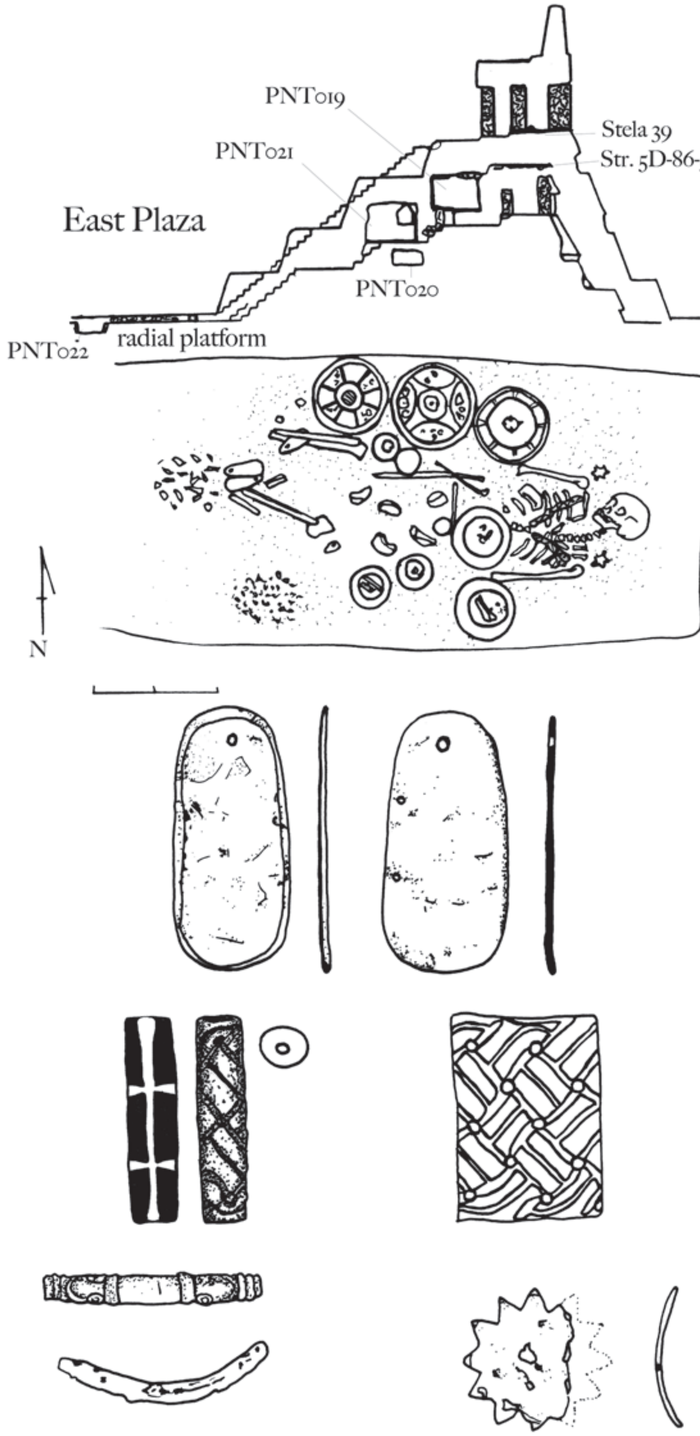


FIGURE 7.8. PNT Burial 019, context and associated artifacts (from Laporte and Fialko 1995).

a lord dressed in a full Scarlet Macaw suit embellished with multiple tails of the kind worn by Teotihuacano lords in this period (e.g., Yaxuná Stela 1, Tikal Stela 31). This costume is a clear example of what Karl Taube (2009) has identified as the Avian Maize God. In his cogent interpretation, this image represents the incorporation of the attributes of the Solar Scarlet Macaw deity known as the Principal Bird Deity by the Maize God following defeat and sacrifice of that bird. By the Late Classic period this idea has evolved into the Holmul Dancer version of the Maize God, wearing a back rack decorated with Quetzal plumes. Taube affirms the association of Quetzal plumes with growing maize, symbol of the resurrected Maize God. The lord on the plate in Burial 24 is carrying a turtle carapace, which is both a drum and also a symbol of the earth out of which the Maize God resurrects. The association of this painted sacrifice and resurrection performance with the skull of the postulated king in Burial 24 suggests that the lord depicted on the plate is the conqueror and executioner in the performance. It situates the sacrifice of this king and his entourage, and the advent of the new king, in mythical narrative time and causality. It is also relevant that the red feathers of the Scarlet Macaw symbolize fire.

In light of the reality, detailed below, that Burial 24-14 was just the first of an assembly of bundled and unbundled individuals concentrated in this tomb chamber, it is highly likely that his death was sacrificial, and it is logical to explore the prospect that he was killed with fire. The condition of his cremains show that his body was only partially burned and that in particular the extremities were not burned. It is significant that his partially burned body was bundled and placed in the tomb chamber. Vera Tiesler and her colleagues (Chinchilla Mazariegos et al. 2015) have recently reported on a sacrificial cremation offering at Tikal that also dates to the Early Classic period and has affiliations with Tikal in the era of the Teotihuacan alliance—indeed it is on the centerline axis of the Lost World Pyramid Group, a solar commemorative E-Group, directly west of Str. 5D-86, the building holding PNT 019 discussed above. In the case of PNT 7TT-01, the cremains of the victims were also only partially burned while fleshed (Chinchilla Mazariegos et al. 2015:93), and then the pit fire was finally extinguished with earth. Chinchilla Mazariegos and his colleagues make an interesting case for this double sacrifice by fire being related to myths about the Maize God, the Hero Twins, and solar and lunar deities.

A case can also be made for Burial 24-14 as a victim of sacrifice by fire related to myth and ritual. Karl Taube (1988), in a seminal article on scaffold and fire sacrifice in ancient Mesoamerica, proposes that a Contact period rain and agriculture ritual called *tup k'ak'*, 'put out fire,' has clear iconographic Classic period antecedents (figure 7.9). In the *tup k'ak'* wild animals were captured, had their heart sacrificed, were placed on a pyre and partially cremated, and then the fire was extinguished with water. Taube shows that a variant of this ritual also described by Landa had clear martial connotations and likely involved human sacrifice of victims captured in war. He proceeds to show how a human victim adorned as a deer is depicted in Classic Maya art tied to a scaffold and burned to death. A variation on this form of fire sacrifice has the victim with opened chest splayed across a container holding bundles of firewood at the base of an accession scaffold. These scenes are particularly represented in stelae

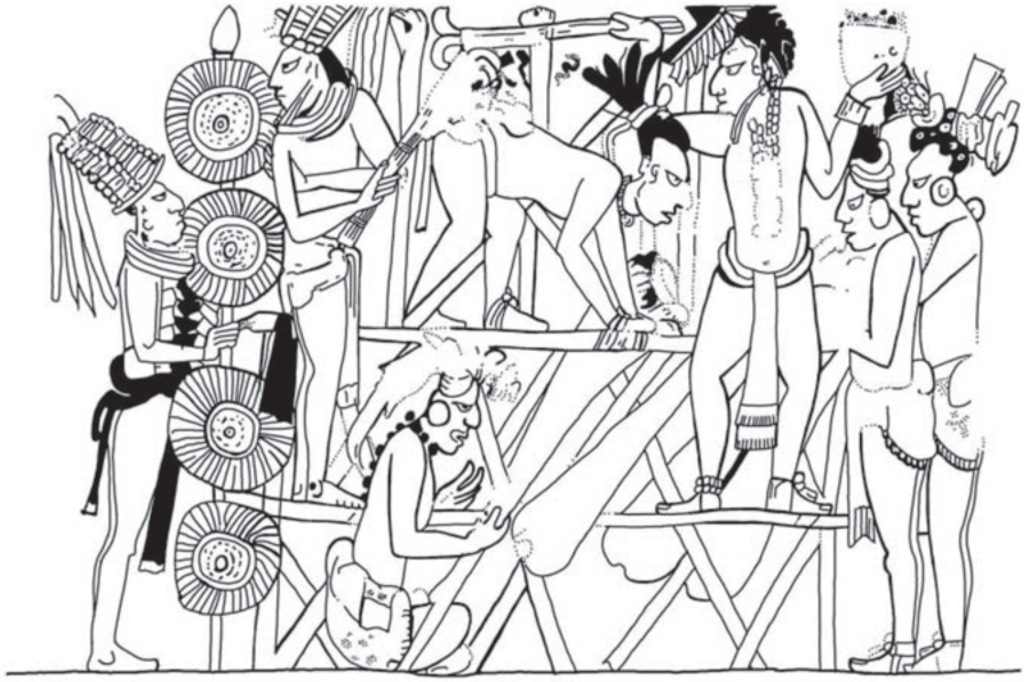


FIGURE 7.9. Scaffold immolation sacrifice of a captive performing as a deer (Mayavase corpus, K2781, drawing by Alexander Tokovinine after a rollout photograph by Justin Kerr).

at the site of Piedras Negras. In both of these kinds of fire sacrifice, the extremities are less exposed to the fire than the torso, commensurate with the body of the ruler in Burial 24. Further, the burning on the skull of this individual would compare with the positioning of the victim in scaffold sacrifice if lashed into a quadrupedal pose. Finally, it would be fair to deduce that the partial burning of the body, the strips of flesh included in the bundle, would point to the prospect that the fire was extinguished before the process of cremation was completed. Chinchilla Mazariegos and his colleagues (2015) conclude that the cremation sacrifice at Tikal involved putting out the fire with dirt and stones. The fire burning Burial 24-14 may have been put out with water, and then the sacred remains of this sacrificed king bundled and interred at the southern apex of the tomb chamber. Why the apex of the tableau is in the south, when in general that direction is down, not up, in Maya cosmology, will become clearer as the contextual analysis proceeds.

The theme in these rituals reviewed by Taube and possibly represented at Yaxuná is renewal, either of the agrarian landscape in the period between the planting of the fields and the coming of the rains, or between one ruler and another. While we can never be certain of such contextual interpretations in the absence of historical glyphic commentary or iconographic depiction, they are commensurate with other evidence from the tableau in Burial 24.

It is worth attempting to place such extraordinary complex ritual deposits into narrative mythic and ritual context as done by Chinchilla Mazariegos and colleagues in the case from Tikal. We surmise that the intention of the ritual was to celebrate the transition from one government and ruler to another and perhaps also to insist that this transition would bring beneficent rains and prosperity to the city. We have other evidence relevant to this notion described below. In light of the complex arrangement in close space, it can be asserted that the ritual specialists who arranged the bodies in Burial 24 had some such significant ritual and mythic frame of reference in mind.

The archaeothanatological analysis here described by Vera Tiesler and Andrea Cucina effectively replaces all prior efforts to understand Burial 24 and forms the basis of the contextual symbolic analysis to follow. Therefore, we begin with that analysis and then consider possibilities of interpretation. After the initial placement of the bundled cremains of the ruler, ten more individuals from his entourage were arranged in the cramped space of the stone chamber. We could distinguish two concentrations: one orderly placed southern assemblage and a second one of cast-in corpses, including that of a pregnant woman still holding a baby in her womb. None of the bodies showed any clear evidence of prolonged fire exposure. Although we cannot prove that all the bodies were placed in one single event, there are strong indications favoring a scenario of a hasty mass burial. First, at least half of the corpses (the haphazardly disposed northern concentration) shared the decomposition process, as is suggested by the final disposition of their articulated skeletons. This indicates that they were deposited in a fleshed state in one single event. Second, toward the center and the southern section of the chamber, most bodies have an orderly posture and appear to have been tied tightly together in a seated position although not properly wrapped in blankets. Therefore, the decomposing corpses would have soon fallen over, the disarticulated heads falling and rolling together with their first vertebras still attached to the skull base. Note that all the individuals in the southern half are males, while the group in the northern sector of Tomb 24 is composed of females, youngsters, and children, apparently dumped directly from the entry hole on the ground. Third, a pair of centrally accommodated bodies, which were laid sitting back to back, bore fresh hemorrhagic, possibly traumatic, lesions (plate 7.12). Two additional bodies exhibited marks of perimortem violence in the form of blows to the chest, limbs, and the head. Taken together, the data confirm a scenario of violence and collective death rather than a gradual succession of revered ancestral kin.

Building on the observation that is likely that the deceased interred in Burial 24 were all victims of sacrifice, we infer that the arrangement of males in the south end of the chamber versus females in the north end was deliberate and part of the tableau. At this juncture it is important to focus on one of the females formally seated in the west central part of the tomb, Burial 24-6, a robust young woman in her twenties who was, according to Sharon Bennett, interred with a royal headband on her head (figure 7.10a). As previously mentioned, we cannot confirm this observation from the photographic record. Burial 24-6 was further associated with ceramic containers, including a gutter-spouted cup and pedestaled cup that we previously associated in our discussion of Burial 23 with the preparation of potions for

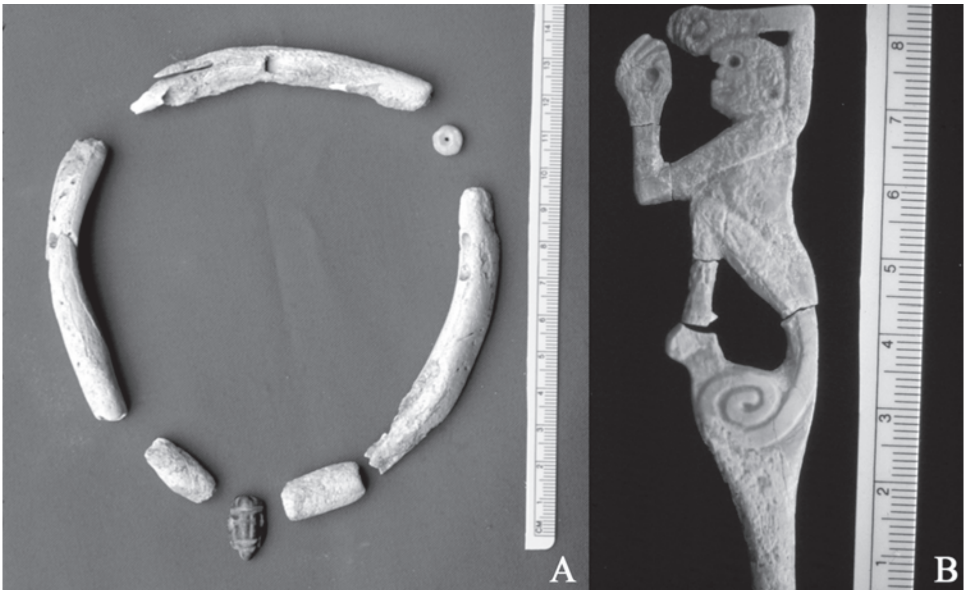


FIGURE 7.10. (a) Shell segments and jade diadem jewel from the royal headband associated with Burial 24-6; (b) carved bone stylus in the image of the Flea-Headed Monkey spirit (photo by Yaxuná Project, Selz Foundation).

ecstatic vision states. We also found another deer bone tube here of the kind that may have served as the syringe of an enema clyster. Relevant to this theme of visions, a carved bone stylus in a bowl next to this woman depicts (figure 7.10b) a distinctive spirit companion, *way* being, identified by Grube and Nahm (1994) as the flea-headed spider monkey. While we think that such ornate bone pins likely functioned as styluses for writing on wax, they certainly were insignia of literate and numerate elite worn as hairpins. The flea-headed monkey is depicted on tomb offerings discovered at Dzibanché, the Early Classic capital of Kaanul, and there is a painted scene of *way* spirits in which this spider monkey carries the Chihchan, Snake Deer way of the Kaanul rulers.

In the original analysis of the deposit this woman was cradling a unique ceramic effigy of a Teotihuacan-inspired goddess figurine (see Ardren 2002), painted in the canons of the Dos Arroyos ceramic group, that we now identify as the Moon Goddess (plate 7.13a). In the new and more accurate interpretation she was bundled or tied up in a fleshed state adjacent to this image, and as her body decomposed she slumped toward the figure. This analysis calls into question the possibility that the shell crown was still on her head when discovered, but in the last analysis the point is moot—the royal crown was next to this woman if not on her head. This crown has a variant of the trefoil jade diadem typical of Maya royal crowns (Freidel and Suhler 1995). The figurine is unequivocally a local ceramic artist's effort to create an image of a Teotihuacan deity, a pubescent goddess like the female effigies found in several complex ritual deposits in the Pyramid of the Moon excavations at Teotihuacan (Sugiyama and López

Luján 2007). Indeed, it is quite possible that the same artist created the goddess effigy and the Scarlet Macaw plate discussed above, as the color palette is the same.

