

The Ancient Maya

New Perspectives

ABC-CLIO's
Understanding Ancient Civilizations

Forthcoming

Ancient Canaan and Israel

The Ancient Celts

The Ancient Egyptians

The Ancient Greeks

Ancient Mesopotamia

The Aztecs

The Incas

The Romans

The Ancient Maya

New Perspectives

Heather McKillop

A B C  C L I O
Santa Barbara, California
Denver, Colorado Oxford, England

Copyright 2004 by Heather McKillop

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, except for the inclusion of brief quotations in a review, without prior permission in writing from the publishers.

All maps by Mary Lee Eggart.

Library of Congress Cataloging-in-Publication Data

McKillop, Heather Irene

The ancient Maya : new perspectives / Heather McKillop.

p. cm. — (Understanding ancient civilizations)

Includes bibliographical references and index.

ISBN 1-57607-696-2 (alk. paper) — ISBN 1-57607-697-0 (e-book)

1. Mayas—History. 2. Mayas—Antiquities. 3. Mayas—Social life and customs. 4. Mexico—Antiquities. 5. Central America—Antiquities.

I. Title. II. Series.

F1435.M485 2003

972.81'016—dc22

2003016239

04 05 06 07 08 10 9 8 7 6 5 4 3 2 1

This book is also available on the World Wide Web as an eBook. Visit abc-clio.com for details.

ABC-CLIO, Inc.

130 Cremona Drive, P.O. Box 1911

Santa Barbara, California 93116-1911

This book is printed on acid-free paper.

Manufactured in the United States of America

To GORDON, BOB, ELEANOR, and TIGER

This page intentionally left blank

Contents

List of Maps xi

Series Editor's Preface xiii

Preface xv

Acknowledgments xvii

Part One: Introduction

Chapter 1 Introduction 3

Overview of Maya Civilization 7

Sources of Information on the Maya 14

Part Two: Maya Civilization

Chapter 2 Location of Maya Area and Environmental Setting 29

General Natural and Cultural Subdivisions 29

Modern Environmental Changes 36

Chapter 3 Historical and Chronological Setting 41

History of Research 41

Chronology of the Maya 59

Creation Myth 62

Ethnohistoric Accounts 63

Chapter 4 Origins, Growth, and Decline of the Maya Civilization 71

Pre-Maya People: The Paleoindians 72

Small Game Hunters of the Archaic 75

The Early Preclassic Period 77

The Earliest Maya on the Pacific Coast 77

Middle Preclassic Expansion of Village Farming 78

Antecedents to the Classic Maya Civilization: Olmec and Izapa 80

The Origins of Maya Civilization 88

Classic Maya Civilization 90

The Terminal Classic Florescence in the Northern Maya Lowlands (A.D. 800–1000)	100
Chichen Itza	102
Mayapan and the Late Postclassic Maya	104
The Spanish Conquest	105
Chapter 5 Economics	114
Maya Workshops and Craft Production	119
Household Production	122
Classic Maya Workshops	123
Craft Production for Maya Royalty	126
Systems of Subsistence	127
Maya Trade	130
Summary	141
Chapter 6 Social Organization and Social Structure	150
Settlement Patterns	150
Community Patterns	150
Regional Settlement Patterns	154
Pan-Lowland Settlement Patterns	155
Marriage and the Family	155
Social Stratification	159
Population Estimates	162
Ancient Maya Demography	167
Population Data for the Maya Lowlands	169
Chapter 7 Politics	175
Political Structure	176
The Preclassic Origins of Maya Kingship	181
Politics and the Development of Kingship in the Early Classic Period	182
Teotihuacan “Influence”	182
Late Classic Politics and Warfare	186
Warfare	188
Political Geography	196
Chapter 8 Religion and Ideology	204
Maya Ideology: The <i>Popol Vuh</i>	206
Cosmology	213
The Ball Game	213
Pantheon of Gods, Goddesses, and Other Supernatural Beings	217
Rituals	221
Evidence	223
Chapter 9 Material Culture	229
Natural Resources	229
Architecture and Urban Planning	233

Maya Pottery 243
Stone Tools and Other Artifacts 247
Food Plants 251
Minerals 252
Mural Painting 252
Sculpture 256
Paper Books 258
Metalwork: Gold and Copper 259
Wooden Artifacts 260
Bone and Shell Artifacts 261
Food Animals 262
Death 263

Chapter 10 Intellectual Accomplishments 276
Mathematics 276
Calendars 277
Astronomy 282
Astronomy and Maya Architecture 287
Language and Writing 288
Sample Maya Text with Translation 297

Part Three: Current Assessments

Chapter 11 Major Controversies and Future Directions in the Study of the Maya Civilization 307
The Classic Maya Collapse 307
City-State, Empire, or Chiefdom 313
Feeding the Masses 316
Illegal Trade in Maya Antiquities 316
Future Directions in Maya Archaeology 318

Glossary 323

Chronology 343

Resources for Further Study 355

Index 423

About the Author 453

This page intentionally left blank

List of Maps

Map of the Maya Area Showing Subareas and Sites	4
Archaeological Research Programs in the Maya Area	18
Rivers, Mountains, and Subareas in the Maya Area	30
Archaeological Sites Investigated in the Maya Area	43
Archaeological Sites Investigated in Belize	44
Preceramic and Early Ceramic Sites	74
Late Preclassic Sites	81
Classic and Postclassic Sites	91
Sites about Workshops and Economic Specialization	116
Sites about Subsistence	128
Sites about Trade	132
Sites about Social Organization	151
Sites about Politics	177
Sites about Religion and Ideology	205
Sites about Architecture, Artifacts, and Natural Resources	231
Sites about Intellectual Developments	278
Sites about Current Issues and Future Directions	309

This page intentionally left blank

Series Editor's Preface

In recent years, there has been a significant and steady increase of academic and popular interest in the study of past civilizations. This is due in part to the dramatic coverage—real or imagined—of the archaeological profession in popular film and television, and to the extensive journalistic reporting of spectacular new finds from all parts of the world. Yet, because archaeologists and other scholars have tended to approach their study of ancient peoples and civilizations exclusively from their own disciplinary perspectives and for their professional colleagues, there has long been a lack of general factual and other research resources available for the nonspecialist. The Understanding Ancient Civilizations series is intended to fill that need.

Volumes in the series are principally designed to introduce the general reader, student, and nonspecialist to the study of specific ancient civilizations. Each volume is devoted to a particular archaeological culture (for example, the ancient Maya of southern Mexico and adjacent Guatemala) or cultural region (for example, Israel and Canaan) and seeks to achieve, with careful selectivity and astute critical assessment of the literature, an expression of a particular civilization and an appreciation of its achievements.

The keynote of the Understanding Ancient Civilizations series is to provide, in a uniform format, an interpretation of each civilization that will express its culture and place in the world as well as the qualities and background that make it unique. Series titles include volumes on the archaeology and prehistory of the ancient civilizations of Egypt, Greece, Rome, and Mesopotamia, as well as the achievements of the Celts, Aztecs, and Inca, among others. Still more books are in the planning stage.

I was particularly fortunate in having Kevin Downing from ABC-CLIO contact me in search of an editor for a series about archaeology. It is a simple statement of the truth that there would be no series without him. I am also lucky to have Simon Mason, Kevin's successor from ABC-CLIO, continue to push the production of the series. Given the scale of the project and the schedule for production, he deserves more than a sincere thank you.

John Weeks

This page intentionally left blank

Preface

It is indeed a pleasure and a wonderful opportunity to present an overview of the ancient Maya civilization and to include my interpretations and perspectives as well as those of my colleagues. Readers might notice my interest in ancient economy and may notice the variability within ancient Maya culture, including both the dynastic rulers and the common folk, the large cities as well as the smaller communities.