This unique ceramic figure was certainly made by a master ceramic artisan of the Maya world being instructed by Teotihuacanos. The image shows a stylistically Teotihuacan pubescent female with a stepped mountain motif painted across her face. She has a black scroll painted on her right arm, the "lazy S" motif (plate 7.13b) that from Middle Formative times signified rain clouds into the time of the Classic Maya and later (Reilly 1995). This "lazy S" symbol, *muyal* in Mayan, is painted or tattooed onto images of the Classic Maya Moon Goddess as seen, for example, on K559 (plate 7.14a) where the goddess is giving birth to the rabbit she often carries on her lap. In another Classic scene K4022 (plate 7.14b) a god paints the Moon Goddess, who wears the scroll on her arm and holds the shell paint pot, as a *muyal* scroll cloud embraces both. Janet Berlo (1992), following Taube (1983), proposed that the Pyramid of the Moon was dedicated to a great goddess who was depicted on the Tepantitla Mural as an effigy mountain being composed of a fire censer sprouting entwined trees, the goggle eyes and fangs of the Storm God with water pouring from an upturned crescent basin representing her womb, and fire and rain coming off her hands. Within the mountain analogy, the womb waters represented the springs at the base of Cerro Gordo, while the trees grew on its extinct volcano summit. Susan Milbrath (1996) further explained that this upturned basin represented the crescent moon at the season of the returning rains, a Classic prelude to the Postclassic Aztec goddess Yacamitzli.

The face paint on the Burial 24 figurine depicts a stepped motif found on mural images at Teotihuacan, and in general this motif represents a mountain in Mesoamerica. The Pyramid of the Moon is an effigy of Cerro Gordo directly to the north of it, and a greenstone adolescent female figure from the complex deposit designated Burial 2 in the pyramid wears a stepped headdress, which could also represent a mountain. Nawa Sugiyama (2014), the excavator of Burial 2, identifies this figurine, along with a monumental sculpture discovered in the plaza of the Moon Pyramid, as a female deity associated with water. He suggests this in the context of a hypothesis that the Moon Pyramid is associated with a Teotihuacan Measurement Unit (TMU) of 105, the number of days when the sun moves northward between April 29th and August 12th, which symbolizes the rainy season.

Sugiyama in the same paper suggests that the Sun Pyramid is associated in terms of TMUs with the other half of the year that represents the dry season. He builds on this urban design to show that the Sun Pyramid is associated with fire rituals as evinced in sculptured elements of bundles of firewood and the presence of a massive monumental fire censer on the summit. Fash and colleagues (2009) have also identified the Sun Pyramid as a *wite' naah* Fire Shrine and a place for new fire rituals. Sugiyama goes on to suggest that the direction north in this primordial cosmogram is associated with the rainy season, the feminine divine and water, while the direction south is associated with the dry season, the male divine, fire, and heat.

There are several reasons to posit that the arrangement of individuals in Burial 24 might reflect the Teotihuacan cosmogram described by Sugiyama. In the south there is the fire intrinsic to the cremains of Burial 24-14, the solar and fire connotations of the Scarlet Macaw

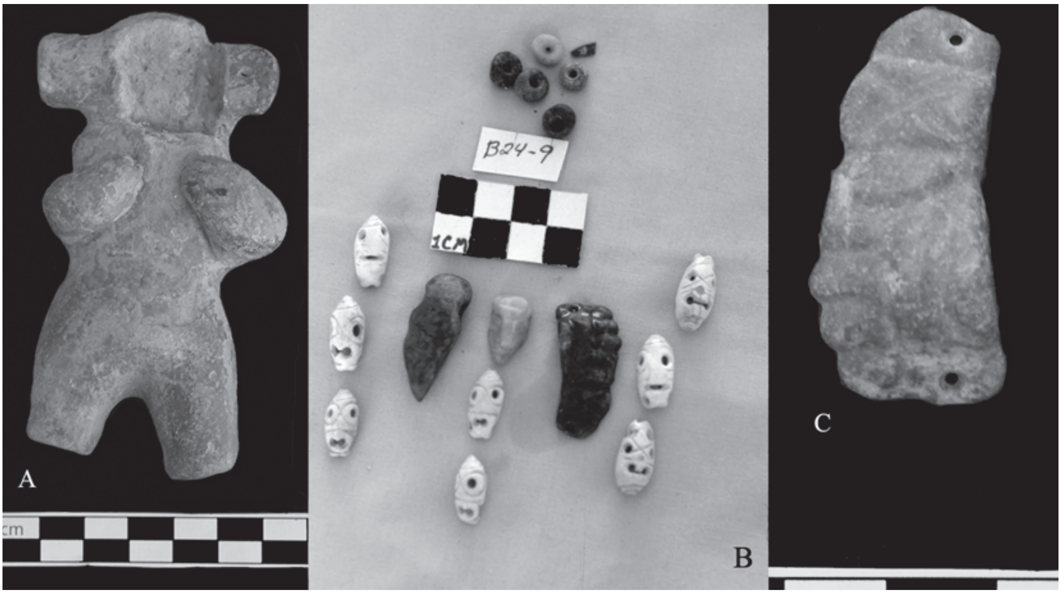


FIGURE 7.11. (a) Unfired clay figurine painted red and with tab rabbit ears; (b) pectoral of olive shell skulls and three royal jewels; (c) the profile head of the Old God of Sacrifice (photo by Yaxuná Project, Selz Foundation).

impersonator, and the aggregation of males. To the north of this pattern, beginning in the center, there is a royal woman who is associated with a Teotihuacan-style Moon Goddess figurine. This individual is also associated with a shell pectoral, a reference to water and the sea. The aggregation of females in the north continues with a mature woman to the north of Burial 24-6 who was associated with pierced pieces of coral, possibly part of a headdress and another reference to water. This woman also had a figurine (figure 7.11a), but this one was of unfired clay painted red. This unique figurine has peculiar rectangular ears. We posit that these represent rabbit ears, which are often depicted as lying flat against the side of the head in Maya art. While this is just a supposition, it makes sense in light of the identification of Burial 24-6 with the Moon Goddess. The elder goddess in the K559 scene is Chak Chel, the old midwife goddess in Maya myth. There she is bringing the rabbit up to the breast of the Moon Goddess.

The theme of fecundity referenced in the two women with figurines is continued in the case of Burial 24-2, a supine pregnant young woman on the eastern side of the chamber in a line with individual Burial 24-6 and flanking two seated men in the middle of the chamber. This woman had an elaborate pectoral composed of white olive shells carved as skulls with three jade jewels arranged in a line inside this cluster of shells (figures 7.11b and 7.11c). The Jade Hearth of Creation (Taube 1998) is here referenced against white shells that could represent the Milky Way. That hearth is associated with rebirth and resurrection. Alternatively, these three jades could represent the "in-line triad" of circles that surmount the upturned crescent in the girdle of the Teotihuacan goddess on the Tepantitla mural. In this way the jades might reference the Moon Goddess depicted in the figurine. The individual jades include another trefoil royal diadem jewel, a very worn dancing "Charlie Chaplin" figure associated with the conjuring of vision serpents, and a profile head with a St. Andrew's crossed-bands in the headdress (figure 7.11c) that could be a variant of the Old God of sacrifice and divination with his headdress of cross-shaped badges of shells briefly mentioned in the section on Burial 23. Certainly the royal diadem identifies this woman with royal status.

The flanking of two seated males by two females signaling fertility and fecundity suggests that the tableau here is a resurrection scene. There are several painted scenes of resurrection in which the Maize God (or a ruler impersonating him) rises out of a turtle shell and is greeted by two nude fertile and fecund young women. In this reading of context, the seated men between the women would represent the Hero Twin sons of the Maize God (who are also featured in this pageant), while the cremains and Scarlet Macaw performer in the plate scene would represent the sacrificed and resurrected Maize God himself. The piling of women and children at the north end of the chamber would mark the end of the formal arrangement and underscore the relationship of the north with women, as suggested in the cosmogram. Finally, a plain, flat rectangular stone was placed between the two seated men and the bundle of cremains. This artifact is of a size and shape that Freidel and his colleagues (2017) identify as a palette used for divination or, coated with wax, for writing. It could mark the inscribing of this ritual and tableau onto the history of Yaxuná.

Two cached offerings dedicating the open summit platform of the rebuilt Str. 6F-4 are relevant to the themes described in the Burial 24 tableau. Cache 2 consisted of a black-painted jar with an animate sculptured black axe head jammed down into it (figures 7.12a and 7.12b).

Within the "chopped" jar were royal jewels, collar beads, ear flares, hair binders, and diadem jewels. It clearly registered the "axing" of the sacrificed king in Burial 24. On top of the array of diadem jewels that likely belonged to this king (figure 7.12c) was an owl diadem jewel with the symbol for shiny on its back. The owl was the pervasive symbol of the Teotihuacan presence in the Maya lowlands in this era, and a major image of war in art at Teotihuacan. Cache 3, set to the east of Cache 2, was a red painted jar with a large pink shell bead buried below it, a *Spondylus* plaque inside it accompanying a finely carved diadem jewel (figure 7.12d) depicting a person with the head tab and scrolls of the Tonsured Maize God. This unique jade appears to be a portrait and not a generic face, and it strongly resembles the face of the Scarlet Macaw Maize God performer in Burial 24. It is possible that this jewel represents the successor to the sacrificed king.

Revealing in this case is the apparent absence of ritual tomb impregnation or protracted cycling, although we noted intense smoking around the entrance void. Indeed, Str. 6F-4 could have served as a Wite' Naah Fire Shrine of the New Order era (AD 378–520), as the "doll" in Burial 24 as a Teotihuacan-inspired effigy of the young Moon Goddess suggests, and because the tomb contains evidence of the psychedelic potion practice that is associated with the Feathered Serpent, a deity also part of the Wite' Naah Fire Shrine cult.

FIGURE 7.12. (a) Cache 2 vessel with axe jammed into it; (b) the animate axe in Cache 2; (c) the Royal Jewels in Cache 2, including a Late Preclassic "Bib" monkey skull, an Early Classic bibbed Maize God, and the Teotihuacano Owl diadem, upper left corner; (d) diadem portrait jewel from Cache 3 showing the conqueror as the Maize God (photo by Yaxuná Project, Selz Foundation).

FINAL COMMENTARIES

In this chapter we have revisited the first two scientifically documented royal tombs from the northern lowlands in light of updated forensic and archaeothanatological methods and skeletal analysis by the UADY bioarchaeology team. This study corrects and adds to our knowledge of these still rare burial contexts from the Early Classic. Burial 23 represents a foreign-born very early member of dynastic leadership. Past his death and primary sepulcher, the remains of this ruler were eventually revisited and terminated ritually to provide cycling and continuity for his subsidiaries. Different from Burial 23, there is substantial evidence that the dignitaries allocated together with several containers inside Burial 24 concluded the local dynastic line. On that occasion, a first burnt body was accommodated together with the unexposed-to-fire corpses of the royal family, accompanied by several containers; most probably all had been sacrificed, their fleshed bodies covering up the royal remains in the mortuary mausoleum at a time when Yaxuná was to lose its role as a dynastic player in the lowland regional networks.

What has strengthened this interpretation is our conviction that the bodies and artifacts were deliberately arranged in both tombs to evince an eternal performance by the spirits of those people (Freidel and Suhler 1998; Suhler and Freidel 1998). This is not a new or novel idea regarding the arrangement of Maya people and things in tombs and graves. It was clearly articulated by Michael Coe (1988), reviewed comprehensively by James Fitzsimmons (2009) for royal contexts, compellingly illustrated by Stephen Houston and Andrew Scherer and his colleagues as a society-wide Classic Maya mortuary principle (Houston et al. 2015; Scherer 2015; Scherer et al. 2014) working at El Kinal in the Usumacinta River region, and discussed by Traci Ardren (2015) as a transformation of social identity with regard to child burials in the northern lowlands, including burials at Yaxuná. It is the working premise of deliberate arrangement that demands the most of forensic and contextual analysis. Our record is not perfect, particularly with regard to the complex deposit of Burial 24; but we can attempt to make useful sense of the information, as we understand it. And yes, already during the Early Classic, semi-divine kings were venerated high up in the northern lowlands, as we have made the case for Yaxuná's royal burials.

8

FEEDING THE GODS IN YAXUNÁ

Sacrifice and Human Caches

INTRODUCTION

ANCIENT MAYA mortuary assemblages are usually the end results of procuring practices for the dead that are followed by centuries of decay. Most ancient burials materialize ancestral traditions enacted by surviving kin and express shared ideas about death and afterlife coupled with the mourning for a deceased loved one (Duday 2009; Parker Pearson 1999). This may not be the case, however, during times of contingency and crisis. Mortuary treatments also tend to be acted out differently after the ritual immolation of humans. Thinking of the Maya, human sacrifice (or animal sacrifice for that sake) has long been recognized both in the ancient iconography and the archaeological record. Ritual killings tended to be followed by depositional conducts that usually stand scores apart from any of the reverential conducts that we know from the area during pre-Hispanic times (Duncan 2005; Tiesler 2007).

Given the complexity in meanings and conducts that are expressed in both types of human assemblages in the Maya area, their scrutiny allows for extraordinary discussions of mortuary behavior as such and of individual and social conceptions regarding death and afterlife and, therefore, ancient society. Only combined reconstructions and regional comparison of single and collective mortuary conducts that enable broader discussions on the meanings of the long-standing yet shifting ritual traditions in the Maya demonstrated that they were not an exception to other societies.

In this chapter, we document select human assemblages in and around Yaxuná that do not seem to be formally reverential but rather ritually (*sensu* sacrificially) motivated and that have been termed "nonfunerary" in other work (Tiesler 2007). Albeit case studies of repositories for the remains, these glimpses hold promise for a broader understanding of the choreographies of ritual immolations of humans in the Yucatán Peninsula—namely, those of what once were likely ritually slaughtered victims and their posthumous processing in the form of cremation, reduction, and relic taking (tables 8.1 and 8.2). Note that the nonfunerary

TABLE 8.1. Perimortem and postmortem anthropogenic marks in human remains, as discussed in the text.

ACTION	ABBR.	SKELETAL SIGNATURE
Slicing	CS	Thin and mostly superficial slicing marks on bone surfaces
Sharp Force Trauma	CE	Deep cut-marks on bone surfaces
Bone Section	SE	Sectioning of bone by abrasion or sharp instruments
Polish	PU	Wearing off and flattening of bone surface by abrading with soft or hard material
Indirect Fire Exposure	BA	Reddish coloration (< 300C)
Low Fire Exposure (300–500 °C)	NE	Charring (black tone)
Intermediate Fire Exposure (500–600 °C)	GR	Light brown or gray tone (500–600C)
High Fire Exposure (>600 °C)	AZ, BL	White, blue tones
Heating of Green Bone	WA	Transverse, convex, and conical fissures (*warping*)
Heating of Green Bone	ESTR	Stratigraphy of colors (*sandwiching*)

TABLE 8.2. Chronological ranges assigned to the sacrificial deposits at Yaxuná, discussed in this chapter and updated from Stanton et al. (2010).

BURIAL NUMBER	PHASE	GRAVE ARCHITECTURE	POSITION	DECUBITUS	ORIENTED	ARTICU-LATION	NUMBER OF INDIVIDUALS
Burial 22	Yaxuná III (AD 500–700)	Simple Pit	?	?	N	Primary	1
Burial 26 (Skull)	Yaxuná III (AD 500–700)	Simple Pit	Extended	Dorsal	N	Primary	1
Burial 27 (2011) (27-1)	Yaxuná III (AD 500–700)	Simple Pit	Flexed	Ventral	N	Primary	1
Burial 27 (Cr. 1, 2011) (27-2)	Yaxuná III (AD 500–700)	Simple Pit	—	—	—	Secondary	1

repositories discussed here complement our documentation those from the two tomb chamber contexts, already described in chapter 7.