I hope that this book helps address the insatiable interest among the public and students about the ancient Maya. In writing the book, I was targeting it to the educated public (or, as my senior editor put it, “the educated reader of the *New York Times*”!), as well as students. I hope the book will be useful both as a reference and as a text for classes. I have used the text to teach both a graduate class on the Maya and an advanced undergraduate class.

There are many variant spellings for ancient Maya words, and a new lexicon was recently introduced that more carefully reflects the indigenous Mayan languages developed by Maya linguists and indigenous Maya in Guatemala (Coe and Stone 2001, 19; Freidel, Schele, and Parker 1993). The new orthography better represents words phonetically than the orthography imposed by the Spaniards in colonial times, replacing, for example, *Uaxactun* with *Waxaktun*, and *Yukatek* with *Yucatec*. Acceptance of the new orthography will standardize the varied spellings used by researchers, missionaries, and others that have previously resulted in a disturbing array of spellings of Maya words and place names. For example, Freidel et al. (1993, 16) point out that the Maya word for *lord* is variously written *ahaw*, *ahau*, *ajau*, *ajaw*, or *axaw*. In order to communicate most easily to a broad audience, including specialists, students, and the educated public, I have chosen to use traditional spellings that are more familiar and commonly used in the published literature. In addition, I have omitted accents and other diacritics to facilitate communication and reading.

Here are some basic guidelines for pronouncing the names of Maya sites and other Maya words. Generally, all letters are pronounced. The “au” in the word *ahau* is pronounced like “ow” in the English word *how*. For the site of Uaxactun, the letter “u” is pronounced “w,” the letter “x” is pronounced “sh,” and “c” is pronounced “k.” *Tun* is a common word, meaning day, and is pronounced like the English word *tune*. Phonetically, Uaxactun is pronounced “Wash-ak-tune,” with the emphasis on the last syllable, as is the rule. For other words, generally “a” is short as in the English word *father*, so that the site name Altun Ha is pronounced

“All tune ha,” with the emphasis on the last syllable. Knowing that the letter “i” is pronounced like the “ea” in *eat*, the site name Tikal can be pronounced “Tea-kal.” The above guidelines can be applied to other sites, such as Copan, Lubaantun (with the “aa” a short “a” as in *father*), Dzibilchaltun, Cozumel (with the “e” sound short as in *elephant*), and Kaminaljuyu (with the “j” pronounced like “h”).

Although this book is about the ancient Maya, especially the civilization that developed in the rainforest of Central America between A.D. 300 and 900, I remind readers that the Maya people continue to live in Belize, Guatemala, Mexico, Honduras, and El Salvador, as well as having emigrated and continuing to emigrate to other countries.

REFERENCES

Coe, Michael D., and Mark Van Stone. 2001. *Reading the Maya Glyphs*. New York: Thames & Hudson.

Friedel, David A., Linda Schele, and Joy Parker. 1993. *Maya Cosmos: Three Thousand Years on the Shaman's Path*. New York: Morrow.

Acknowledgments

I appreciate this wonderful opportunity and hope that this book brings some of my work and that of my colleagues to a broader audience. I would like to thank those who encouraged, instructed, and talked with me about Maya archaeology, who listened to me in classes, and who participated with me in fieldwork in Belize, including students, Earthwatch workers, and other volunteers. In particular, I would like to thank Paul Healy, my M.A. advisor at Trent University, and Barbara Voorhies, my Ph.D. advisor at University of California, Santa Barbara. I thank the government of Belize, and particularly the present and past archaeological commissioners, for granting me permits to carry out fieldwork for many years along the coast of Belize.

I thank John Weeks for providing me the opportunity to write this book and thereby express my views on the ancient Maya. I thank my senior editor at ABC-CLIO, Simon Mason, for patiently encouraging me in this endeavor, as well as the many other people at ABC-CLIO who helped in various ways. I appreciate the thoughtful discussions of the graduate students in my Mesoamerican Archaeology class in the Spring of 2003 at Louisiana State University (LSU), who accepted e-mailed chapters from this book for class discussion: Samantha Euraque, Marsha Hernandez, Jamie Hughes, Erin Lund, Lara Lundy, Hampton Peele, Kevin Pemberton, Erika Roberts, Bretton Somers, Fiona Vasbinder, and Olga Yermakonov.

Several individuals provided me with slides for this book, including Jaime Awe, Pat Colquette, Ed Kurjack, Virginia Ochoa, Bretton Somers, and Terance Winemiller, for which I am grateful. I thank Mary Lee Eggart of LSU for drawing the maps. I appreciate the assistance of Bretton Somers and Saraphine Latchie, who helped with the bibliography. Bill Davidson, as chair of the Department of Geography and Anthropology at LSU, provided me with a semester course release, which gave me time to begin writing this book, for which I am grateful.

I appreciate the encouragement and insights of my husband, Robert Tague, and the enthusiastic interest of our daughter, Eleanor, in the ancient and modern Maya.

This page intentionally left blank

Part 1

Introduction

This page intentionally left blank

1

Introduction

The ancient Maya evoke images of temples shrouded by rainforest vegetation, of partially deciphered hieroglyphs, and of carved and painted pictures of ritual bloodletting. Widespread public attention was drawn to Maya cities following John Lloyd Stephens's 1841 publication of *Incidents of Travel in Central America, Chiapas, and Yucatan* (Stephens 1969). Misconceptions about the rise and fall of the Maya civilization developed in part from the difficulty of carrying out archaeological fieldwork in the rainforest landscape of Guatemala, Belize, and parts of Mexico, Honduras, and El Salvador, where the ancient Maya civilization developed.

Unlike with the Aztec and Inca civilizations encountered by the sixteenth-century Spanish explorers, the earlier collapse of the Maya civilization and



View from Tikal's Temple 4 overlooking the rainforest to Temples 5, 1, and 2

(Courtesy B. Somers)



Map of the Maya area showing subareas and sites mentioned in the text

abandonment of its cities in the ninth century only added to the mystery. By the turn of the twenty-first century, however, significant strides had been made in understanding the development and demise of the Maya civilization. Insights were due to an exponential growth in the amount of fieldwork, to the deciphering of many of the hieroglyphs, and to the study of the painted and carved iconography on pottery, stone, and other media.

The tropical rainforest setting has seemed to scholars and the public alike as an unlikely location for the rise of a great civilization. Most other ancient civilizations developed in arid landscapes and arguably were based on elite management of water resources through irrigation. Not only was this the case for Teotihuacan, the highland Mexican state contemporaneous with the Classic Maya, but also for the river valley kingdoms that developed along the coast of Peru, along the Nile, along the Tigris-Euphrates, and in China. If the “slash and burn” farming technique of the modern Maya was used by the ancient Maya, urban populations must have been quite small (Morley 1946). In fact, population estimates based on early twentieth-century excavations at Uaxactun, Chichen Itza, Copan, and other sites supported the idea that Maya capitals were “empty ceremonial centers” where the priests and other leaders lived, but that the bulk of the Maya were rural farmers who lived in the surrounding countryside (Thompson 1970). Subsequent surveys beyond the central part of the region where most of the cities were concentrated indicated, however, that there were populations in the tens of thousands or perhaps more at big cities such as Tikal (Harrison 1999). The discovery that the ancient Maya also used more intensive farming techniques than slash and burn led to much research on ancient Maya food production. The discovery of the use of terraced hillslopes, raised fields created by canals through swamps, orchards, household kitchen gardens, hunting, and fishing meant both that more food was produced and that larger population densities were supported than had been previously imagined (Harrison and Turner 1978; McKillop 1994; White 1999).