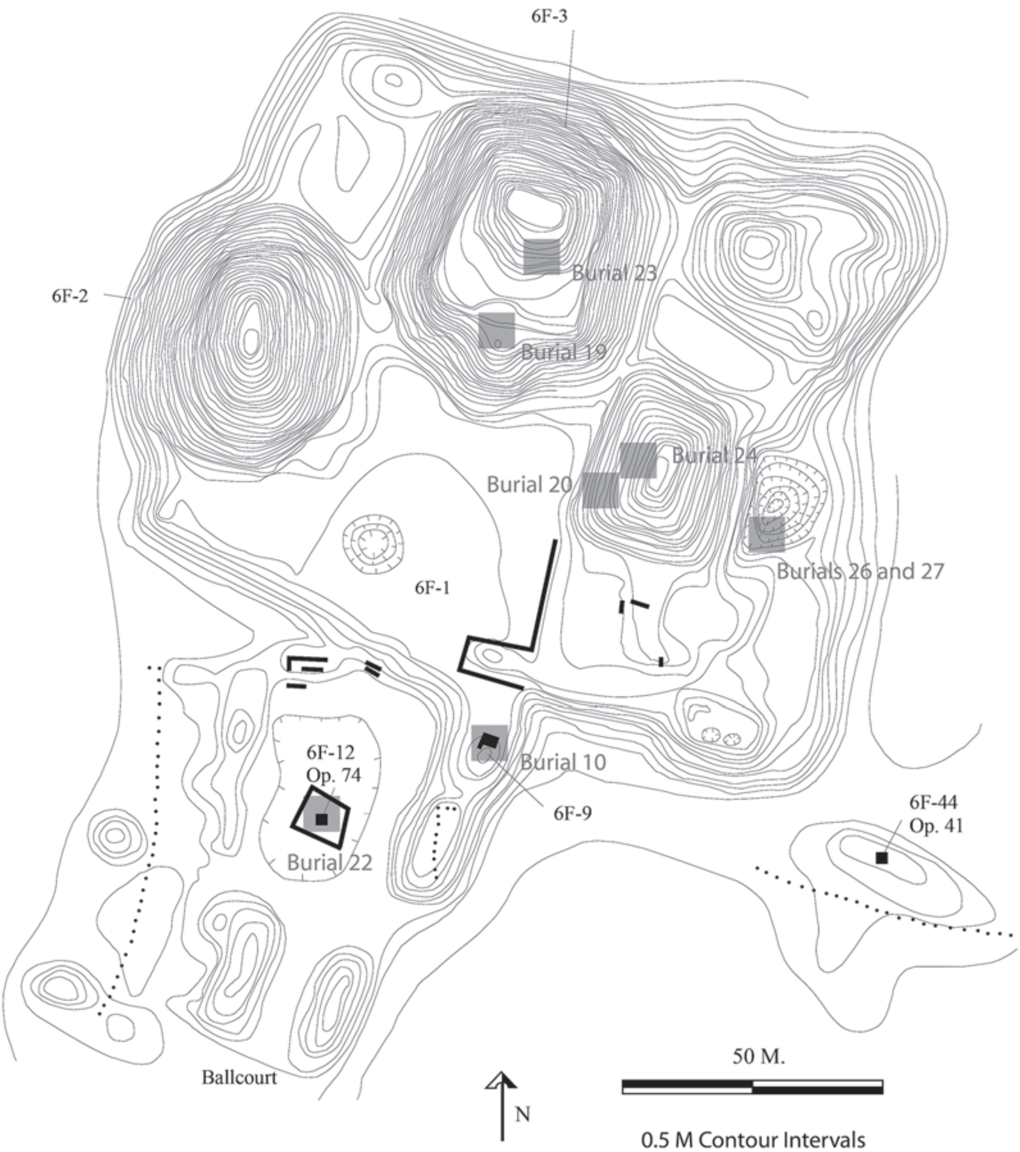
The subsequent paragraphs will follow up on the general depositional trends according to chronological assignments of clearly nonfunerary deposits and those who have a potentially ritual character, using the project classification, which bridges the Early Classic tomb burials described in chapter 7 with the diverse Late and Terminal Classic deposits. For the purposes of this study, we have scrutinized the burial profiles and analyzed all surfaces of our local skeletal collection systematically for anthropogenic marks, inflicted ante-, peri-, or postmortem, following Pijoan Aguadé and Mansilla (1997), Schmidt and Symes (2008), Turner and Turner (1999), and White (1992) (table 8.1). These attributes include sharp and blunt force trauma, slicing and sectioning, different types of bone breakage, and heat exposure. The state of preservation and completeness of each skeletal individual was determined according to anatomical segment and overall presence. In a second approach, we documented isolated human segments and commingled remains, which are prominently represented in a rock-shelter associated with the North Acropolis.

CONSUMPTION OF BODIES BY RITUAL FIRE

The first human assemblage from Yaxuná under discussion, Burial 22 from Str. 6F-12 (figure 8.1a), is a complete cremation of a single individual that was deposited at the bottom of a round, delineated pit, measuring 1.20 m in diameter in the center of a low square platform located in the plaza just to the south of the North Acropolis. In fact, this structure is located on the axis of an open plaza connecting the North Acropolis and the ballcourt. Because of its peculiar location in the center of an open space and its morphology, this context had been originally described as a sweatbath by Dave Johnstone, the excavator (Stanton et al. 2010; figure 8.1b). However, more recent scrutiny has pointed against this interpretation given the lack of material evidence to characterize this assemblage as such. The platform and the ballcourt date to Yaxuná IVa.

The Yaxuná context has parallels in a small number of other sites across the Maya lowlands, where cremains have been found in low platforms located in the central areas of plazas. Such is the case of a double cremation from the Plaza of the Seven Temples, several single cremains from Tikal (Chinchilla Mazariegos et al. 2015; see also Coggins 1975, 1979; figure 8.2), and one completely scorched multiple from the Central Acropolis of Caracol (A. F. Chase and D. Z. Chase 2011). In these cases, the bodies had been burned on pyres in a fleshed state above a pit excavated for this purpose in a ritually significant, liminal location. After the act, the cremated remains were then left on the spot and the pit was filled in. These contexts are similar in that they align with triadic groups (principally E-Group complexes) and that they are situated right in the core of monumental districts.

In the case of Yaxuná, the badly weathered and burnt remains belonged to a young man who had barely reached maturity.[1] The taphonomic signature from his skeleton is a showcase



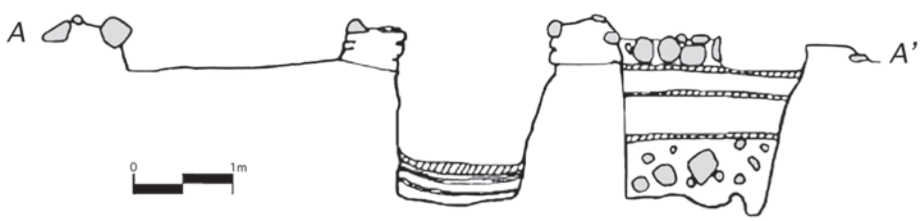


FIGURE 8.1. (a) Location of Burial and sacrificial deposits around the North Acropolis at Yaxuná; (b) East-West section of Burial 22, Yaxuná, showing the stucco lined pit on the left (Yaxuná Project, Selz Foundation).

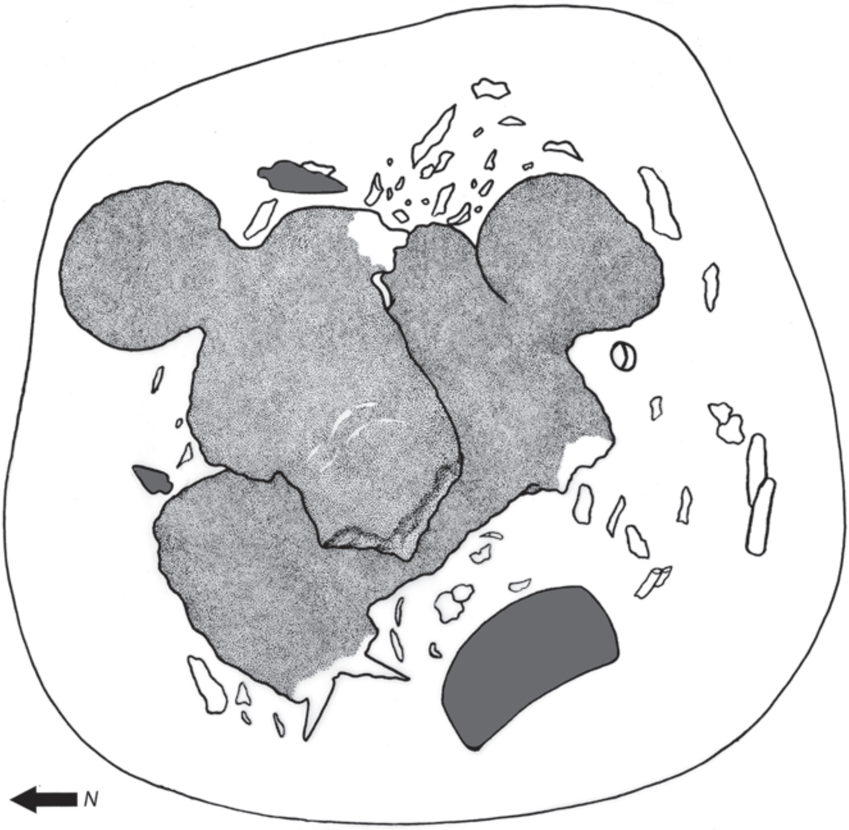


FIGURE 8.2. Similarly sized, still partially articulated double cremation burial from Early Classic Tikal from the center of the Plaza of the Seven Temples and east of its E-group (PP7TT, IDAEH, Parque Tikal, Guatemala).

for fleshed cremation at a high temperature (above 500° C) (plate 8.1).[2] In preparation for the bonfire, the walls of the prepared pit in the platform had most likely been covered loosely with *sascab* and the pit filled with combustible matter (Stanton et al. 2010; Tiesler 2016; Tiesler et al. 2015). The dimensions of the pit deposit, together with the presence of a massive volume of charcoal, ashes, and cremation slag, suggest that the body was burned at high temperatures in this pit until it was reduced to disarticulated bone scraps and ashes before the pit was filled in again and sealed with a subsequent floor (figure 8.1b).

The deposit looks suspiciously like the sacrificial remains of a calendrical ritual. Any conclusive identification of the ritual occasion with *katun'* or New Year renovation ceremonies, however, remains elusive due to a lack of more compelling evidence in this specific case and the fact that many rulers utilized ideologically charged dates to reinforce their claims to authority. Regardless, the axial location in the center of an open court, and the fact that a body was consumed completely on a pyre without proper reburial, does recall the firing techniques and inferred ritual choreographies discussed in other bioarchaeological works for Tikal and Caracol and links the Yaxuná case to a larger tradition on a wider regional scale.[3]

Further, scenes that are reminiscent of the body treatment that may have led to Burial 22 are depicted in a number of sacrificial scaffold scenes painted on Maya polychromes or carved into stone monuments (Taube 1988). Particularly grisly to our eyes is one scene carved into Tikal's Altar 9. On the top of the scene, flames collapse over the overextended body of a still living captive while he is suspended from the top with cordage. This and additional analogous scenes hint at the utilization of scaffolds in firing human bodies and could have been used also in the cremation of the individual from Burial 22 at Yaxuná. Beyond doubt, these were major festive occasions, their performance pertaining to the religious and political elites of kingdoms. In these ritual choreographies, cremation deaths were important elements, as they evoked central cosmogonic myths of the Maya that were triggered by fire transformation (Tiesler 2017a).

In terms of fiery body consumption, Yucatán is not an exception, although the broader regional imagery depicts not so much the burning bodies on scaffolds but shows the victims draped over burners (Graña-Behrens and Tiesler 2017; Tiesler 2017a). Late and Terminal Classic monumental sculpture in particular display such evocative sacrificial scenes. For instance, such imagery has been noted from the Building of the Sculpted Columns at Xculoc as well as from Tohcok in Campeche (figure 8.3). The latter shows a sacrificial ceremony that had been painted on a doorjamb from the site's epicenter and is dated to the Late or Terminal Classic (Graña-Behrens 2002). This scene shows a dancing priest in jaguar attire bearing solar markings, while a child is being offered on a spiked censer. Smoke rises behind the *ajaw* sign and two wooden bundles, while the youngster is consumed by flames and smoke, pointing toward calendrical consecration. Another example comes from the Puuc site Techoh, near Oxkutzcab, and has been described only spuriously in the literature, probably also due to its severe weathering. In this case, the spiked censer is depicted on a columnar altar dated to the Late or Terminal Classic. It carries what we believe is a child with flames emerging from its top (Graña-Behrens and Tiesler 2017; see also García Campillo 1995; Riese and Mayer 1987).

This type of ceremony must have continued past the collapse, as a burning ritual reminiscent of the above scenes appears on the so-called Tenoned Disc from Chichén Itzá. This round carved stone was recovered directly from the Caracol architectural complex. In this case, either a clay figure or a real body is dropped directly into a burning brazier, possibly as part of a scattering ceremony (Graña-Behrens and Tiesler 2017). The inscription refers to the title *ajaw* and provides a specific date of AD 930.

BODY BUNDLES IN YAXUNÁ'S SACRED SPACES

The ancient Maya believed in sacred spaces and held them to be thresholds that would catalyze communication and exchange with otherworldly powers. Subterranean passages were

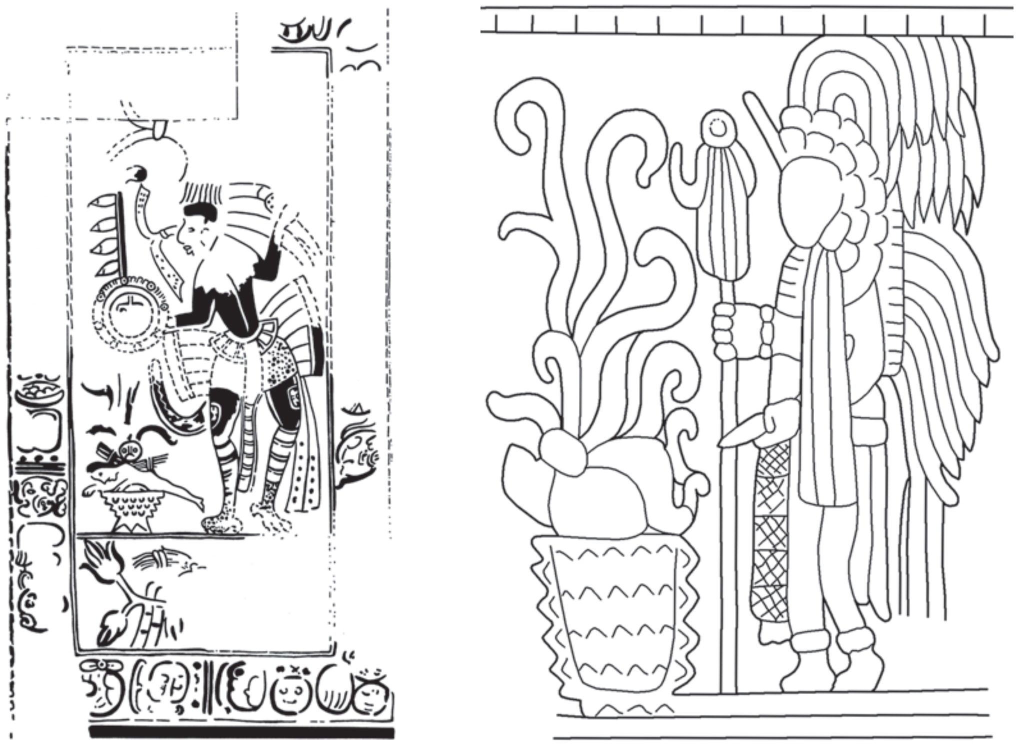


FIGURE 8.3. (a) Painting on inner side of doorslab, Tohcoc, Campeche (Graña-Behrens 2002). Note that smoke rises behind the ajaw sign and two wooden bundles (from Proskouriakoff 1965:figure 13.b); (b) spiked censer, displayed on a columnar altar from Techoh, Yucatán, displaying the burning of a body while priest stands by (on exhibit in the Regional Museum of Dzibilchaltún, INAH; drawing by B. Ceballos).

considered such a liminal space between the living and the dead and were therefore used as ritual depositories for the divine, including human disposal. From this perspective, the exploration and interpretation of human remains from natural geological cavities provide invaluable points of departure to understand Maya cosmology, ritual, and sacrifice. Due to the complexities involved in their interpretation, controversy has dominated the discussions about the origins of human cave deposits ever since Ruz's landmark survey of Maya mortuary customs (1991; see also Ruz Lhuillier 1965). The unusual and sporadic mortuary use of caves and crevices has been emphasized, along with their diverse and in some ways distinctive roles from most residential repositories. Recent scholarship (e.g., Cucina et al. 2015; Lucero and Gibbs 2007; Saul et al. 2005; Scott and Brady 2005; Wrobel et al. 2014) has emphasized the need to treat centrally located, urban cave burials as conceptually distinctive from those embedded in the inaccessible rural landscapes. The former are more readily attributable to centrally conducted sacrificial and postsacrificial discard, given their proximity to the seats of dynastic power (Cucina and Tiesler 2014; Palomo 2007).

This interpretive lens is particularly relevant in the case of a collapsed cave associated with the North Acropolis. This area, now only a rock-shelter, had been used as a ritual repository for over a thousand years (Marengo Camacho 2013; Stanton and Marengo Camacho 2014). Recent excavations by PIPCY have revealed that a large depression documented on a basal platform of the North Acropolis resulted after the collapse of a cave, over and around which the North Acropolis had been constructed during the Formative period. Sometime during the Early Classic, this cave began to collapse and the depression was used as a trash pit, containing copious amounts of ceramic, lithic, malacological, faunal, and human remains.