Decipherment of many of the Mayan hieroglyphs by the beginning of the twenty-first century transformed our modern understanding of the ancient Maya. The discovery by the Russian scholar Yuri Knorozov (1958) that Mayan hieroglyphs were phonetic contrasted with the popular view that the Mayan hieroglyphs were based on picture writing (logographs). As a result, tremendous strides were made in decipherment and the tracing of modern Mayan languages to ancestral Classic Chol Mayan (Houston, Mazariegos, and Stuart 2001; Matthews 2003). Tatiana Proskouriakoff (1960) made the other critical discovery in Maya epigraphy that was a catalyst for further research. She pointed out that the hieroglyphs on the carved stone monuments (stelae) recorded historical information and the military exploits of Classic Maya royalty. This discovery contrasted to popular views of Maya priests being focused on astronomy and fixated on mathematics. Although the Classic Maya were very knowledgeable in these areas, the main use for hieroglyphs was historical. The hieroglyphs and accompanying images also enmeshed the lives of Maya kings and queens into rituals, myths, and stories of creation as told in the *Popol Vuh*, a historic text (Freidel, Schele, and Parker 1993; Milbrath 1999; Tedlock 1985).



Main Plaza at Tikal, Guatemala

(Courtesy B. Somers)

Only by the late twentieth century did Maya researchers recognize that the Maya lowlands were environmentally diverse and that this diversity was important in the course of Maya prehistory. This diversity includes food resources as well as materials such as chert and granite used to make stone tools; stingray spines and seashells used in rituals; and even the basic building blocks of Maya buildings: Limestone, sandstone, and coral rock were variously locally available and used in construction. This diversity of resources indicated that there was more trade within the Maya lowlands than had been previously thought. Local exchange played an important role in the development of the Maya political economy—even though it may not seem to us as glamorous as long-distance trade by canoe in the sea or by trade along rivers or by human porters on overland trails. Maya trade studies were dominated in the late twentieth century by studies of obsidian, which does not naturally occur in the limestone platform of the Maya lowlands but which was ubiquitous at Maya sites throughout prehistory. Obsidian was commonly used for ritual bloodletting but also as a sharp-edged cutting implement for other tasks. Moreover, the facility to chemically “fingerprint” obsidian artifacts to their origins in the volcanic highlands of Guatemala, Mexico, and Honduras allowed archaeologists to present skeletal structures of long-distance Maya trade (Hammond 1972; Healy, McKillop, and Walsh 1984; McKillop et al. 1988; Nelson 1985). By the turn of the twenty-first century, it was clear that the ancient Maya economy included goods and resources of fine manufacture that sometimes

had value added by their exotic origin and that were part of the “political economy” of Maya royalty, as well as goods and resources that formed the backbone of the subsistence economy, obtained from a variety of locations both close to home and farther away (Graham 1987; Masson and Freidel 2002; McKillop 2002).

The collapse of the Maya civilization in the ninth century continues to arouse the interest of the public and to entertain heated debates among Mayanists. Three competing theories remain popular among a plethora of other hypotheses. In the first model, overpopulation and overuse of the land from extensive clearing of the rainforest precipitated ecological disaster and abandonment of the cities. This model was popular in the late twentieth century and provided a cautionary analog for modern Western society (Culbert 1973). In a second model, endemic warfare among competing city-states led to military, marriage, and trading alliances among lowland city-states that aggressively attacked, plundered, and overpowered their neighbors. Some archaeologists believe this caused the breakdown of dynastic power and caused the urban centers to collapse like a house of cards (Demarest 1997), but others attribute endemic warfare to ecological collapse (Webster 2002). A third view holds that catastrophic environmental change was instrumental in an ecological disaster that caused the Classic Maya civilization to collapse (Gill 2000; Hodell, Curtis, and Brenner 1995). In this scenario, a drought occurred that was both more dramatic and more devastating than the regular fluctuations in rainfall, and this catastrophic environmental change meant insufficient rainfall for agriculture, ultimately resulting in famine and loss of life (Gill 2000). The relationship between environmental and cultural agents, and these agents’ part in social change, has a long and tempestuous history among Maya researchers (Meggers 1954). There was likely a complex interplay between the two that was often coincidental rather than causal (McKillop 2002; McKillop 2003).

OVERVIEW OF MAYA CIVILIZATION

Paleoindian and Archaic Periods

Although the earliest evidence of people in Central America dates to the time of the retreat of the Pleistocene glacier, the first traces of ancient Maya culture (as indicated by the first appearance of pottery) are from much later. The earliest inhabitants of the Maya area used stone tools to hunt ice age animals during the Paleoindian period, which began about 9500 B.C. Following the extinction of ice age animals, smaller animals such as deer and rabbits were hunted by people during the Archaic period, which ends with the first pottery in the Maya area. Both the Paleoindian and Archaic periods are poorly known in the Maya area, but comparisons with other areas in Mexico and North America provide important clues about the ancient adaptation of the earliest inhabitants of the Maya area.

Preclassic Period

The earliest Maya date to about 1800 B.C. along the Pacific coast of Guatemala and to 1000 B.C. in the southern Maya lowlands, marking the beginning of the

Early and Middle Preclassic periods in each area, respectively. These early Maya were farmers living in small villages, with pole and thatch houses on low, earthen platforms, such as found at Cuello in northern Belize. The early pottery of Cuello, Santa Rita, Colha, and other sites is quite sophisticated, arguing for as yet undiscovered precursors to the Maya (Hammond 1991). The Middle Preclassic, as well as other time periods, includes smaller divisions of times called phases, each characterized by a specific ceramic complex—all the pottery styles used in that phase.

The Late Preclassic period (300 B.C.–A.D. 300) marked the rise of cultural complexity, as seen in temples with stuccoed and painted façades, built by the common folk at the instructions of the emerging elite rulers. The site of Cerros, Belize, was an important Late Preclassic community, with a core area consisting of temples and other elite buildings and a larger area of dispersed small households beyond. The Late Preclassic is also noted for the development of long-distance trade for elite items, such as jade and obsidian. These goods were commissioned by the ruling elite, used during their lifetimes, and often ritually buried as grave offerings, building dedications, or building terminations (rituals involving smashing pots or other offerings before a building was abandoned). Stucco masks on temple façades at Cerros, Tikal, Uaxactun, and Dzibilchaltun point to long-distance communication among emerging elites, communication that may actually have fostered the development of the Classic Maya civilization.

Classic Period

The Classic period (A.D. 300–900) is defined as the time when the Maya erected stelae, carved monuments with dates in the Maya long count (a counting system dating events to the beginning of the Maya calendar, equivalent to the year 3114 B.C. in our calendar). The earliest dated stela is from A.D. 292 at Tikal. The last dated monument is from A.D. 909 at Tonina, Mexico. The stelae are stone slabs, each with a depiction of an important Maya person on one face, hieroglyphic writing and dates on the other face, and sometimes writing on the sides as well. The stelae were erected in front of temples and palaces in the central areas of Classic period cities for public viewing. The monuments recounted significant events in a ruler's life, notably birth, marriage, accession to the throne, battles won, and death (Martin and Grube 2000).

The kings and queens of royal Maya dynasties ruled the Classic Maya. The ruler and the royal court of each city-state were supported in part by subsistence farmers who provided labor and food to the Maya royalty. The royal Maya courts were located in the cities, including craft specialists producing finely made goods for the elite; artisans working on a variety of building, plastering, and craft projects; and bureaucrats.

Royal Maya women had power, sometimes by virtue of a marriage alliance with another city-state, as the mother of a young king, or as a ruling queen. They are often depicted in high art involved in rituals and ceremonies. Grave offerings were associated with women of all ranks, reflecting their royal dynasty or membership in a lower-class lineage. Artistic depictions show women

of various ranks involved in a variety of tasks, including weaving and grinding corn on metates (flat grinding stones). Royal Maya women were more politically visible than their modern or historic counterparts (Ardren 2002).

Although the basic features of Maya civilization crystalized during the Early Classic period (A.D. 300–600), the height of the Maya civilization was during the Late Classic period (A.D. 600–900), when building efforts, population, and artistic endeavors reached their peaks. The high population densities in cities increasingly taxed the Maya farmers: They provided labor to construct the Maya temples and palaces and to produce food for the city folk. By the Late Classic period, warfare was endemic among the lowland Maya city-states. Maya kings and queens competed for control of neighboring cities, their territory, tribute and tax base, trade routes, and political power. The last hundred years of unrest in the Late Classic period are referred to as the Terminal Classic period (A.D. 800–900).

Maya settlement patterns reveal a hierarchical social structure. Each city-state had a capital with towns and villages located around it, owing political and economic allegiance to that city. The basic unit of Maya architecture was the plazuela (plaza group), consisting of several buildings around a central plaza. The plazuela was the basis for household architecture as well as for the architecture of the temples and palaces in the city cores. Consequently, the urban area of Maya cities was dispersed. The main plaza of a city consisted of a temple along one or two sides, with palaces or elite administrative buildings along the other two sides, with a ball court (see explanation following) nearby. The temple consisted of a large, rubble-filled platform with a small room on top and often a decorative architectural extension termed a “roof comb” that further elevated the temple.

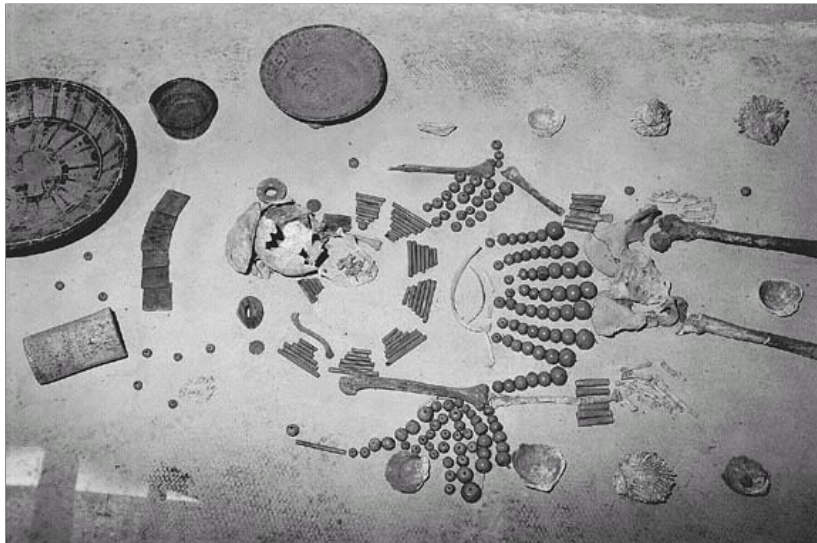
Ball courts were a feature of Maya cities but not of smaller communities (Whittington 2001). The court was located at the city center, and the ball game was an important political event, with the cost of losing sometimes being death. The game was played with a rubber ball (made from the latex of indigenous rubber trees, *Castilla elastica*), and the players had elaborate gear. Depictions of the ball game in progress can be seen in carvings at the ball court at Chichen Itza and on a ball court marker from Lubaantun in southern Belize, for example. The ritual significance of the ball game is tied to the origin myth of the Maya Hero Twins recorded in the *Popol Vuh*, a historic text (Tedlock 1985).

The Maya had no separate cemeteries but instead buried people under the floors and in the foundations of residences and temples. The royal Maya were interred in stone tombs in the temples that had been the foci of their rituals and political lives. This tradition reflects the importance the Maya placed on ancestry, lineage membership, and, during the Classic period, in the dynastic records of Maya kings and queens. Pottery vessels, obsidian and chert artifacts, shell, carved bone, and various perishable items were placed as grave offerings, with the number of items and their level of craftsmanship reflecting the deceased’s social standing.

The Maya developed systems of agriculture to suit their varied living environments and the increasing population. Although slash-and-burn agriculture



Ball court at Chichen Itza
(Courtesy T. Winemiller)



A reconstruction of a burial at Tikal containing jade, obsidian, and finely made pottery
(Corbis/Wolfgang Kaehler)

was carried out, hillslopes were terraced, canals were dug in swamps to create drained or raised-field agriculture, and people had kitchen gardens and orchards. Traces of agricultural activity—notably at Ceren where fields and orchards were preserved by a volcanic eruption—together with preserved plant remains from Cerros, Colha, Copan, Wild Cane Cay, Frenchman's Cay, and Ceren, reveal that the Maya ate corn, beans, and tree crops such as native palms and forest fruits. With few domesticated animals—dogs, Muscovy ducks, and stingless bees—the Maya relied on wild animals for meat, including fish at coastal sites and deer and peccary inland. Human skeletal studies indicate that the Maya were relatively healthy. Some studies indicate that the common Maya were shorter than the elite Maya (Haviland 1967), although this estimate may be unreliable as the sample size is small (Danforth 1999).

Although most of the everyday goods and resources were obtained from nearby locations, obsidian, jade, exotic pottery, marine resources, and mercury were obtained from distant areas by the elite and were displayed as status symbols. Some exotics, such as obsidian, a volcanic rock used to make sharp-edged blades, were traded to even the common Maya. Trade, as well as fairs and religious events, was focused in the city. Trading ports along the Caribbean included sites at Wild Cane Cay, Cozumel, and Isla Cerritos. Boat models recovered from Altun Ha, Moho Cay, and Orlando's Jewfish, as well as drawings of canoes incised on bone objects from a burial in Temple 1 at Tikal, indicate that the Classic Maya had boats and paddles, but there is no evidence of sails (McKillop 2002). Their settlement of offshore islands also indicates the use of boats. Overland transportation was by trails and sacbes (limestone roadways). Human porters, sometimes slaves, were used to carry goods and resources. Technologically, the Maya had no domesticated draft animals and did not use the wheel, either for transportation or in the production of pottery vessels, which were produced by hand using the coil technique, in which long coils of clays were used to make pots whose surfaces were then smoothed by hand or tools.

The Maya were sophisticated artists and craftspeople whose skill was reflected in their pottery and chert stone tools and also in their organization and construction of temples and palaces. They displayed art publicly, from stone or stuccoed masks on temple façades and the brightly colored temples and other public architecture, to murals at Bonampak and cave paintings. Multicolored painted pots were typical of the Classic period, with ritual and historic themes of figures depicted on Late Classic vases, many of which also had hieroglyphic writing. Fancy pots were used in public feasting and in the ritual ceremonies of the royal Maya, with vessels for chocolate, tamales, and other foods depicted in scenes of court life on painted pots. Figures were also depicted on stone monument buildings and stelae, which, along with the hieroglyphs, were historical documents and public statements by the elite Maya. Stone carvings figured in architecture at some Classic cities, such as Yaxchilan, Mexico. There are artistic depictions of dancers and musicians on pottery vessels and actual musical instruments from Pacbitun and Lubaantun, Belize, and from other Maya sites (Miller 1986; Reents-Budet 1994).

The Classic Maya had a hieroglyphic writing system that is preserved on stelae and other carved monuments, on pottery vessels, and on stone carvings. The writing was used to record historical information about the royal Maya and to describe important rituals, but it was not about commerce and only incidentally about astronomy and mathematics as they were used in the calendars. The ability to read and write was evidently limited to the upper class, as hieroglyphs at some smaller communities were decorative but not real glyphs, indicating that the medium was the message (Coe and Van Stone 2001; Matthews 2003a; Montgomery 2002a; Montgomery 2002b).