In 2011, excavations of the area still protected by the rock-shelter led to the discovery of the intact skeletal remains of what had been introduced as a bundled body. It appeared in a homogeneous sandy layer some 210 cm below the collapsed roof just to the north and 120 cm above the bottom of the cave deposit. During initial explorations, only the articulated lower legs with their feet were exposed, the elements closest to the surface. Yet upon further exposure by the UADY team, it became apparent that these bones were only part of a complete, tightly flexed skeleton, which in life had belonged to a young adult male. The extraordinary state of preservation in which we found the bones was probably due to the lack of vegetation and the dense, regular, and dry quality of the embedding soil protected by the overhang (figures 8.4 and 8.5).

This unique mortuary assemblage had been interred in the midst of an extensive matrix of broken ceramics, faunal remains, and burnt and broken human bones, although no proper grave goods were made out to have accompanied the individual in death. Small segments pertaining to Burial 27 itself, such as a rib fragment, carpal bones, and phalanges, laid interspersed with other trash remains in the larger context. In all cases the dispersed fragments of trash encroached on the burial, indicating frequent disturbances of the soil accruing on top of this primary deposit; most likely such disturbances were due to subsequent human activity during the course of the following centuries. Yet the skeleton remained very well articulated, suggesting that there was an intentional avoidance of the context and that there was a collective memory of the burial (plates 8.2 and 8.3). In spatial proximity to Burial 27 was an isolated skull of one other individual, which will be described in the subsequent section of this chapter. As we believe from the contextual and ceramic associations, this burial dates to the Late Classic period.

Burial 27 is quite unusual in its form. The individual had been squeezed prone into a reduced rectangular hollow. This pit should have measured not more than 40 cm on its north-south axis and only 70 cm in its perpendicular direction. The original excavation of this mortuary context must have been accomplished in such a way that the back of the corpse closed the deposit horizontally tightly on top, making a sort of geometric, rectangular outline, which we still recognized clearly in the skeletonized body arrangement. This "boxed" human cache was laid out on an east-west axis, with the buttocks to the east and the neck facing west, while the face itself "looked" upward from below the left second or third rib.

All skeletal segments, except for the above-mentioned peripheral and upper parts (such as the left rib cage), showed to be tightly articulated, signaling instant filling of the body's

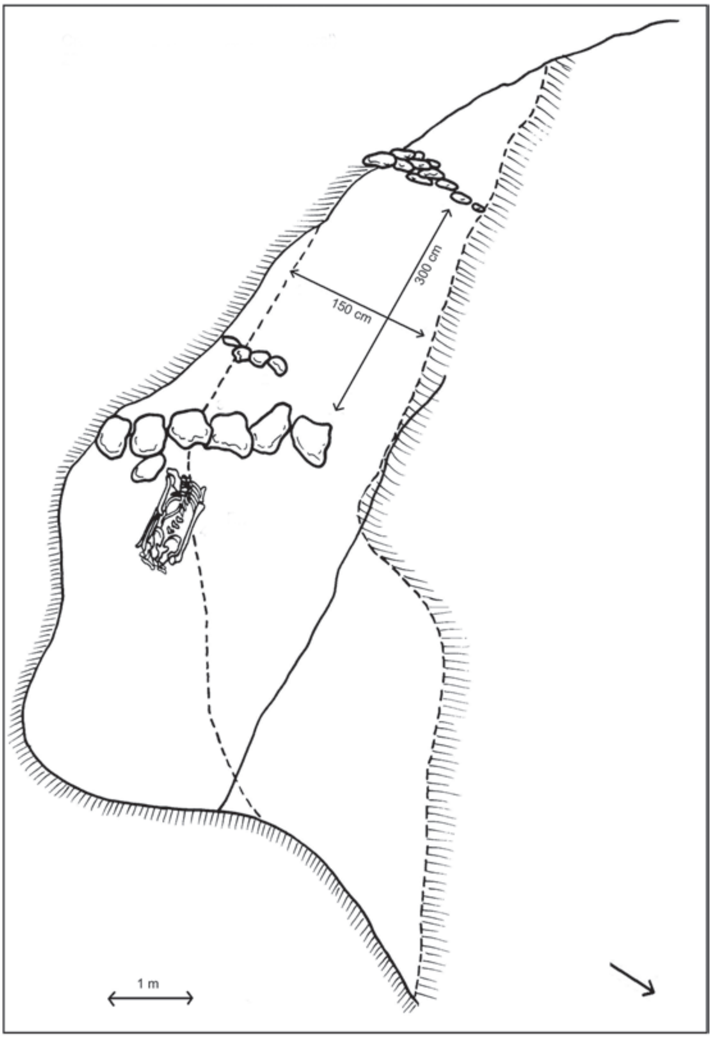


FIGURE 8.4. Ritual rock-shelter to the east of Yaxuná's North Acropolis, with Burial 27-1 (4), skull deposit 27-2, and stone alignments within the volume of shrine (2, 3) (Yaxuná Project, PIPCY).

decompositional volume with soil, which would gradually percolate and substitute the voids formerly occupied by the soft tissues (plates 8.2 and 8.3, and figure 8.6). During the decompositional process the skeletonizing trunk sank down, resulting in the shoulders resting beneath the level of the feet. On the other side of the rectangular pit, the remains did not suffer any change in position due to their lack of bland parts. These data suggest that the pit's depth should have measured originally some 10 cm less here than at the proximal end.

The tibial shins came to rest directly on the bottom of the pit with both feet rotated medially. This way, the distal part of the left foot came to rest on top of the distal portion of the right

FIGURE 8.5. Rock-shelter on the North Acropolis (PIPCY; photo by V. Tiesler).

one. The arms had been crossed in front of the abdomen, the legs completely flexed toward the sides of the trunk (plates 8.2 and 8.3, figure 8.6). The trunk itself had rotated slightly toward the right, probably as a result of the volumetric displacement caused by the head on the left side, still in a fleshed state. Revealingly, it was the neck and not the head that touched the edge of the pit. The head itself had been lowered beneath the left shoulder and pulled down to force it into the chest cavity beneath the second or third left rib. After a thousand years of being in earth, upon excavation, the face of the young man seemed to "look" up to us unnaturally from beneath the left scapula. His orbits touched the shoulder blades from beneath. Note that this forceful throat extension and head twist does not appear to have caused any fracture in any cervical vertebra, but was associated at least with green-bone fractures in at least one left thoracic vertebral apophysis and two rib necks, as we shall discuss below (figure 8.7).[4] The thoracic girdle deserves separate attention in our taphonomic discussion. Only the right ribs were articulated with their corresponding vertebral necks, whereas the left rib cage showed disturbances and disarticulation from the fifth segment downward—namely, the fifth rib showed complete disturbance, just like the sixth, the seventh, and the eighth ribs. The seventh segment displayed complete rotation out of its expected space of articulation with the vertebral column. Only the lowest left ribs showed to articulate with the vertebral spine again.

With this taphonomic scenario, we can hypothetically reconstruct the following sequence in primary deposition. It seems that the young occupant of the tight rectangular

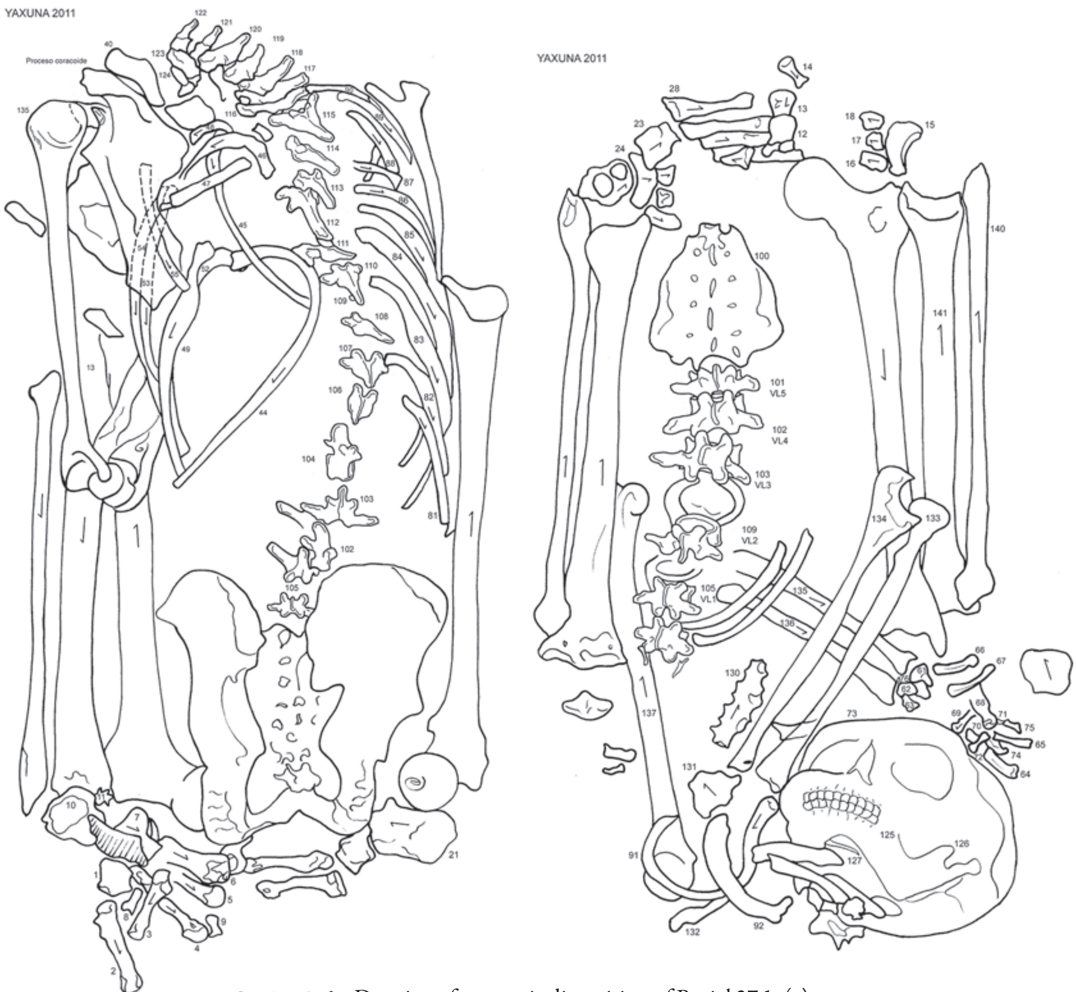


FIGURE 8.6. Drawing of anatomic disposition of Burial 27-1: (a) upper layer and (b) lower layer (PIPCY; drawing by M. Sánchez).

mortuary repository had been accommodated, tied, and flexed, with the head on the chest. The state of articulation argues against any use of sturdy matting or cloth for bundling the corpse (which would have caused disruption in the filling in of voids and therefore resulted in a less articulated distribution of skeletal segments).

The information from the field was supplemented by the lab analysis, furthering our understanding of these remains. The individual was confirmed as male, using current macroscopic indications as described in chapters 2 and 3. The age range was 20 to 22 at the time of death, with some few epiphyses still open or in the process of closure. No visible signs of antemortem (and therefore healed) trauma were noted, except for a deviated nasal root. Regarding infectious disease, the remains display evidence for chronic, ongoing systemic disorders caused by infectious disease. This condition led to numerous large lithic resorptions inside the thoracic and lumbar vertebral bodies with nodular inflammatory remodeling

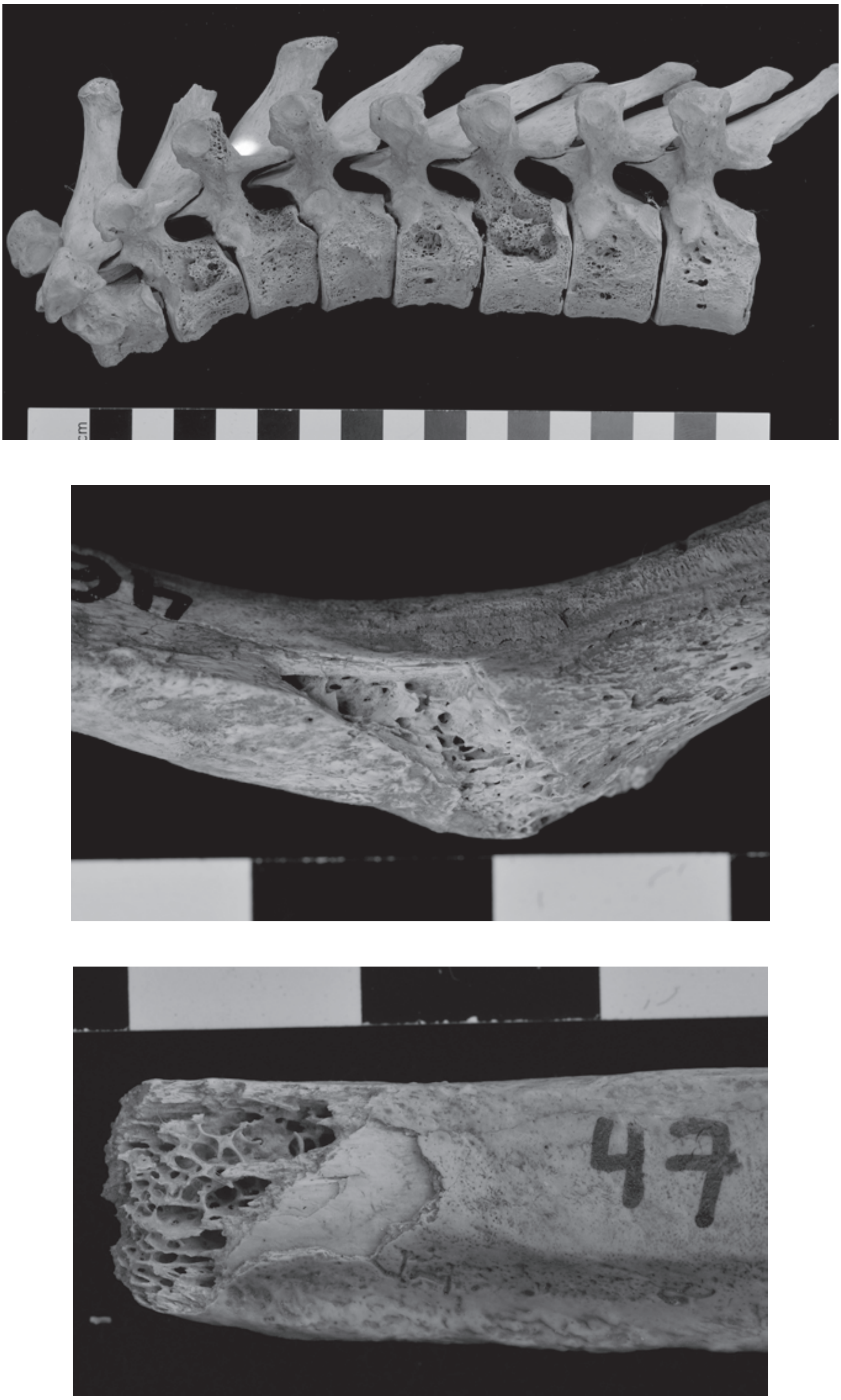


FIGURE 8.7. (a) Middle and lower thoracic vertebras of Burial 27-1, showing extensive, chronic, although localized lithic resorption on most vertebral bodies; (b) left rib of Burial 27-1, which displays unhealed tear of rib neck; (c) sharp-force trauma in green bone on body (PIPCY/Bioarchaeology and Histology Laboratory, UADY).

along the pleural surfaces of the ribs, with hemorrhagic components in the corresponding rib necks (figure 8.7). While the pathologies should have caused incipient spinal deformation, the disease should have caused chronic discomfort and supurative reaction in the individual when still alive, particularly in the airways. Considered jointly in terms of morphology and anatomical topography, the changes manifest an ongoing infectious, inflammatory reaction, which the literature identifies with specific osteomielitis, probably related to endemic and advanced brucelosis, and less so, equinococo, tuberculosis, or micosis (Aufderheide and Rodríguez-Martín 1998; Ortner 2003). This rare condition has been documented in various reverential burials and specifically sacrificial assemblages across the peninsula, such as two primary deposits from Champotón and Becán (Tiesler 2007).

The skeletal remains of Burial 27 were systematically scrutinized for peri- and postmortem marks. Several ribs showed perimortem trauma in the form of laceration, spiral fractures, and sharp force trauma in green bone (figure 8.8). The latter mark damaged the fourth left rib, which displays a blow from the front to the neck of the rib. The cortical edges are straight and regular, while the dorsal spongy and cortical volume shows a rougher surface, indicating that the stab wound was inflicted from the front and hit the back of the spine. The tonality is not lighter that the bone surface, which indicates that the condition is not recent, just as the orientation and direction of the fissure seem to indicate. Likewise, the eighth left rib shows evidence of at least two lacerations at the height of the rib neck and the midshaft area. Also these marks were inflicted in a fresh, probably fleshed state. The tension fracture was probably caused by a vehement outward torsion of the segment.