The Maya had a complex mathematical system involving the advanced concept of zero, and they had a complicated calendrical system. They had two time cycles based on multiples of twenty that intersected every fifty-two years to form the calendar round. The beginning of the Maya calendar corresponds to the year 3114 B.C. in the Christian calendar. Archaeologists develop chronologies of the Maya by reference to the dated stelae and also from study of the changing styles of pottery vessels from excavations. Generally, red-painted pots are characteristic of the Preclassic period, polychrome pottery is typical of the Classic period, and carved or incised decoration is typical of the Postclassic period.

The Maya had a pantheon of gods, but the Maya king or queen was the paramount ritual figure. Fasting, bloodletting, tobacco smoking, and taking ritual enemas were part of vision quests carried out by the royal Maya at important state events—notably accession to the throne, marriage, the birth of a child, and death. Bloodletting was done with a stingray spine or obsidian blade piercing the tongue, penis, or other soft body part. The public display of royal Maya bloodletting and other rituals is shown on stelae, other stone carvings, and on painted pots.

Postclassic Period

One by one, the Late Classic cities in the southern Maya lowlands were abandoned. The collapse may have been precipitated by overpopulation and by ecological disasters brought on by extensive clearing of the rainforest and overuse of the land for agriculture. Climatic or other environmental changes made have also contributed to the ecological problems. Certainly, warfare was endemic among the lowland city-states, and some archaeologists contend that it was what caused the collapse. The downfall of cities was recorded on stelae at the conquering city. By A.D. 900, most of the important Classic period cities in the southern Maya lowlands were abandoned. Rural farmers and small communities continued, but there was also significant depopulation in the rural area of the southern Maya. However, there is no skeletal evidence of disease decimating the population or of bodies strewn in the streets or in hastily made graves, as would have resulted from disease or large-scale warfare. What happened to the Classic Maya people when the political-economic fabric of the dynastic Maya disintegrated? Was there a mass exodus out of the southern lowlands? Certainly there was continued settlement, even an increase in population, to the east in parts of Belize and in the northern Maya lowlands. A



Stela P at Copan, front view showing royal figure
(Courtesy B. Somers)



Stela P at Copan, side view showing hieroglyphic text
(Courtesy B. Somers)

few cities in the southern Maya lowlands, such as Lamanai in Belize, continued during the subsequent Postclassic period (A.D. 900–1500). Chichen Itza and later Mayapan rose to prominence in the Postclassic in the northern Maya lowlands. Population dynamics at the end of the Classic period in the Maya lowlands remain a pressing unresolved issue.

Still, important strides have been made since John Lloyd Stephens explored ancient Maya cities in the mid-nineteenth century. Old views of the empty ceremonial center supported by rural slash-and-burn farmers have been replaced by new views of densely populated cities supported, in part, by more intensive agriculture. Reasons for the collapse of the civilization still focus on ecological and demographic problems, but the roles of warfare and climatic change are now considered as viable alternatives. Once considered a peaceful people, the Classic Maya as revealed through the decipherment of the hieroglyphs were shown to be quite bellicose. Current examinations of the nature of craft production and the trade of salt, obsidian, chert, and other materials will enhance our knowledge of the Classic Maya economic and political structure.

SOURCES OF INFORMATION ON THE MAYA

Journals

Ancient Mesoamerica and *Latin American Antiquity* are the premier journals that have a significant focus on Maya archaeology, but many other leading archaeology journals carry articles on the ancient Maya. *Journal of Field Archaeology* publishes reports of fieldwork and analysis and has a Web page providing an alphabetical listing of articles on the Maya by author under the category “Mesoamerica,” at <http://jfa-www.bu.edu/Indices/MesoAm.html>. *Mexicon* is a good source of recent research. It also lists recent journal articles and books that focus on Mesoamerica, including the Maya. Their Web page (<http://www.mexicon.de>) has an index of articles arranged by author, including some articles with abstracts.

Other major journals that often include articles on Maya archaeology include *Journal of Archaeological Science*, *World Archaeology*, *Archaeology*, *Science*, *Nature*, *Journal of World Prehistory*, *American Anthropologist*, *Current Anthropology*, *Antiquity*, *Journal of Anthropological Research*, and *Cambridge Archaeological Journal*. *Antiquity* has an index by subject and author of articles in their journal (<http://antiquity.ac.uk/Listing/listingindex.html>), as well as the table of contents of recent journal issues. *Archaeology* magazine (<http://www.archaeology.org>) has an index of articles by author, with abstracts from 1991 to the present, as well as an archive of articles from 1996 to 2001 (<http://www.archaeology.org/index/msubject.html>). The *PARI Journal* provides important recent articles on hieroglyphs, as well as articles on the Maya city of Palenque and other Maya research, with information also being provided on their Web page (<http://www.mesoweb.com/pari>).

Increasingly, entire journal articles are available on the Internet, either by a per-article fee, or gratis to students and faculty at universities, for example. Ingenta, an electronic source, provides overnight delivery of articles from thousands of journals (<http://www.ingenta.com>). JStor, another electronic source, provides electronic access to the full text of articles from *American Antiquity*, *Latin American Antiquity*, *World Archaeology*, *Current Anthropology*, and *Annual Review of Anthropology*, although not the most recent issues. Importantly, both JStor and Ingenta can be used without charge as online search engines.

by topic or by viewing the table of contents of each issue. Members of the Society of American Archaeology, which publishes *American Antiquity* and *Latin American Antiquity*, can subscribe to JStor for a modest annual fee (<http://www.jstor.org>).

Books

The University of Texas Press, University Press of Florida, University of Oklahoma Press, Thames & Hudson, and University of Utah Press publish general texts on the Maya, edited volumes, and other books on the ancient Maya. For more suggested reading on the Maya, see the Resources for Further Study section at the end of this book.

- Andrews, E. Wyllys, IV, and E. Wyllys Andrews V. 1980. *Excavations at Dzibilchaltun, Yucatan, Mexico*. Middle American Research Institute Publication 48. New Orleans: Tulane University.
- Ashmore, Wendy, ed. 1981. *Lowland Maya Settlement Patterns*. Albuquerque: University of New Mexico Press.
- Chase, Arlen F., and Prudence M. Rice, eds. 1985. *The Lowland Maya Postclassic*. Austin: University of Texas Press.
- Clancy, Flora F., and Peter D. Harrison, eds. 1990. *Vision and Revision in Maya Studies*. Albuquerque: University of New Mexico Press.
- Culbert, T. Patrick, ed. 1973. *The Classic Maya Collapse*. Albuquerque: University of New Mexico Press.
- . 1991. *Classic Maya Political History*. New York: Cambridge University Press.
- Culbert, T. Patrick, and Don S. Rice, eds. 1990. *Precolumbian Population History in the Maya Lowlands*. Albuquerque: University of New Mexico Press.
- Ford, Anabel. 1986. *Population Growth and Social Complexity: An Examination of Settlement and Environment in the Central Maya Lowlands*. Anthropological Research Paper 35. Tempe: Arizona State University.
- Freidel, David A., and Jeremy A. Sabloff. 1984. *Cozumel: Late Maya Settlement Patterns*. New York: Academic Press.
- Hammond, Norman. 1975. *Lubaantun: A Classic Maya Realm*. Peabody Museum of Archaeology and Ethnology Monograph, vol. 2. Cambridge, MA: Harvard University.
- Houston, Stephen D. 1993. *Hieroglyphs and History at Dos Pilas: Dynastic Politics of the Classic Maya*. Austin: University of Texas Press.
- Kurjack, Edward. 1974. *Prehistoric Lowland Maya Community and Social Organization: A Case Study at Dzibilchaltun, Yucatan, Mexico*. Middle American Research Institute Publication 38. New Orleans: Tulane University.
- Lowe, John W. G. 1985. *The Dynamics of Apocalypse: A Systems Simulation of the Classic Maya Collapse*. Albuquerque: University of New Mexico Press.
- Marcus, Joyce. 1976. *Emblem and State in the Classic Maya Lowlands*. Washington, DC: Dumbarton Oaks.
- Martin, Simon, and Nickolai Grube. 2000. *Chronicle of the Maya Kings and Queens*. New York: Thames & Hudson.
- Masson, Marilyn, and David Freidel, eds. 2002. *Ancient Maya Political Economies*. New York: Altamira.
- McAnany, Patricia A., and Barry Isaac, eds. 1989. *Prehistoric Maya Economies of Belize*. Research in Economic Anthropology Supplement 4. Greenwich, CT: JAI Press.
- McKillop, Heather. 2002. *Salt: White Gold of the Ancient Maya*. Gainesville: University Press of Florida.
- Miller, Mary Ellen. 1986. *The Murals of Bonampak*. Princeton, NJ: Princeton University Press.

Morley, Sylvanus G. 1946. *The Ancient Maya*. Palo Alto, CA: Stanford University Press.

Sabloff, Jeremy A., and E. Wyllys Andrews V, eds. 1986. *Late Lowland Maya Civilization: Classic to Postclassic*. Albuquerque: University of New Mexico Press.

Sabloff, Jeremy A., and John S. Henderson, eds. 1993. *Lowland Maya Civilization in the Eighth Century A.D.* Washington, DC: Dumbarton Oaks Research Library and Collection.

Schlesinger, Victoria. 2001. *Animals and Plants of the Ancient Maya: A Guide*. Austin: University of Texas Press.

Sheets, Payson, ed. 2002. *Before the Volcano Erupted: The Ancient Ceren Village in Central America*. Austin: University of Texas Press.

White, Christine D., ed. 1999. *Reconstructing Ancient Maya Diet*. Salt Lake City: University of Utah Press.

Monographs

Monograph series that focus on the ancient Maya include *Papers (and Memoirs) of the Peabody Museum of Archaeology and Ethnology* published by Harvard University, *Middle American Research Institute Papers* of Tulane University, the Tikal reports and other Maya monographs published by the University of Pennsylvania Museum, Vanderbilt University's series on the Petexbatun project, and the Royal Ontario Museum on Altun Ha and other sites. The University of Texas Press, the University Press of Florida in their Maya Studies series, the Pre-Columbian Art Research Institute (PARI), and Thames & Hudson have a focus on publishing Maya monographs. Monographs also are published by other universities, museums, and private publishers.

CDs and Videos

UCSB Maya Forest GIS 2000 by Anabel Ford and Keith Clarke includes maps and satellite imagery for the Peten, Guatemala, and upper Belize River area corresponding to Ford's research. Ford's (2003) *Welcome to El Pilar* CD describes the El Pilar Archaeological Reserve for Maya Flora and Fauna. *Mesolore: Exploring Mesoamerican Culture* (Bakewell and Hammann 2001) includes discussion of the ancient Maya. The *Living Maya* CD explores the modern Mopan and Kekchi Maya of southern Belize (Marsden and Leupold 2001). Payson Sheets's CD on the Ceren site, *An Interactive Guide to Ancient Ceren: Before the Volcano Erupted*, contains field reports, illustrations, and data that are summarized in the text *Before the Volcano Erupted* (Sheets 2002). The CD is available on the Internet at <http://ceren.colorado.edu>. Merle Green Robertson's rubbings of Palenque stelae and other carved monuments can be downloaded for free from the Pre-Columbian Art Research Institute (PARI) at <http://www.mesoweb.com/pari>. Increasingly, electronic access to Maya archaeology is being provided on the Internet without charge.

Educational videos are available on the ancient Maya. *Lost Kingdoms of the Ancient Maya* (Weber 1993) includes interviews of Maya archaeologists at Copan, Caracol, Dos Pilas, and other Classic Maya sites in the 1990s. *Lost King of the Maya* (Glassman 2001) explores the life of Yax K'uk Mo, the first king of the Copan dynasty, a Classic Maya polity in western Honduras. An earlier video, *Maya: Lords of the Jungle*, provides an informative discussion of population increase and methods of intensifying agricultural production during the Late Classic, with interviews of Maya archaeologists (Ambrosino 1993).

Research Programs

Research programs focusing on Maya archaeology and involving fieldwork are offered

at many universities with Maya archaeologists, as well as through government agencies in several Central American countries. Maya research has been carried out for many years through several institutions, notably Harvard University, the University of Pennsylvania, and the Royal Ontario Museum. Beginning in the 1980s, there was a tremendous increase in the number of Maya archaeologists with field programs through their universities. Institutions developing programs at that time included Vanderbilt University, Southern Methodist University, the University of Arizona, Trent University, the University of Texas at Austin, the University of Texas at San Antonio, the University of Central Florida, and Southern Illinois University at Carbondale. By 2000, there were many more universities with active field programs in Maya archaeology.

Many of the current and ongoing projects involve opportunities for university students to participate, and some projects allow volunteers to participate. Many projects permit visitors, so public knowledge of “who is digging where” is useful to those interested in participating in or visiting Maya sites so that the project director may be contacted in advance. The Guatemalan government initiated excavation and restoration at Tikal, under the direction of Juan Valdez LaPorte, following the long-term University of Pennsylvania Museum project at the site. After a multiyear project in the Petexbatun region of the Peten, Guatemala, Arthur Demarest of Vanderbilt University initiated work at Cancuen, Guatemala. Several of Demarest’s former students who worked on the Petexbatun project have initiated their own fieldwork, including Antonia Foias at Motul de San Jose and Takeshi Inomata at Aguateca. Francisco Estrada-Belli began excavations at Holmul, where distinctive Protoclassic pottery had been reported decades earlier (Merwin and Vaillant 1932). Don and Prudence Rice have carried out fieldwork in the central Peten, Guatemala, through the University of Southern Illinois at Carbondale. Stephen Houston of Brigham Young University directs research at Piedras Negras, Guatemala, along with David Webster of Penn State University. Other projects include William Saturno’s research on the murals of San Bartolo and Richard Hansen’s research at the Preclassic cities of El Mirador and Nakbe through UCLA.

The Institute of Archaeology of the Belize government is occupied both with overseeing the many field projects by foreign archaeologists and in carrying out government-sponsored fieldwork. The Institute is part of the National Institute of Culture and History (<http://www.nichbelize.org>.) Belizean archaeologists Jaime Awe and Allan Moore initiated an excavation and restoration project at Caracol and other public sites in Belize funded by the Inter-American Development Bank to develop ancient sites for tourism, which is a major focus of the Belize government for archaeological research in their country. This follows Awe’s earlier work in Belizean caves through the University of New Hampshire and Trent University, and at Cahal Pech through Trent University and the University of London. Allan Moore’s previous research was at Baking Pot through the University of London. Both Awe and Moore studied at Trent University under Paul Healy, who had projects on terraces in the Maya Mountains and at Pacbitun. Elizabeth Graham has ongoing research at Lamanai through the Institute of Archaeology at the University of London, England, continuing research done by David Pendergast, retired from the Royal Ontario Museum. Boston University has a Maya research program, with Norman Hammond doing research at La Milpa (following earlier work at Cuello, Nohmul, and Lubaantun) and Patricia McNally doing a project along the Sibun River (following earlier work at K’axob near Pulltrouser Swamp).