When we take into account the taphonomy reconstructed for Burial 27 (we recall especially the loss of articulation in the left rib cage), the documented rib lesions appear to signal the violent opening of this part of the thoracic cage, perhaps for sacrificial heart extraction, probably followed posthumously by the forceful introduction of the head (still attached to the neck) into the hollow. It is noteworthy in this respect that we did not encounter any rib segments between the face and the left scapular surface. Regardless, this mortuary treatment is the first one of its kind described for the area. The tied and packaged character of the individual certainly evokes hunting rituals, involving white-tailed deer and wild fauna in the Maya area and beyond, as we have described in chapter 4 of this volume.

Although the current evidence would render any more definite assertions for this specific individual speculative, scholarship on Mesoamerican religiosity (see, for example, Olivier 2015) goes at lengths to assign hunting rituals with deeper meaning of feeding the gods by offering faunal essences or segments in the form of aromas, clouds, or in a raw, rather than boiled or cooked, state. In the metaphorical and reciprocal native cosmology, these ceremonies could include humans. It is significant to recall that, for this liminal deposit and the ceremony that surely preceded it, a terminally diseased young man would be chosen, one who suffered from a rare "cold" and "watery disease" of what brucellosis would have represented in proper native conception. This brings to mind a further, similarly aged male from the large settlement of Becán, further south in Campeche (Tiesler and Campaña 2006). Like Burial 27-1, this youngster had suffered from this rare chronic infection before being killed by heart extraction and being bundled and left on the lower staircase of a buried substructure.

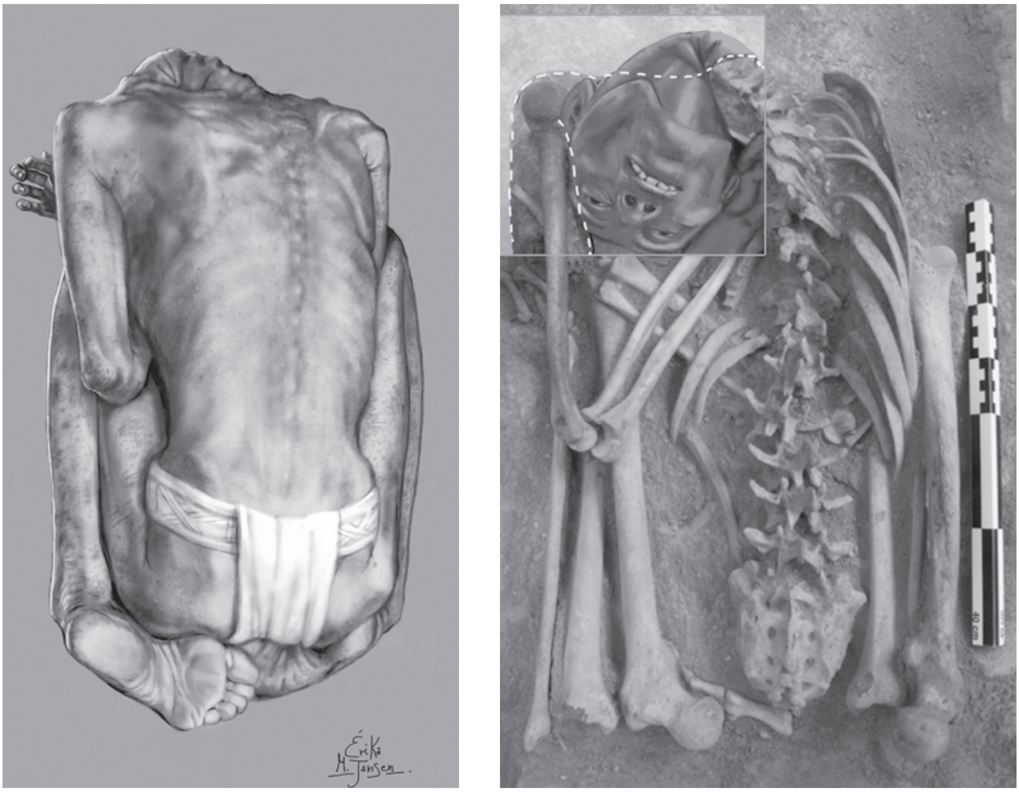


FIGURE 8.8. Anatomic reconstruction drawing of the burial disposition of B27-1, showing (a) tight flexion of lower extremities and a displaced left rib cage; (b) close-up reconstruction drawing of lower layer. The overextended and sharply twisted neck of the individual, with head "looking" upward through the displaced thorax (PIPCY; drawings by Érika Meijide Jansen). The body is shown emaciated from terminal chronic brucellosis; the skin of the legs is rendered spotty due to diffuse hemorrhages.

RITUAL DEPOSITS OF BODY PARTS AT YAXUNÁ

Apart from the intact individual labeled Burial 27-1, a massive amount of large and well-preserved ceramic sherds and bony vestiges was deposited in the subterranean passage beneath Yaxuná's North Acropolis. Many isolated human bones were among the material deposits recovered in the volume of the cave fill. Albeit some were well preserved, the majority showed a highly weathered and fragmented quality. Some of the bones displayed clear signs of direct burning. The diverse taphonomic nature of these segments (including two skulls and a mandible) indicates that most remains had undergone diverse and in part extensive posthumous treatments even before they entered the trash deposit. Numbered according to sector and layer, these bone scraps included teeth (Sector 2.1-no. 1), adult phalanges (Sector 3.1-no. 2, 3; Sector 3.4-no. 13), mandibles (Sector 3.3-no. 7), fire-exposed skulls (Sector 3.3-no. 8; Sector 3.4-no. 9, 14; Sector 3.5-no. 14; see also next section), ribs (Sector 3.4-no. 11, 13), and humeri (Sector 3.4-no. 10). The complete crania exhibited cut-marks around the occipital and the frontal area. Despite the unusual position and placement of Burial 27 (being the only complete individual in the deposit and in conjunction with the postmortem treatment of the other human remains), the burned and broken bones encountered in this context may reflect the mortuary treatment of people from Yaxuná who were not interred in formal crypts and tombs and suggests that this trash pit may have been the final resting place for people killed during institutionalized violence and specifically during religious enactment. The joint evidence suggests that the depression was used as a deposit of ceremonial trash during the latter portion of the Classic (Marengo Camacho 2013, Stanton and Marengo Camacho 2014; Tiesler et al. 2012). In the following section we will specifically refer to two intact cranial deposits, along with an additional one interred right outside the overhang (table 8.2).

BURIAL 27-2

The skull was found at a depth of one meter, within Level 2, where it was found leaning against the inner wall of the rock-shelter, facing east (figure 8.9). Two meters separated this deposit from Burial 27-1. Material and stratigraphic associations indicate a Late Classic chronology for the well-preserved cranial deposit. The skull lacked a mandible and vertebras, suggesting it had been carried inside already in a skeletonized state. The piece itself lacked its left zygomatic arch and ten mostly frontal maxillary teeth, all of which are held in the socket by conic roots; this feature makes it very easy for the teeth to fall out of their socket in dry bone and get lost. All the above suggests handling, maybe transportation prior to its final deposition, perhaps as part of relic taking or protracted postsacrificial treatment.

We documented several other human bone scraps in the immediacies of this skull. However, none of those appears to belong to this individual. The state of preservation and tone of what was labeled subsequently Deposit 27-Cr. 1 was exceptionally good just like the preservation of Burial 27. Whitish spots intercalated with a shiny, light-brownish bone surface, potentially pointing to prior boiling, although this point cannot be assured with certainty. Lab scrutiny identified these remains as belonging to an adolescent of 13 to 17 years of age who was likely female in life (see description in chapters 3 and 5). Some of the noticeable biographic features of this skull were the foreign origin of the individual (likely from central or western Petén, see analysis in chapters 2 and 5) and her extreme head elongation and reclination, aligning with the beauty ideal of Western Ch'olan populations during the first millennium AD.

Without the postcranium, we can only speculate about the living conditions of this youngster. However, severe, healed hyperostosis (as described in chapter 4) points to a deficient food intake or absorption during childhood in the form of vitamin C deficiency (possibly scurvy), which had a debilitating effect on the connective tissue and recurrent bleeding.

Regarding cultural, anthropogenic marks, we did not document any signs of perimortem violence, but scored a number of probably intentional slicings in the peripheral area of the orbits and crossing over the frontal crests of both sides, which make us believe that this individual could have been flayed prior to skeletalization. As stated above, we do not rule

FIGURE 8.9. Isolated skull deposit without mandible (B27-2) as found in situ (photo by PIPCY).

out boiling as a form of postmortem preparation, given the patches of discoloration and the peculiar shiny surface we observed. Taken together, the attributes of Burial 27-2 point to the preparation, curation, and final deposition into a liminal space of a foreign-born youngster with extreme physical attributes. We cannot assure her sacrificial status with the evidence at hand, but the combined signatures make this scenario quite probable (see Tiesler 2007).

BURIAL 26

Much less preserved than the skull Burial 27-2 was what the Selz Foundation termed Burial 26 in 1995. This single, deteriorated skull was recovered in the trash deposit just outside of the protected rock-shelter. Dated insecurely to Yaxuná's phase IVa–IVb (associated Cehpech/Sotuta ceramics) given its proximity to the disturbed surface of the deposit, this cranium belonged to an adult individual who was likely male, considering the degree of robusticity and size of the segments that integrated the skull without its mandible, just like the afore-described context. Prior to deposition, this piece had been exposed to low heat, leaving areas of superficial carbonization on two of its segments—namely, the ethmoid and the malar bones. The stratification of the color changes and the spotty distribution of the darkening seem to indicate an exposure in a fleshed state.

Apart from heat exposure, several slicing marks, performed by a repeated action of cutting with obsidian or chert tools, were noted. These cut-marks cross over the inial area of the occipital bone and were probably motivated by separating the nucal musculature from the still fleshed back of the head. Showing signs of heat exposure, it appears that the skull had been either separated from the trunk posthumously or by decapitation, to be subsequently burned, maybe as part of a censer ceremony held during a ceremonial occasion and as part of postsacrificial rites, as we have described along the opening pages of this chapter. Of course, we cannot, and do not, rule out alternative explanations tied to an ancestrally motivated choreography. However, the lack of offerings and the public location of the human context would speak against any reverential funerary practice.

A myriad of head interments or previously defleshed skull deposits have also been noted during explorations of other Maya settlement and specifically in peninsular assemblages (Andrews and Andrews 1980; Medina Martín and Sánchez Vargas 2007; Tiesler 2002; Weiss-Krejci 2006). They appear either in association with the articulated corpses (especially between plates) or were placed as seemingly isolated offerings in the monumental core area of cities. Many of the individuals to whom they once belonged appear to be foreigners, as acknowledged by their isotopic profiles (see for example Tiesler et al. 2010b).

CONCLUDING REMARKS

As this and the previous chapters of this section demonstrate, it is only this detailed level of reconstructions of mortuary pathways that sets the stage for a broader discussion on singular versus unified behavioral components or for inferring long-standing, culturally embedded, conservative trends versus social change and crisis. This holds especially true for ritual body processing involving human bodies. This chapter has explored the breadth of body treatments at the site following ritual killings or likely ritual slaughter. These appear to stand apart from the shifting local and regional ancestral practices in and around the site. As in other urban Maya centers, the case studies documented here highlight the use of sacred, liminal spaces or axial spots in central temple areas; posthumous body manipulation in the form of cremation, reduction, flaying, and relic taking was probably part of many ritual enactments that preceded the assemblage formations described here.

Also, social disruption is prone to be expressed in shifts or contingencies in burial practices, expressed in the material record by massive replacements or discontinuities in terms of mortuary repertoire. This has become clear after our discussion of the multiple Burial 24 assemblage. This simultaneous primary multiple was most probably a staged *tableau macrabre* of forced cycling of the terminated elite with their retainers. It is probably no coincidence that most of the truly "deviant" burials (as defined by Murphy 2008)—confirmed simultaneous multiples in the Maya record, irregular positioning, sealed deposits of charred bones, or fleshed mutilated bodies and segments—date to the liminal years of reoccupation, abandonment, war, and destruction during the centuries surrounding the political and social replacement at the end of key periods in the northern lowlands.

9
THE CYCLING OF AN ERA

Chichén Itzá and the Decline of Yaxuná

INTRODUCTION

As we have learned over the course of this book, Yaxuná's population has a long and complex trajectory, stretching back to the dawn of Maya civilization. In this chapter we shall sum up what the archaeological and especially the mortuary and human record of Yaxuná inform about the city's internal development and regional engagements before its final decline and demise. As with many cities across the lowlands (Culbert 1973; Demarest et al. 2004), Yaxuná experienced a drastic decline and eventual abandonment during the Terminal Classic Maya collapse. This abandonment, however, while intrinsically tied to regional social processes occurring across the cultural landscapes, shows a peculiar course of events given the settlement's day-walking distance (approximately 18 km) to Chichén Itzá, one of the most important and enigmatic urban centers in the later history of ancient Mesoamerica.

Beyond doubt, although originally triggered by the tumult generated among the large polities to the south of the peninsula, the close of the Classic period was also a time of great social turbulence in Yucatán and at Yaxuná. While the role of Chichén Itzá in the wider processes surrounding this upheaval is not well understood, it is clear that the rise of this city was directly related to the decline and eventual abandonment of Yaxuná. This chapter closes by discussing the bioarchaeology of the unprecedented forms of Maya urbanism and multiculturalism at the verge of the second millennium AD in the central northern lowlands.

FRAMING THE TRAJECTORY OF YAXUNÁ'S PEOPLE

We have a tremendous amount of data from Formative period Yaxuná (Stanton 2000, 2005a, 2012, n.d.a; Stanton and Ardren 2005; Stanton and Collins, n.d.a, n.d.b; Stanton et al. 2010; Suhler 1996; Suhler et al. 1998a). As discussed in more detail in chapter 1, it is the earliest known settlement in the region dating back to at least 900 BC. As the community grew over the first few centuries of occupation, a regional polity coalesced around it by the beginning of the first millennium AD. Yaxuná was a thriving regional capital whose architectural traditions were very much inside the canons of Petén. Unfortunately, we have absolutely no skeletal data from this early span of time, which in reality covers more than half of the chronology of pre-Hispanic Maya occupation of the region. Despite excavations in the types of public and monumental spaces where human remains have been recovered by other projects working on the Formative, such as the E-Group complex and various triadic acropolis groups (5E-19, North Acropolis, East Acropolis) as well as in numerous domestic platforms specifically dating to the Late Formative (see Stanton and Magnoni 2016; Stanton et al. 2010), no human remains have been recovered. Granted, many of the domestic platforms have been tremendously altered by later Classic period activity that may have destroyed the early human remains or moved them to secondary contexts that we have not yet been able to identify. However, the possibility remains that early human burial practices differed at Yaxuná and the dead were placed less often in these types of contexts. Only further research will shed more light on these possibilities.

Human remains have been recovered from Formative contexts in other areas of the northern lowlands (e.g., Hernández Hernández and Arias 2003). Such is the case of the large site of Dzibilchaltún, which had already emerged as an important settlement by the Middle Formative. It was extensively excavated during the second half of the last century by the Middle American Research Institute (MARI) (Andrews and Andrews 1980). The 27 Formative period burials from this site are associated mainly to its El Mirador group, and most of them are aligned along the east-west axis. Only one of these assemblages had been formally lined with stones as a tomb. The others were simple interments, some with inverted plates over the cranial area, others without. Infants were placed in ceramic vessels. In this sense the Formative period burial record from Dzibilchaltún anticipates the commoner funerary customs in the region in the centuries to come.

Tiesler (2010, 2014) has documented Formative period cranial modifications in the Dzibilchaltún material. One specimen, dated to the Xculul phase (50 BC–AD 250), displays a pear-shaped, Olmecoid cranial modification, a peculiar form identified with the Maya Maize God and first described by Arturo Romano in a Middle Formative site from Chiapas (Romano 1980; see also Taube 1996); this form has not been reported in Yucatán past the onset of the Classic period.

Recent excavations led by Fernando Robles at Caucel, in the western periphery of modern-day Mérida, has also revealed Formative period burial remains, among which two, once again, display a narrow and high cranial vault just as the example described above (Tiesler 2010). The simple burials are associated with Dzudzuquil Group ceramics, which ties them to the Early Nabanché phase (800/700–400/300 BC). The preliminary results from the work at Caucel indicate that this large settlement had ties to the north coast and was primarily occupied during the Middle Formative; occupation, however, continued through the Late Classic (Robles and Ligorred 2008; see also Andrews and Robles 2008). The fact that human remains have been found in Formative period contexts at these, and other, sites brings us back to our earlier thoughts on the missing burial population from Yaxuná's early occupation; the Dzibilchaltún and Caucel examples may provide feasible scenarios for burial traditions and head shapes for Yaxuná's early inhabitants, although this remains speculative at this time.