Others working in Belize include Diane and Arlen Chase of the University of Central Florida, who have carried out a long-term project at Caracol, following earlier work at Santa Rita Corozal, Belize. The author of this book has a long-term research program on



Archaeological research programs in the Maya area

the coast and cays of southern Belize (Port Honduras Marine Reserve and Paynes Creek National Park) through Louisiana State University, following earlier work at Moho Cay, Wild Cane Cay, and Frenchman's Cay. The Program for Belize, directed by Fred Valdez of the University of Texas, Austin, includes a variety of research efforts by many archaeologists in northwestern Belize. Other major research programs in Belize include K. Anne Pyburn's excavations at Chau Hiix through Indiana University (following her earlier work at Nohmul and on Albion Island); Anabel Ford's project at El Pilar, following her earlier work along the Belize River (both through the University of California at Santa Barbara); Joe Ball's project at Cahal Pech and nearby sites through San Diego State University; Marilyn Masson's project in northern Belize through SUNY, Albany; Shirley Mock's study of northern coastal Belize through the University of Texas at San Antonio; Jon Lohse's project at Blue Creek (following Thomas Guderjan's research); Geoffrey Braswell's project at Pusilha through SUNY, Buffalo; and Peter Dunham's Maya Mountain research through Cleveland State University.

Other multiyear projects ended in the late twentieth century, including Thomas Hester and Harry Shafer's projects at Colha through the University of Texas at Austin and Texas A & M University, respectively; Richard Leventhal and Wendy Ashmore's project at Xunantunich through UCLA and UC, Riverside (following Leventhal's previous work at Nim li punit, Pusilha, and elsewhere in southern Belize).

The Institute of Anthropology and History (INAH) in Mexico carries out excavation and restoration projects and also oversees research programs directed by foreign archaeologists; these must have a Mexican co-director. A research program directed by George Bey of Millsap's College and Bill Ringle of Davidson College focused on Ek Balam and other sites in the Yucatan. Rani Alexander has directed a rare historical archaeology project in the Yucatan, with continuing work at Isla Ciltvik through New Mexico State University. Other recent projects include Marilyn Masson's project at Mayapan, Bruce Dahlin and Traci Ardren's project at Chunchucmil, Michael Smyth's excavations at Chac, Anthony Andrews's research on the Yucatan coast, and Terance Winemiller's study of water resources at ancient Maya sites in the northern Maya lowlands. The Mexican government itself continues excavation and restoration of architecture at a number of sites, notably Peter Schmidt's project at Chichen Itza.

Several universities have been involved in research at Copan, Honduras. Bill Fash of Harvard University, David Webster and William T. Sanders of Penn State, Robert Sharer of the University of Pennsylvania, and E. Wyllys Andrews V of Tulane University have directed recent projects. Elsewhere in Honduras, Rosemary Joyce of the University of California at Berkeley, John Henderson, and others are carrying out ongoing fieldwork.

In El Salvador, Payson Sheets of the University of Colorado at Boulder has carried out research since the 1970s at the Ceren site. Elsewhere in El Salvador, Jane Kelly, Bill Fowler, and E. Wyllys Andrews V also have carried out fieldwork in recent years.

Several institutions host regular events focusing on Maya archaeology that are open to the public. The Maya Weekend, held each spring at the University of Pennsylvania Museum, hosts a series of speakers. A similar Maya weekend has been offered at UCLA in the fall. Beginning in 2002, Tulane University's Middle American Research Institute initiated a Maya weekend during the fall. The Maya Hieroglyph Workshop at the University of Texas, Austin, initiated by the late Linda Schele, is offered annually in March for a week and focuses on learning and interpreting Maya glyphs. Louisiana State University has offered LSU Maya Archaeology Night in early November, highlighting student research in Maya archaeology for a public audience (http://www.ga.lsu.edu/Maya_Night.htm).

Dumbarton Oaks in Washington, D.C. (<http://www.doaks.org>), and the School for American Research in Santa Fe, New Mexico (<http://www.sarweb.org>) periodically host seminars on Maya archaeology, with the Dumbarton Oaks event open to the public.

A number of exhibitions of Maya pottery and other objects in recent years have produced publications. E. Michael Whittington (2001) organized the exhibit *The Sport of Life and Death: The Mesoamerican Ball Game* in 2002 at the Mint Museum of Art in Charlotte, North Carolina, the New Orleans Museum of Art, the Joslyn Art Museum in Omaha, Nebraska, and the Newark Museum, in New Jersey, in 2001–2002. The exhibit entitled *Maya*, with a lavishly illustrated book edited by Peter Schmidt, Mercedes de la Garza, and Enrique Nalda (1998), was held in Venice, Italy. *Painting the Maya Universe: Royal Ceramics of the Classic Period* by Dorie Reents-Budet (1994) accompanied an exhibit at the Duke Museum of Art, the Museum of Fine Arts in Boston, the Denver Art Museum, the Los Angeles County Museum, and Yale University Art Gallery in 1994 and 1995. *The Blood of Kings: Dynasty and Ritual in Maya Art* by Linda Schele and Mary Miller (1986) accompanied an exhibit at the Kimbell Art Museum in Fort Worth, Texas, and the Cleveland Museum of Art in 1986. The book *Cenote of Sacrifice: Maya Treasures from the Sacred Well at Chichen Itza* (Coggins and Shane 1984) was a joint venture by the Science Museum of Minnesota and Harvard's Peabody Museum. Other recent exhibits include *Maya: Treasures of an Ancient Civilization* (with a book by the same name written by Clancy et al. 1985), which toured the American Museum of Natural History, the Los Angeles County Museum, the Dallas Museum of Art, the Royal Ontario Museum, Nelson-Atkins Museum of Art in Kansas City, and the Albuquerque Museum from 1985 to 1987. Diane and Arlen Chase had exhibits on Caracol (with a book by Chase and Chase 1987) and Santa Rita Corozal (with a book by Chase and Chase 1986) at the Orlando Museum of Art. Michael Coe has organized several important exhibitions of Maya art with well-illustrated catalogs (Coe 1973; Coe 1978; Coe 1982).

Internet

Perhaps the best Maya archaeology Web pages are those created by the archaeologists (or in consultation with them) about their fieldwork. There are other informative websites that provide more general information on the ancient Maya, including useful information on how modern people can travel to see Maya sites. Some websites are valuable resources for research, as they include reports and illustrations. For example, Diane and Arlen Chase created the website <http://www.caracol.org> about their project at Caracol. The site includes background on Caracol, field season summaries, photos, and information on publications. The site also has journals from the archaeologists and their children, plus fun Maya games for kids to play. Anabel Ford's website on El Pilar (<http://www.marc.ucsb.edu/elpilar/>) provides sophisticated computer illustrations, other informative illustrations, and text on her successful efforts to create a binational park at El Pilar, which straddles the border between Belize and Guatemala.

Payson Sheets's excavations at El Ceren, an ancient Maya community in El Salvador buried by a volcanic eruption, are highlighted in his Web page at <http://ceren.colorado.edu>. The site provides stunning graphics. Rani Alexander's excavations at Isla Civituk, an island off the west coast of the Yucatan peninsula, Mexico, are well documented in her website at <http://www.nmsu.edu/~anthro/islacivilituk/ICmast.html>. The LSU Maya Archaeology website (http://www.ga.lsu.edu/Maya_Night.html) includes descriptions, photos, and newsletters about this author's own fieldwork at Wild Cane Cay, Frenchman's Cay, Punta Ycacos Lagoon, and elsewhere in the Port