Just as early remains are uncommon in Yucatán and have been cursorily reported, representations of humans are also sparse in the northern Maya lowlands during this early time. Apart from the petroglyph of the image of a Late Formative ruler at the cave of Loltún (Freidel and Andrews, n.d.) and some possible cave rock art dating to the Formative at some other sites (e.g., Barrera and Peraza Lope 1999; Slater 2014a, although the dating of this art is far from secure), the only depictions of anthropomorphic figures come from large stucco deity mask programs (e.g., Quintal 1999; Quintal and Rodríguez 2006) or portable greenstone figures (e.g., Rathje et al. 1973) that do not give us much of an idea of either the social or biological skin of the early Maya of this region.

At Yaxuná itself we do not currently have much of any data along any of these lines (see Freidel and Suhler 1995) before the first evidence of human remains, represented by the dynast buried in the Burial 23 tomb chamber in the North Acropolis. As the Early Classic was ushered in, we begin to get a better, albeit still vague, sense of the people of Yaxuná themselves. A small amount of iconography is available from this period (Brainerd 1958; Suhler 1996), as well as the skeletonized remains of 13 individuals. Unfortunately, all of the documented skeletons come from two royal tombs and do not represent a cross-section of the site population at large. While we can possibly explain the lack of nonelite burials the same way we did for the Formative period (i.e., massive destruction of early residential structures through a processes of renovations during the Late and Terminal Classic and/or a local practice of disposing the dead that did not result in many bodies buried in residential architecture, the former being the most likely of the two possibilities in our opinion), finding evidence of settlement during the Early Classic has been a challenge (Stanton 2000). In fact, in contrast to Late Formative settlement that, despite being heavily disturbed, has been extensively identified throughout the site through a program of test pits and surface collections, few clearly Early Classic structures have been reported by the several projects that have worked at the site.

One explanation of this problem may lie with difficulties in the ceramic chronology of the site (see Johnstone 2001; Suhler et al. 1998b). The Early Classic has been traditionally identified at Yaxuná through the use of ceramic markers from the Xanabá and Dos Arroyos groups, as well Petén Gloss wares (see Johnstone 2001 for a breakdown of Yaxuná II into various phases). The problem with the Xanabá group is that, as Ceballos and Robles (2012) point out, Xanabá Red extends some distance back into the Formative period and, as Gómez García (2012) notes, the Flaky Ware tradition to which Xanabá pertains endures through the Late Classic. Thus, it is not a good chronological marker of the Early Classic. The Dos Arroyos polychromes, as well as the Petén Gloss wares, are good markers but are not found in sufficient amounts at the site to be tremendously useful for dating in settlement survey. Further complicating the matter, as A. F. Chase and D. Z. Chase (2005) point out, Formative ceramic types such as Sierra Red extend into the Early Classic, blurring the lines between these periods and making Early Classic settlement more difficult to identify. To add to this problem, our current work on the ceramic chronology, such as Maxcanú Buff, indicates that some ceramic types thought to pertain to the Late Classic also extend back into the Early Classic, a situation also noted at the site of Oxkintok, where Varela Torrecilla (1998) established a Middle Classic period. Thus, although there has been discussion of a reduction of population at Yaxuná as a consequence of a possible Formative demographic collapse (Glover and Stanton 2010), an event that has been proposed for other areas of the lowlands (see Ball 1978; Grube 1995; Hansen et al. 2002; Tourtellot 1988) and that we still believe the data support, there may be also a chronological issue here.

Our recent research on the settlement and its chronology, however, does not support the idea that the Early Classic period settlement cannot be distinguished well from other chronological periods. Radiocarbon essays in secure contexts from the 5E-50 Group and the identification of a number of large platforms with Early Classic components in the areas surrounding this group indicate that in the area just south of the E-Group complex stood a number of residences dating to this period. This may indicate that there was indeed a population decrease, possibly contributing to the lack of residential burials in our sample.

In any event, what we know about the Early Classic at Yaxuná comes from strictly high-status contexts. These, by themselves, are revealing in that they showcase the varied political uses of funerary ritual, during times of both stability and substitution, just as chapter 7 demonstrates. The accommodation of Burial 23 and its lavish accoutrement is rich in material and manufacture, but it held a highly symbolic value that we have tied to solar deities and the vitality of maize, to dynastic self-sacrifice and final ancestral apotheosis. As demonstrated, the bed of scorched hearth stones that were allocated around the skeletonized corpse of the paramount together with the ashes appear to generate a cosmic hearth. In its center rests the upper part of the deceased royal, creating a vertical axis with the universe above.

A human "cosmogram" of a different kind is projected by Burial 24, a simultaneous multiple coined *tableau macabre* by David Freidel. Its setup integrates a female and a male triad of tied and seated corpses, accompanied by several young human containers, tossed at one end of the tomb from the void above. As we have argued from the material evidence, the simultaneous placement of exquisitely attired corpses, some of which show marks of perimortem violence, argues for an abrupt end of rule (and indeed the ruling pedigree) and most probably a replacement by other contenders to maximum authority.

POLITICAL CHAOS AND REVITALIZATION DURING THE TERMINAL CLASSIC

Relatively soon after the murder of the royal family at Yaxuná during the Early Classic, the city entered an era when it is difficult to well understand what happens to its residents. We assume that some degree of control over the settlement by the perpetrators of this act lasted for a time, but it is not until the causeway that connects Yaxuná to the great Late Classic metropolis of Cobá sometime during the seventh century AD that we get a better sense of

Yaxuná's political history again. It is during this period of profound contact with Cobá that we finally have a series of burials that come from residential contexts, many of which can be considered nonelite and which have been described in chapter 6.

The period of the construction and initial use of Sacbé 1 (the causeway appears to have been reused during the Late Postclassic, possibly as a pilgrimage route [see Ardren 2003], although there is no evidence of use during the Terminal Classic) has been surrounded by polemical debate concerning what the construction of such a massive feature means regarding the relationship between these two cities at this time (Loya Gonzalez and Stanton 2013, 2014). While we hold this relationship to have been complicated beyond the ways in which we can detect archaeologically at the present moment, we also believe that the data outlined in chapter 1 point to one simplified conclusion; Cobá incorporated Yaxuná into a Late Classic state system and held considerable sway over the politics of this city in central Yucatán for some time.

Through this whole trajectory, the local people of Yaxuná appear to have enjoyed relatively good health throughout their lives, as compared to other urban inland populations of the Maya lowlands. There is little evidence that the incorporation into the Cobá state had a negative impact on people's access to basic resources. Biocultural practices among the locals tie in with peninsular modes of dental and head looks during the Classic period and at the same time manifest continuity in family traditions and physical embodiment right through the end of occupation. An astounding degree of homogeneity characterizes also the collective phenotype of Yaxuná's settlers. Not all of the ones we sampled were locals, however, as we have learned in chapter 2. Here, as in other settlements, food intake relied heavily on tropical crops such as maize once weaning had occurred.

The burials from this period, albeit from a relatively small sample, exhibit some interesting patterns that we can consider as we take into account the data indicating foreign control at the site (see chapter 6). First, the burials tend to be placed in unprepared graves without any stones lining a crypt space. These simple interments set themselves apart from the burial cohorts of coeval peninsular sites, as is apparent at Late Classic Caucel, where 34 of the 36 recovered graves were cists (Rodríguez Pérez 2010). Also, the many lavish tombs and crypts from Dzibilchaltún and Oxkintok display funerary arrangements, which clearly surpass in quality and quantity the ones seen at Yaxuná at that time (Andrews and Andrews 1980; Fernandez Marquinez and Varela Torrecilla 1992; Uriarte 2004; Varela Torrecilla 1998; Velázquez and García Barrios 2002; Welsh 1988). This is also a time in which shifts in rituals involving human body processing make themselves felt and anticipate the shift toward the close of the Classic period. As described and discussed in chapters 4 and 8, isolated skull deposits, one of them with signs of burning, were deposited in the liminal spaces around the North Acropolis during this time and most probably marked the end of nonfunerary protracted body rituals, as we have argued.

Around the time when Sacbé 1 was abandoned at the end of the Late Classic, Yaxuná experienced an influx of cultural ideas from western Yucatán. As discussed in chapter 1, ceramic and architectural traditions have a distinctly western feel, particularly from the Puuc Hills region, which has been thought to have been the locus for a powerful state-level development during the eighth and ninth centuries AD (e.g., Andrews and Robles 1985; Kowalski 1987; Schele and Freidel 1990; Schele and Mathews 1998). While there is little evidence of a strong ruler at Yaxuná during the seventh century, revitalization projects in the monumental core during Yaxuná IVa target many of the important royal buildings. Str. 6F-3, where the earliest royal was located in Burial 23, was refurbished with a new central staircase and superior temple (Suhler 1996). Str. 6F-68, a council house, was abutted to the south side of Str. 6F-4 where the Burial 24 tomb context was located. Other areas, such as the north side of the East Acropolis and the southern end of the principal north-south site axis were refurbished. All of these projects indicate that the leadership at this city was allowed to re-create the sacred space, emphasizing important monuments that likely figured prominently in the memory of Yaxuná as a royal seat and regional capital (Stanton and Freidel 2005).

The so-called Puuc Group, located just to the south of the North Acropolis, however, has been interpreted as evidence of direct administrative control from the Puuc region (Novelo Rincón 2012), indicating that while local leadership may have experienced a revival, its allegiance, and perhaps to some degree its decision-making, was tied to western interests. We concur with Novelo that the ceramic (most likely an indicator that market ties also gravitated toward the west, influencing both the actual products arriving to Yaxuná and the styles locally produced at Yaxuná, which followed to a great degree the fads in the Puuc region, but not necessarily imposed on the people of Yaxuná) and architectural traditions indicate a profound connection to the Puuc region, one that implies alliance and political influence. Such a situation may also be reflected at early Chichén Itzá, although little is known from this site from the eighth century given the tremendous amount of later architectural overburden (Pérez de Heredia 2010, 2012).

One of the primary questions we wanted to test, however, when we started the analysis of the human remains at Yaxuná, was to what extent, if any, was there evidence of actual movements of people to Yaxuná during this period, specifically from western Yucatán and the Puuc Hills region in particular. Settlement data indicate a large demographic increase at the site during Yaxuná IVa (Shaw 1998) and also across the region, with many rank III and IV sites founded or expanded during this period (Stanton and Magnoni 2013). While we are hesitant to put numbers to this demographic increase due to concerns of how to calculate populations (e.g., sheers numbers of structures, floor space, artifact densities [e.g., Culbert and Rice 1990; Sanders et al. 1979]) and issues of contemporaneity given the large chronological blocks of time we work with in the Maya region, it is evident that such a massive population increase from Yaxuná III to Yaxuná IVa must have been in part due to migration to the region. Yet given the ceramic and architectural data, we were intrigued by the possibility of how this influx of people to the area could have been shaped by individuals and families moving from the west. Interestingly, the bioarchaeological data from Sr isotopes and dental morphology seemingly indicate that few if any individuals from the Puuc region resided at Yaxuná during the Late Classic (Price et al. 2017). Despite some potential isotopic coincidence with the Puuc region in the skeletal sample analyzed, such a signature also characterizes other territories in the Yucatán Peninsula, limiting the possibility of a precise inference on the region of origin of these foreigners. In a similar fashion, the dental morphology data indicate only an indirect relationship between Yaxuná and the Puuc sample. In other words, Yaxuná shares some patterns of dental morphology with the Puuc sample (which could witness biological interaction between the sites), but this affinity is not consistent in all the analyses, more likely indicating a general common morphological background rather than real genetic flow. Unfortunately, we do not have similar samples from Chichén Itzá at this time to test whether the population there was also characterized by similar stable isotope and dental morphology patterns.

Despite the large increase in population size at Yaxuná and its surrounding hinterland during this period, the burial data indicate that the overall health of the population was relatively good in comparison to other areas of the Maya lowlands with comparable data (see chapters 3 and 4 of this volume). Again, we have to be somewhat cautious given the relatively small sample size and the fact that all of the burials come from the urban core of Yaxuná (none of the surrounding sites have yielded skeletal remains despite some excavations in Terminal Classic households [e.g., Johnson 2012]). Yet the largest burial sample at Yaxuná comes from this period with no clear indications of poor health, suggesting that (1) the political and social revival at Yaxuná was accompanied by reasonable access to basic foodstuffs; and (2) the process of increased urbanization at the site did not negatively impact people's health.

One particularly important burial that deserves some discussion given the changing political situation at Yaxuná is Burial 22. Str. 6F-12, where Burial 22 was recovered, is a relatively low, square platform situated in a small ceremonial plaza just to the east of the core of the Puuc Group. The western side of this plaza is flanked by a long platform dating to Yaxuná IVa and supporting two large towers faced with modeled human figures that approximated large stelae (Novelo Rincón 2012). The eastern side of the plaza was bounded by two long buildings with broad staircases (also dating to Yaxuná IVa) that could have functioned as bleachers for an audience to watch events in the plaza. The northern side of the plaza was delimited by the staircase rising to the North Acropolis and the southern side by the Terminal Classic ballcourt. Str. 6F-12 was on the axis connecting the refurbished staircase of Str. 6F-3 to the ballcourt; all of these structures followed the north-south axis of the site, which was first delimited by the Late Formative causeway (Sacbé 3) on which the plaza and then the ballcourt were built. Suffice it to say that this plaza occupied a critical sacred space in the site's geomantic plan and that Str. 6F-12 was its central element (see Stanton and Freidel 2005).

Given the presence of a stucco-lined room in the central portion of Str. 6F-12 and copious evidence for burning, this platform was originally interpreted as the remains of a sweatbath by its excavator (Johnstone 1994). As we have argued in chapter 8, however, we believe the morphology of this platform is distinct from other reported sweatbaths (e.g., Child 2006), and there is a much more likely explanation as to the function of the building—it was a platform for celebrating major public calendric ceremonies, such as New Fire ceremonies or others related to yearly agricultural cycling.

Ceremonies set up in a similar fashion have been described for other pre-Hispanic, colonial, and ethnographic settings in the Maya area and beyond (Bricker 1989; Coggins 1975;

Grube 2000; Taube 1988). Specifically among Contact period Nahua, these culminative festivities were dramatized through the drilling of virgin fire on the opened trunk of victims who were to die by heart extraction and sometimes were cast into the divine brazier where they were burned alive and reduced to bones and ashes, a process that resonates with the myths of primordial autosacrifice (Graulich 1988:158–159, 2005). Although fire was used among the Maya for ritual body processing as early as the Formative period, fiery consumptions gained prominence toward the Late to Terminal Classic period (Tiesler 2016). This also appears to hold true for the Puuc area, where centrally located triadic groups brim with entombed or cached cremains, surpassing the frequency of human fire-exposures reported from contemporary settlements across the Maya lowlands.

The importance of the appearance of such fire rituals at this time concerns the fact that such ritual activities are linked to Central Mexican belief systems. Given that ideological expressions in art and other material culture at Chichén Itzá draw heavily on cultural traditions from the Mexican *altiplano*, we suggest that important cultural traditions such as the celebration and commemoration of important calendrical dates were already shifting toward Central Mexican expression at Yaxuná prior to the inclusion of this site, in broader processes centered at Chichén Itzá that would have led to the arrival of Sotuta Complex ceramics and other material culture such as Pachuca obsidian. In light of the presence of Central Mexican–inspired imagery at Puuc sites such as Uxmal and Kabah during the ninth century AD, we should not be surprised that certain elements of this ideology inspired by the Puuc tradition are found at other sites. Yet it is interesting to note that the process of ideological change appears to be more gradual than previously thought. Instead of this ideology arriving at Chichén Itzá through migrations of foreigners to central Yucatán and then spreading to other areas of the peninsula (along with Sotuta Complex ceramics) as part of a process of bellicose state-building (cf. Andrews and Robles 1985), the relationship between sites like Yaxuná and the Itzá capital may have been much more complex. In any event, we believe that the burial record at Yaxuná, in particular Burial 22, gives us some insight into these complexities.

THE RISE OF CHICHÉN ITZÁ

As important as the early Terminal Classic florescence at Yaxuná was in terms of restoring it to regional prominence as an important social, economic, and political center, it was also short-lived. The dating of the abandonment of Puuc-inspired monumental architecture is rather unclear, but it appears to have occurred sometime during the ninth century AD when Sotuta Complex ceramics from Chichén Itzá begin to appear at the site. The dating of the early occupation at Chichén Itzá itself has been the subject of considerable debate (see Andrews et al. 2003). A non-Sotuta ceramic complex roughly correlating to Yaxuná IVa has been reported at the site (Pérez de Heredia 2010, 2012; José Osorio León, personal communication to Stanton 2014), but evidence of occupation dating to this period has been difficult to access given the tremendous architectural development that Chichén Itzá witnessed during later phases, and which might have masked or erased evidence of previous occupation. Yet most scholars concur that a fully developed Sotuta Complex was in use at the site when monumental architecture and hieroglyphic inscriptions, including dates, were constructed across the site starting as early as the mid-ninth century AD (e.g., Ringle et al. 1998).

While the origins of Chichén Itzá are somewhat obscure, there is little doubt among scholars that it became one of the most important urban centers in Mesoamerica during the ninth century AD. As with Yaxuná during the early part of the Terminal Classic, the population expansion at Chichén Itzá can be explained only if large-scale migration to the area is taken into consideration. Interestingly, across the northern Maya lowlands, there appears to be a demographic decline around AD 900 when Chichén Itzá was in the midst of its demographic growth. Although we must be careful using ceramics to date the abandonment or decline of sites through the region as local styles may have continued for some unknown time past AD 900 (while Sotuta-style ceramics gained popularity in certain areas [Stanton and Bey, n.d.]), many communities appear to be in decline or are outright abandoned around this time.

In the near hinterland areas around Chichén Itzá, including Yaxuná, a clear pattern emerges as communities began to adopt the local ceramic styles popular at the Itzá capital at about this time. A regional survey by the PIPCY project over a roughly 500 km^2 area to the immediate southwest of Chichén Itzá has documented that a massive depopulation occurred, and most of the rank III and IV sites documented for Yaxuná IVa times were abandoned or significantly reduced demographically by Yaxuná IVb times. Apart from Ikil, and potentially X'togil, there are no sizable communities outside of Yaxuná in this area for the latter part of the Terminal Classic. This area, however, is marked by numerous small hamlets, most of which we have documented in the vicinity of known *cenotes* (sinkholes). We believe that the reasons behind this change in settlement patterns are twofold. First, much like the urban pull documented for Teotihuacan toward the end of the Formative period in the Basin of Mexico, Chichén Itzá drew in the surrounding populations during its process of urbanization. Second, the small hamlets that remained on the landscape, also noted to a lesser degree for Yaxuná III times, were the agricultural communities that sustained the subsistence system of the Itzá capital. Only a few larger centers, still quite small in comparison to Chichén Itzá (like Ikil), were left on the landscape, presumably to function as administrative nodes of the Itzá state in its hinterlands.

At Yaxuná itself, the Yaxuná IVa period has been most extensively researched by the INAH project directed by Lourdes Toscano (Novelo Rincón 2012; Toscano Hernandez and Ortegón 2003). The members of this project report the remains of a small village dating to Yaxuná IVb in the vicinity of the Puuc Group. Only one small vaulted structure associated with the North Acropolis is known from the period. Suhler (1996) interprets it as an administrative building used to oversee agricultural production and tribute of the small community living among the ruins of this once important city. A similar situation appears to mark the occupation at Xuenkal, further to the northeast (Vallejo Caliz 2011; Vallejo Caliz and Manahan 2014).

SHIFTS AND SUBSTITUTIONS IN MORTUARY PRACTICES

In an increasingly divisive and hostile political landscape that overshadowed the closing centuries of the first millennium in Yucatán, instability and violence left their print in terms of funerary continuity and change, in imagery, and in the (bio)archaeological record itself. Anthropogenic marks abound in the skeletal vestiges from the epicenters of many lowland Maya capitals, especially during the Terminal Classic, when there is more evidence of mass violence, materialized in large ritual bone features in late deposits at sites such as Calakmul, Becán, Kohunlich, Colhá, and Chichén Itzá itself (Barrett and Scherer 2005; Massey and Steele 1997; Medina Martín and Sánchez Vargas 2007; Tiesler and Cucina 2012b). Around this time, evidence for body cremations, boiling, and trophy taking increases substantially in the middens of urban cores. Namely, ritual body processing reminiscent of Xipe rites, with full horizontal sternal sections, hand and foot deposits, and defleshing of whole bodies, make their way into deposits at Champotón, and further south, Toniná and El Lagartero (Gómez Cobá et al. 2003; Hurtado et al. 2007; Ruíz González et al. 2016). At Chichén Itzá itself, a number of perforations on skulls documented from its sacred sinkhole are testaments to their prior exposure on skull racks when fresh (Tiesler and Lozada 2017). We see changes in ritual posthumous body processing and in patterns of ritualized violence in humans, which are clearly aligned with Mesoamerican highland practices to the west (Miller 2007). What stands out here is that none of the aforementioned changes in ritualized body processing have been documented at Yaxuná itself. This could be an indirect statement of loss of regional leadership, although ultimately, absence of evidence does not mean evidence of absence.

Likewise, the funerary patterns of Chichén Itzá and the area apparently under its control seem to anticipate the mortuary programs that became widespread in Yucatecan inland centers during the first half of the second millennium AD. From this time forward, dead bodies and bones were harbored in simple graves and were also deposited in collective cist graves (ossuaries), many of which contained the remains of up to hundreds of individuals. These ossuaries include many previously cremated remains, either in a fleshed state or already dry. The assemblages from Temple 5C12 (in the Initial Series Group) and the Ossuary from Chichén Itzá (Cobos 2003; Fernández 2006; Schmidt 2007, 2009; Thompson 1938; see also Headrick 1991) are pertinent examples of this type of human disposal, as are the later cremation contexts documented in Mayapán's central structures Q-95 and Q-98 (Serafin 2010) as well as the island center of San Gervasio and coastal Tulúm (Vargas Pacheco 1997). Stacked on the floors of tombs, cists, or vertical shafts inside temple cores, the ossuaries are reported to have integrated all age groups and both sexes when biographic data are documented. These centrally controlled sanctuaries suggest that individual commemoration was gradually replaced by a more collective focus in mourning and veneration, directed toward kin groups and whole communities. The uses of heat and fire become ever more visible in the ancestral transformations of dead noblemen (and surely women), now venerated in animated statues, vessels, or portraits plastered on top of the boiled skulls (Landa 1982). The prolonged

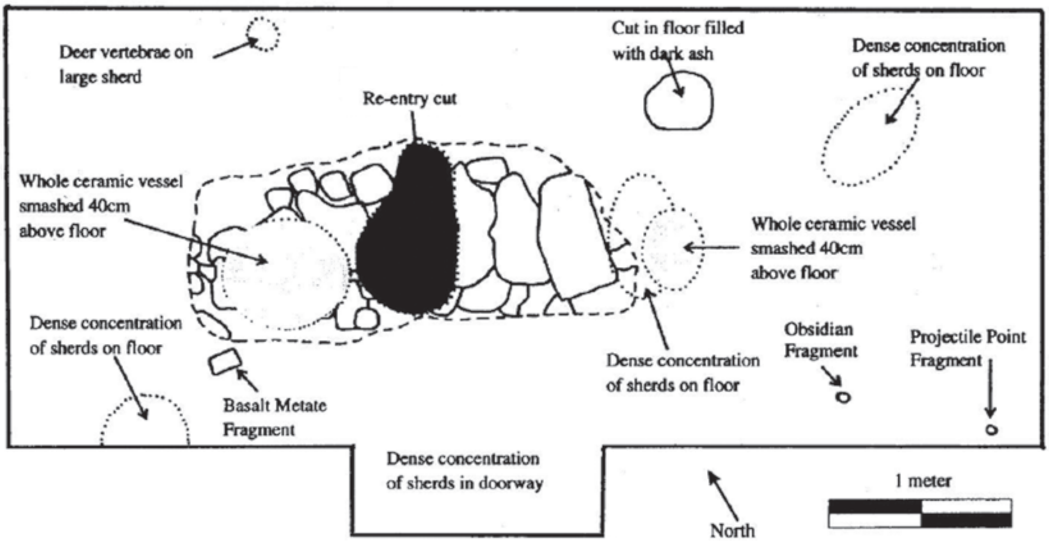


FIGURE 9.1 Drawing of mortuary distribution of Burial 25.

curation of, and social interaction with, these ancestral portraits may explain their absence in today's funerary record, also taking into account the Spaniards' radical efforts to destroy idols and other symbols of heresy.

While no human remains have been recovered from either Yaxuná or Ikil for the latter part of the Terminal Classic, there is one burial context from the early facet of this period at Yaxuná itself that sheds some light on the social processes at work at the transition from Yaxuná IVa to IVb. Burial 25, located beneath the floor of the westernmost room of its council house (Str. 6F-68) on the North Acropolis, has been interpreted as a primary female burial whose grave was desecrated when Chichén Itzá militarily defeated Yaxuná (Ambrosino 1996; Ambrosino et al. 2003).

The construction of Str. 6F-68 dates to Yaxuná IV, and Burial 25 appears to have been placed in the center of Room 3 when the building was erected. Given the themes in the complex basal façade of the structure, it has been interpreted as a *popol nah*, or council house (Ambrosino 2003, 2007); banners, mat symbols, and human figures are all included in the images, which grace the façade. The funerary crypt had been lined with stones, defining an ample interior space whose sizes were 190 cm long by 50 cm wide, consistent with local practices as described in chapter 6. Five flat stone slabs covered the top of the cist, one of which was found out of place when explored by the team (figure 9.1). Being relatively shallow, the sepulcher was revisited and then resealed sometime after initial interment. This second entry probably took place during the massive terminal burning of the area during the ninth or tenth century AD (Ambrosino 2007).

The taphonomy of the individual in this burial indicates that the upper body was badly disturbed by the reentry event (figure 9.2). Yet given that the legs and lower trunk rested in

FIGURE 9.2. (a) General funeral disposition and (b) lower segments of Burial 25 in situ after complete exposure (Yaxuná Project, Selz Foundation).

their original articulated state without showing any effect from bundling, the corpse must have been laid down extended on top of the floor in a complete state. As the funerary space was sealed and was left unfilled, the corpse decomposed gradually and was eventually visited by meso and macrofauna (figure 9.3) before filling up with soil.

The reentry is inferred from the hole dug into the crypt from the above floor. This hole dates to a massive destructive even at Str. 6F-68 when the building was burned, the vaults pulled down, and numerous ceramics vessels were broken and scattered on the floors and

FIGURE 9.3. Bone segments of Burial 25, displaying insect and rodent marks (Yaxuná Project, Selz Foundation/Bioarchaeology and Histology Laboratory, UADY).

directly in front of the building. This activity must have taken place long after skeletonization, perhaps decades or even a century after initial interment. Breaking into the crypt led to disturbances and reductions of this context as well. No traces of the mandible or any cranial bones were encountered by the excavators, which suggests these segments were extracted. This scenario is confirmed by the presence of four loose teeth (all bearing a conical root), which fell out of their sockets prior to the removal of the skull. As the cranial parts, and possibly certain grave goods, were extracted, the upper trunk was disturbed, including both upper arms, which had been lifted during this occasion (figure 9.4). Although present, the left lower arm seemed dislocated, whereas the right lower arm had been left intact and articulated, at the side of the ipsilateral hip bone. The bones of the hand were recorded in their anatomically expected area.

It is noteworthy that the offerings of Burial 25 were scarce and incomplete. Scattered jadeite beads and the fragmented part of a stone mirror base that was documented in the thoracic area of the skeleton seemingly indicate that these represent the remains of more extensive grave goods that were removed. The only apparent grave goods that were intentionally left in the context were deer remains that rested at one side of the right arm. By revising the entire context, it is clear that the crypt was broken into and grave goods, the skull, and mandible were all removed.

The abandonment context of Str. 6F-68 itself was rather spectacular. There is evidence that the building was burned and that a termination ritual was conducted. Burned and broken ceramic vessels from both Yaxuná IVa (Cehpech) and Yaxuná IVb (Sotuta) complexes were found among heavily scorched vestiges on the floors of all three rooms and littering the front of the ruined building. It was at this time that a small hole was dug into the floor at

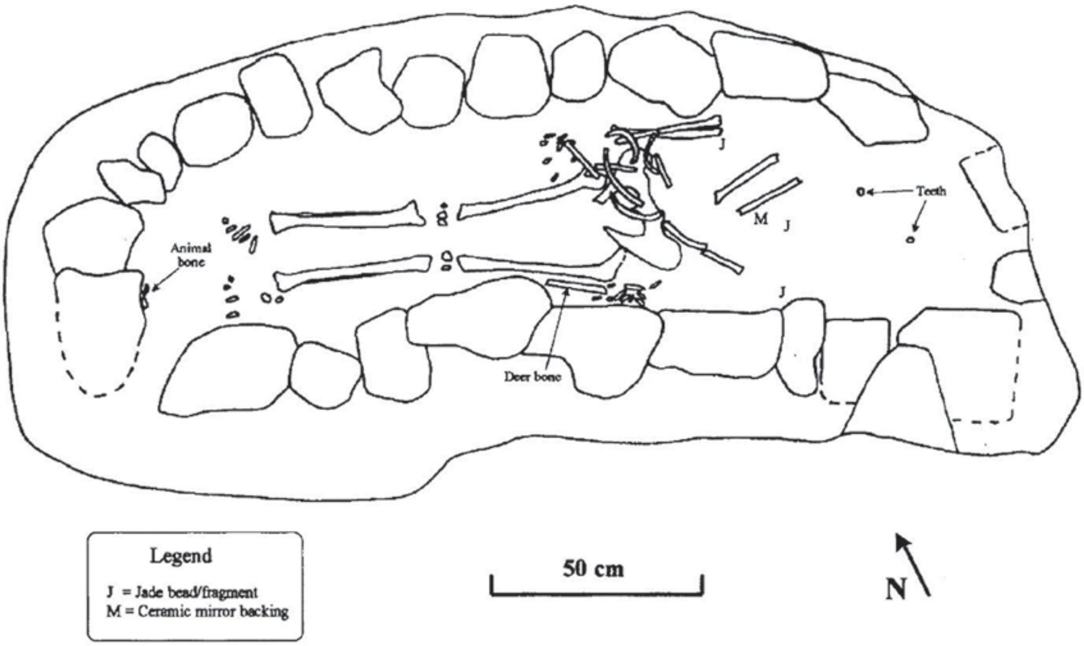


FIGURE 9.4. Anatomic segments of Burial 25 within its container (Yaxuná Project, Selz Foundation).

the center of the Burial 25 context indicating that the disturbance of the burial was part and parcel of a larger ritual event at this structure.

The original hypothesis is that the Itzá warriors ritually ended this council house and killed the ancestor buried beneath the floor as an act of ending the political history of this storied urban center (Ambrosino 2007). Upon further analysis of the context, several points can be made that in some ways alter this interpretation. First, the mixing of Sotuta and Cehpech complex ceramics at Yaxuná, as demonstrated in the Str. 6F-68 abandonment deposit, may not be a product of Itzá warriors bringing their material culture to the site. In all of the cases where Sotuta-looking ceramics have been recovered by the PIPCY project (at Ikil, Popolá, and Yaxuná these have been recovered from stratigraphic excavations and at numerous other sites through surface collections), Sotuta ceramics are always found with Cehpech ceramics. We have yet to record contexts where only Sotuta ceramics are present, indicating that local styles persisted after Sotuta style made its way into the region either through local production emulating this style or through market processes that likely included the supposedly large regional market at Chichén Itzá itself. Thus, the mixing of Sotuta and Cehpech ceramics may not be a result of foreign ceramics arriving with the invading forces, but may have been already present at Yaxuná prior to its political incorporation into the Itzá state.

Second, the removal of the skull has parallels to other cases of ancestor worship (and relic taking) across the Maya area and at Yaxuná itself (Fitzsimmons 2011; Weiss Krejci 2006) and, as we have argued above, is especially relevant as a Postclassic phenomenon, during which the heads of apical ancestors were curated and worshipped on altars. While we still believe that the evidence of contemporary defensive features at the North Acropolis supports the idea that the local rulers of Yaxuná were defeated by the expanding Itzá state, the context of Str. 6F-68 may actually represent a termination ritual conducted by the people from Yaxuná who migrated to the Itzá capital during the "gathering" of regional elite. The destruction of the building may have had ideological overtones given the spread of the Feathered Serpent cult throughout the peninsula at this time, but could also be understood as a *clausura* or ending ceremony in line with ancient Mesoamerican traditions concerning abandonment of important places. Thus, the treatment of Burial 25, including the removal of grave goods and the skull, was very likely part of the process of transporting the lineage ancestors to the new place of residence, the growing urban center of Chichén Itzá.

THE POSTCLASSIC

The Postclassic period at Yaxuná is only represented by ceremonial deposits. As of yet, no Postclassic settlement has been identified at the site, although there were Postclassic communities in the region at sites like Cacalchén and Mopila. At Yaxuná, only a single burial dates to this period. Burial 19 was recovered inside Str. 6F-3 during the explorations of Operation 65 (figure 9.5). It dates to Yaxuná V (1200–1519) and was associated to Chen Mul ceramics. Isotopically determined as a local (Price et al. 2017), this individual was determined as a robust, middle-aged adult male who must have lived a physically demanding life before passing in his fourth or fifth decade of life.

The individual was found some 60 cm below ground, in a corridor just below the central staircase that leads to the central patio of the North Acropolis to the top of the structure. This space, which led to a series of internal passageways leading eventually to Burial 23, was certainly a liminal locus with ritual implications and was on the central north-south axis of the site. A Chen Mul censer, found near the body (figure 9.6), and a series of faunal remains, including deer skulls with their antlers, serpents, and birds (figure 9.7), all indicate the ritual importance of the burial of this individual (Götz and Stanton 2013; Stanton et al. 2010).

As Burial 19 was not lined or covered with stone slabs or rocks (figure 9.7), we consider it a simple platform intrusion, which seems quite shallow and reduced in dimensions for a human interment (35 x 60 cm). However, there are indications that decomposition did occur in an unfilled environment after the corpse had been placed on its right side as a fully flexed bundle. Perhaps wooden tablets were used for the purpose, which would not leave any material evidence today. The orientation of placement aligns with the north-south axis of the monumental access staircase. Afterward, the void filled in with fine whitish *sascab*.

This burial would indicate that ancestral practices, including the actual burial of human remains in key areas of Yaxuná's monumental zone, were ongoing after the abandonment of the site. While it is difficult to understand the nature of these deposits, which also include

FIGURE 9.5. Skeletal disposition of Burial 19 (Yaxuná Project, Selz Foundation).

small C-shaped altars associated with Chen Mul incensarios, they clearly demonstrate an active historical memory of the site. These ruins were still important and remembered by the people living in the region. Whether the burial of this Postclassic individual represents an offering to this sacred place, or the interment of an important person from this later period in the ruins of this historically significant place remains unclear, however.

CONCLUDING THOUGHTS

This closes the scope of this commented synopsis of life and death in Classic period Yaxuná and beyond through the lens of native bodies, corpses, and skeletons. In our efforts to encompass and understand the complexities and conditions of the ancient life- and death-ways among Yaxuná's settlers, we have confronted different approximations and lines of evidence. Although challenging when compared to the data-rich study environments that characterize the central lowland Maya kingdoms with their rich epigraphic records, we hold

FIGURE 9.6. Chen Mul censer associated with Burial 19 (Yaxuná Project, Selz Foundation).

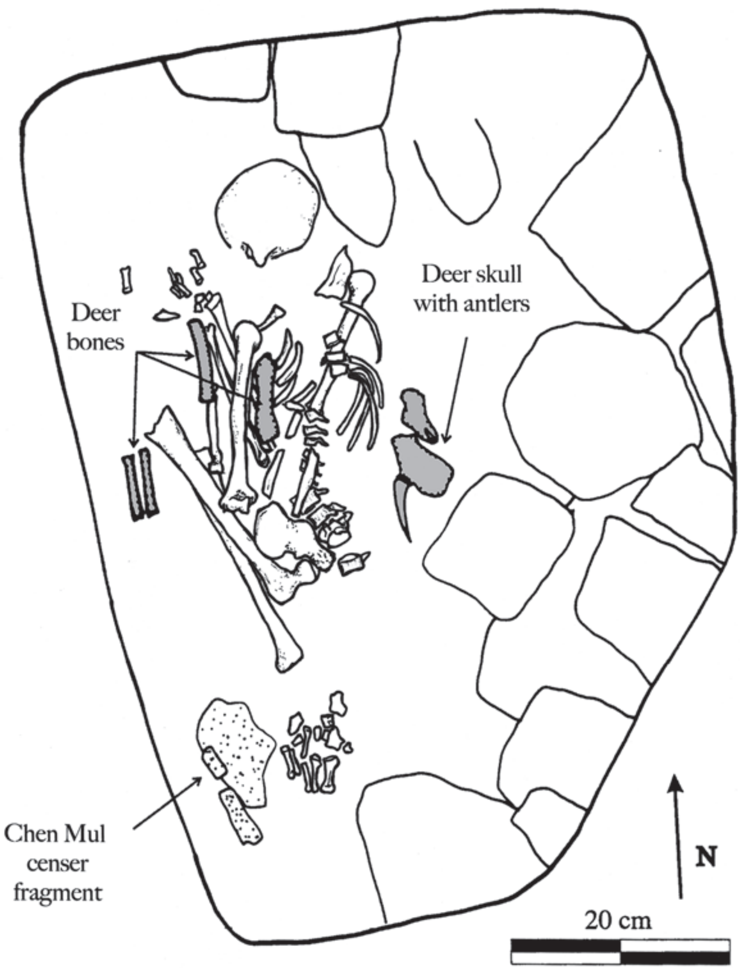


FIGURE 9.7. Arrangement of Burial 19 with censer and associated faunal remains (Yaxuná Project, Selz Foundation; skeleton redrawn by V. Tiesler).

that this body-anchored approach does endorse a new venue of scholarship, especially when engrained with information gleaned from the regional record.

While this last idea rounds out the main theme of this volume, it also brings us back to several points of departures from within this book. One assertion was that human skeletal remains, studied within their mortuary contexts, tell the too often unwritten life and death histories of ancient people; those very actors who forged settlement life and manufactured the material products targeted by conventional archaeology. We often forget that archaeological sites were made because of, and thanks to, these often unnoticed and forgotten players. Nonetheless, understanding their skeletal remains is quintessential in understanding any past society, through the daily lives of their inhabitants, their food habits, lifestyles and diseases, and even the extremes of birth and death. Death is the ultimate indicator of living conditions, but it is also, and most importantly, the event that locks up a whole life into a skeleton, waiting patiently for somebody willing to read the story that it has to tell.

In this interdisciplinary approach, we have endeavored to disentangle some of the unheard voices of Yaxuná's ancient past by combining multiple lines of evidence that deeply sink their roots in archaeology, bioarchaeology, taphonomy, ethnohistory, physical anthropology, and skeletal biology. The joint interpretation of these data has brought back to us some of the essentials of past Maya life already. Such are the conditions experienced during birth and upbringing, migration and cultural identification, quotidian food intake and health issues, and life expectancy and death. We have learned that in Yaxuná, just as in any other settlement of its time and cultural frame, natural death would be followed characteristically by ritual interment and active cycling in memory of the deceased as the protracted funerary pathways of the many successive multiples seem to inform us. These behaviors stand apart from violent episodes of change and terminal closure at the site, such as the event that led to the cramming of several bodies into Burial 24 or the extraction of parts of Burial 25 from the building before its fiery destruction. These mortuary conducts signal broader circumstances of social contingency, crises, and political change.

After the last urban inhabitants of this once important city left, the platforms and temples of Yaxuná were soon ruined and overgrown but remained for posterity in the midst of the northern Yucatecan forest. In the centuries after abandonment the land of the site was sporadically visited and used for refuge and disposal of the dead, materialized by an isolated Postclassic deposit (Burial 19; figure 9.7) and what appears to be a clandestine interment of a female youth during the nineteenth century AD (Burial 10; figure 9.8). The adolescent's body had been positioned in Catholic fashion, extended on her back with her arms crossed over the chest. A metal bullet was found together with the remains and could well have been the cause of her death.

During the last century, this scenery has changed again with Yaxuná reclassified as an archaeological site, which has been exposed over the past thirty years. A narrow road sets it apart from the touristic hub of Pisté and the archaeological development of Chichén Itzá. The ancient ruins of Yaxuná lie next to the small Maya village of the same name (Yaxunáh), nested within the Yaxcabá *municipio* (municipality), an area hard-hit by the

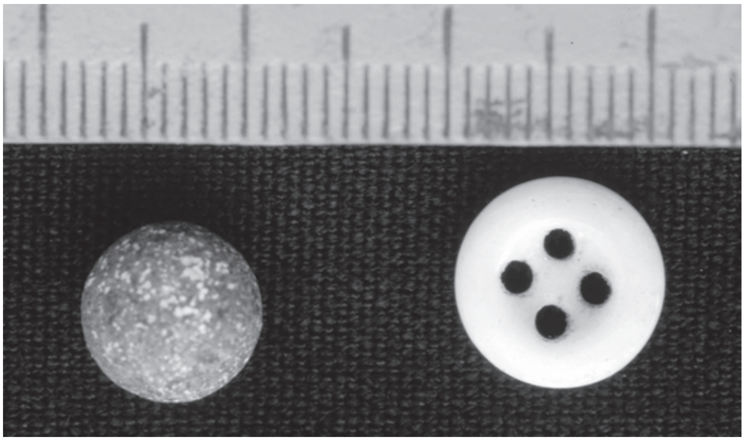


FIGURE 9.8. Metallic gun projectile and porcelain button, found together with Burial 10 (Yaxuná Project, Selz Foundation).

nineteenth-century Caste War. This is a small Yukatec Maya community of less than 1,000 people, embedded in the midst of communal lands that are worked corporately by the local *ejidatarios* since the agrarian reforms that took place some 80 years ago.

Although still marginalized, modernization arrived in the community during the twentieth century and brought with it tap water, access to health care and medication in the form of a local clinic, and telephone service. Over the decades, infant mortality has dropped significantly while life expectancy has risen thanks to antibiotics and sanitation projects. Despite the improvements, rural poverty and lack of agricultural sustainability has drained the local population, parts of which have emigrated to Mérida, the Caribbean coast, or the United States. Traditional healers (*yerbateros*) and shamans (*j-meen*) are still an integral part of the local community, where locals continue to speak the Yukatec Maya (Bascopé and Guderjan 2016).

In the meantime, the ruins of Yaxuná, along with many of the other Classic Maya cities in the region such as Chichén Itzá and Cobá, were soon reenvisioned in the emerging pictures of an "archaeological" past in Mexico, pasts that would be used as a base for modern identity construction and economic activity. In this context the narratives gleaned from the ancient inhabitants of these centers become ever more relevant. At last the actual people who created these cities can have their histories told through their mortal remains. This closes the cycle of this study and this volume in which we have strived to learn about the past of Yaxuná and beyond, through the lens of its people.

NOTES

CHAPTER 1

1. There has been substantial revision of the chronology since the time of the Carnegie Project at Chichén Itzá. We will review our current understanding of the chronology later in the chapter. Just as a point of clarification here, the Carnegie equivalent of today's Terminal Classic period (in their terms "Pure Florescent") was thought to date AD 800–1000, while the following Early Postclassic period (Modified Florescent), when the primary occupation of Chichén Itzá was thought to date, was placed at AD 1000–1200. We now know that a great amount of the monumental architecture at Chichén Itzá was built during the ninth century AD, squarely within the bounds of the Terminal Classic (Andrews et al. 2003; Chung 2009; Cobos 2003; Pérez de Heredia 2010). While the ceramic and architectural chronologies of Chichén Itzá are still hotly debated (Ball 1979; Lincoln 1986; Schele and Mathews 1998), we can safely say that the end of the important Classic period cities such as Uxmal and Tikal overlapped with the beginnings of urbanism at Chichén Itzá. In hindsight this overlap would have, in theory, mitigated the need for the Carnegie archaeologists to find a site, such as Yaxuná, to connect the chronologies of the new and old "empires" (cf. Thompson 1954; Tozzer 1957) in early archaeological narratives of the ancient Maya.
2. The dates for these periods are based on our current understanding of changes in ceramic complexes, which may vary from region to region. Ceramic complexes do not change wholesale from period to period, and in some respects the chronological divisions between complexes are based on the frequency of arbitrarily selected vessel attributes. The dates presented here are the result of a systematic program of radiocarbon dating at Yaxuná undertaken since 2007 using widely accepted ceramic attributes to define complexes.

CHAPTER 2

1. Fisher Exact test shows no differences below the α .05 thresholds.
2. Although in rats, blood-water levels of $\delta^{18}O$ stabilize in about one week after the introduction of foods and liquids with a different isotopic composition (Longinelli 1984).
3. At Tikal (Wright 2012), however, oxygen isotopic values for individuals thought to be "local" based on $^{87}Sr/^{86}Sr$ ratios range approximately from −1‰ to about −5‰ when measured in the canine tooth, and from −2‰ to −5‰ when measured in the third molar. The authors noted that such variability in oxygen values, and the differences between the Early Classic, Late Classic,

and Terminal Classic, could be due to climate changes through times as well as (potentially) to the construction of water reservoirs to recollect rainwater and their seasonal evaporation rates, recharge, and usage (Wright 2012:343). In contrast, at Kaminaljuyú Wright and colleagues (2010) report local values between −4‰ and −6‰ from the Late Preclassic to the Late Classic period, indicating more stability among these factors. In any case, the oxygen values provide a further numeric information to help clarify existing data on movements of people.

CHAPTER 3

1. Paleoepidemiology is an interdisciplinary line of research that applies epidemiological methods to the study of the distribution and determinants of past health-related states or events.
2. This approach limits the possibility of recording grooves or furrows that could be related to any extent to the physiological perikymata striations.

CHAPTER 4

1. For Burial 24-10 we lack Sr isotopic data to make any inference on the individual's place of origin.
2. Level 4 is being reserved for exceptional attritional degrees involving parts of the root in individuals suffering from gum-retraction.
3. A score of 0 indicates that the tooth did not present any evidence of decay. Teeth classified as grade 1 demonstrate that minor demineralization had just started affecting the enamel surface without penetrating deep into the enamel and without reaching the dentin. Grade 2 teeth indicate that the carious lesion penetrated the enamel and reached the underlying dentin. A score of grade 3 shows that a deep cavity penetrating the dentin and reaching the pulp chamber had occurred. Finally, teeth classified as grade 4 indicate a cavity that had destroyed most of the crown (Cucina et al. 2011a).

CHAPTER 5

1. It should be kept in mind that head-shaping practices were carried out by females on babies. As the skeletal remnants of the ancient Maya communicate, male and female babies were seemingly granted equivalent artificial morphologies, and noble infants show similar head styles to those that were common in their kingdom. It appears therefore that babies were modeled at a social age when they were still conceived of mainly as "ungendered," as "nonpeople" in the works, in preparation for posterior social integration, the time that "reason" entered their bodies (Cervera 2007; Tiesler 2011a, 2011b).
2. This includes the populations of Dzibilchaltún, Oxkintok, Chac, Yaxuná, and Noh Bec, among others.
3. Extensive patches of ossified hemorrhages cover the areas of ligamentous muscle insertions and indicate a pathological weakening of the connective tissue, probably a side effect of a systemic metabolic condition.
4. Such is the case of top flattening, a cranial modification that was apparently subscribed to maritime trader communities with ties to the west but was not seen on the Yucatecan shelf before the apex of Chichén Itzá (Tiesler 2014, 2015).

CHAPTER 6

1. Before the skeletal remains are lifted and detailed, anatomical and contextual data is lost.
2. This dish and the ceramic material from the surrounding matrix were used to assign a Yaxuná III designation.
3. Burial 14 is located in the extreme southeast of the excavation unit right up against two of the unit walls. As with Burial 12, the Yaxuná III designation was assigned based on the ceramic materials.
4. During the Early Classic, this structure was expanded and the only stela known from the site was erected along the centerline of the staircase leading to the plaza. A series of three vaulted rooms were also erected on this side of the building. At some point in the latter stages of the Early Classic the Burial 24 tomb was placed. All of these data indicate that Str. 6F-4 was an important political and ceremonial building at Yaxuná.
5. The Chac II burials are reported in a seated position. From the position of the skeletal remains, Burial 28 at Yaxuná also appears seated.
6. This assignment is founded on the ceramic wares found within the grave and in the fill of the structure.
7. This residential complex has been interpreted as a Puuc administrative space, which came to control Yaxuná (Novelo Rincón 2012).

CHAPTER 7

1. Labyrinth rituals were known in the Early Classic northern lowlands. An Early Classic ruler with a Formative style royal jewel was interred at Oxkintok in Tomb 1. Probably a secondary burial, archaeologists discovered him interred in a blocked-off room segment in the Satunsat, the labyrinth structure there (Varela Torrecilla and Braswell 2003).
2. The notion of fiery termination events is evoked by the epigraphic inscriptions that talk of fire entering the [dead soul's] house (Stuart 1998:396–399).
3. The northernmost reference to the Kaanul hegemony is a sixth-century queen at Yo'okop, some 100 km south of Yaxuná. This suggests that Kaanul was indeed operating in the northern lowlands during the Early Classic period.

CHAPTER 8

1. Histological sections, obtained from one long bone diaphysis, indicate that remodeling had just set in (which occurs between 15 to 20 years of age), still showing drifting osteons in the bone matrix.
2. With signs of warping, conical and transverse heat fractures, stratification of bone layers, whitish to blue surface tones, multiple heat fractures, and banding (Schmidt and Symes 2008).
3. Further primary cremations of this kind come from the urban centers of Classic period Oxkintok, Colhá, and Dos Pilas.
4. From this aspect we infer that the corpse was either before or well past rigor mortis when being deposited, allowing for maximum relaxation of the neck musculature.

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