Honduras Marine Reserve and Paynes Creek National Park in southern Belize. Research at Lamanai, Altun Ha, and Marco Gonzalez in northern Belize by David Pendergast and Elizabeth Graham is detailed at <http://www.rom.on.ca/digs/belize.html/>. Much of the site highlights Lamanai (<http://www.rom.on.ca/digs/belize/what-we-know.html>), with a section on the history of excavations and a wonderful summary of the research. Patricia McNany's fieldwork at the Maya community of K'axob by Pulltrouser Swamp in northern Belize and at Xibun along the Sibun River in central Belize is presented in her Web page, <http://www.bu.edu/tricia/>. The Programme for Belize Archaeological Project in northwestern Belize directed by Fred Valdez includes description of the fieldwork (<http://uts.cc.utexas.edu/~marl/>), as well as a new digital journal on Maya and Texas prehistory, *Mono y Conejo: Journal of the Mesoamerican Archaeological Research Laboratory*, with volume 1 published in 2003 on the Internet and downloadable for free (http://uts.cc.utexas.edu/~marl/Publications/mono_y_conejo.htm). Sophisticated computer mapping using geographic information system (GIS) software maps by Francisco Estrada-Belli, as well as informative reports, are on the La Milpa website at <http://www.bu.edu/lamilpa>. A status report on Tom Hester and Harry Shafer's Colha Preceramic Project is available at <http://www.utexas.edu/cola/lilas/centers/publications/papers/latinamerica/9503.html>. Bill and Barbara Fash present some of their research findings at Copan, Honduras, in their Web page, <http://www.peabody.harvard.edu/profiles/fash.html>. Marilyn Masson's website at <http://www.albany.edu/anthro/fac/masson.htm> is mainly about the field school in northern Belize. Jaime Awe's Western Belize Cave Project includes video tours and other information (<http://www.indiana.edu/~belize/>; see also <http://www.bvar.org>).

The governments of Belize, Guatemala, Mexico, Honduras, and El Salvador provide information on Maya archaeology in their countries. In Mexico, the Instituto Nacional de Antropología e Historia (INAH) is in charge of Maya archaeology, and you can find information at <http://www.inah.gob.mx>. The Tikal website (<http://www.tikalpark.com>) includes the site map, general information about the ruins, history of research, flora, fauna, and photographs.

In the late twentieth century, the Belize government initiated a program to develop museums, launched with the Belize Museum in Belize City, the Museum in Belmopan, and overall management of cultural and archaeological development through the National Institute of Culture and History (NICH). The Belize government's Institute of Archaeology in Belmopan provides tours of their collections and houses an outstanding research library.

The Foundation for Mesoamerican Research, Inc. (FAMSI) is the main source for Justin Kerr's (2003a, 2003b) fabulous "rollouts" of Maya vases and other pottery that provide a full photo of the painted decoration on a pottery vessel using a special photographic technique he developed. The FAMSI website also includes research reports from FAMSI grants at <http://www.famsi.org>. Their online "research facility" is an important source of primary information for students and researchers, who can search by word or phrase through the combined Kerr portfolio (2003a); John Montgomery hieroglyph dictionary, including Maya speakers pronouncing the words (Matthews 2003a); and Linda Schele drawing archive (Matthews 2003b; <http://www.famsi.org/search.htm>). The FAMSI website makes it possible to carry out original research utilizing the Web data, thereby marking an important turning point in the use of the Internet. Additionally, FAMSI hosts the ongoing Mesoamerican bibliography project, which is a joint project with John Weeks (2003) of the University of Pennsylvania and is founded on the thousands of sources compiled by Ignacio Bernal. The FAMSI website also hosts the

University of Pennsylvania Museum's Tikal Digital Access Project (Mesdia 2003) providing data on the project. FAMSI also maintains an up-to-date listing of Maya-related events (<http://www.famsi.org/events/htm>) and continues to add new information, such as a photographic database of Stephen Houston's 1997–2000 fieldwork at Piedras Negras (http://www.famsi.org/research/piedras_negras.htm).

Pre-Columbian Studies at Dumbarton Oaks also has useful online material and information for Maya archaeology, including an online tour of their Maya gallery (<http://www.doaks.org/Pre-Columbian.html/>). Maya pots, including rollouts, are shown on their "slide sets" listing. The Dumbarton Oaks website also lists conferences and other activities on Maya archaeology, as well as an important online library catalog of Maya books and articles in their collections. Tulane University's Middle American Research Institute provides a listing of their collections <http://www.tulane.edu/~mari/collect.html>, as well as of their publication series <http://www.tulane.edu/~mari/pubmenu.html>.

There are several excellent websites on Mayan hieroglyphs, calendars, astronomy, and related topics in addition to John Montgomery's (Matthews 2003a) digital dictionary, which includes sound. The Maya astronomy page (<http://www.michiellb.nl/maya/>) provides very useful information on Maya mathematics, calendars, hieroglyphic writing, and astronomy. The Mayan Epigraphic Database Project (<http://www.iath.virginia.edu/med/>) provides a stellar glyph catalog for the serious researcher, as well as other information for researchers and for novice Maya hieroglyph aficionados. David Stuart of Harvard's Peabody Museum provides an outstanding introduction to the hieroglyphs and history at Copan <http://www.peabody.harvard.edu/Copan/text.html>.

The Mesoamerican ball game website is a sophisticated companion to the exhibit of the same name (<http://www.ballgame.org/main.asp>). The companion website to the National Geographic Society video *Lost Kingdoms of the Maya* (Weber 1993; <http://www.pbs.org/wgbh/nova/maya>) includes detailed information on the ancient Maya under "Tour Copan with David Stuart," "Incidents of Travel," "Map of Maya World" (which has a clickable map with information on fifteen Maya sites), and "Reading Maya Hieroglyphs." They are available in video format or as a transcript online. National Geographic provides information on the ancient Maya (<http://www.nationalgeographic.com>), including, for example, field reports such as the one from Jaime Awe's cave research in Belize (<http://www.nationalgeographic.com/chiquibul/intro.html>). Information on many Maya sites in Belize is available at <http://www.ambergriscaye.com/pages/mayan/mayasites.html>. Links to Maya archaeology websites in Belize are available through the website <http://archaeology.about.com/blbelize.htm>. A valuable website for researchers and travelers interested in Spanish colonial sites in the Yucatan is <http://www.colonial-mexico.com>, published by Richard Perry. The website has selected Yucatecan monasteries, churches, and other Spanish colonial monuments, with a focus on the art and architecture as well as links to related websites. Information about Maya sites and Maya archaeology is widely available from many other websites, but the viewer must exercise judgment about the scientific quality of secondary sources not prepared by Maya archaeologists.

Field Schools

There are opportunities for students and volunteers to participate in excavations at Maya sites as part of archaeological field schools offered through universities with Maya archaeologists, through various volunteer organizations, or as part of a research

team (although this last is normally for students registered in academic programs). Maya archaeologists have offered field schools through university departments of anthropology (University of Texas, Austin, Trent University, Southwest Texas State University, UC Riverside, Louisiana State University) and departments of archaeology (Boston University). Earthwatch (<http://www.earthwatch.org>), University of California Research Expeditions or UREP (<http://extension.ucdavis.edu/urep/>), and the Maya Research Program (<http://www.mayaresearchprogram.org>) provide opportunities for volunteers to participate in fieldwork at Maya sites.

REFERENCES

- Ambrosino, Michael, prod. [1981] 1993. *Maya: Lords of the Jungle*. VHS video, PBS Home Video. Los Angeles: The Pacific Arts Corporation.
- Ardren, Traci, ed. 2002. *Ancient Maya Women*. Walnut Creek, CA: Altamira.
- Bakewell, Liza, and Byron Hammann. 2001. *Mesolore: Exploring Mesoamerican Culture*. Version 2.0. CD. Providence, RI: Brown University.
- Chase, Arlen F., and Diane Z. Chase. 1987. *Glimmers of a Forgotten Realm: Maya Archaeology at Caracol, Belize*. Orlando: Orlando Museum of Art and Loch Haven.
- Chase, Diane Z., and Arlen F. Chase. 1986. *Offerings to the Gods: Maya Archaeology at Santa Rita Corozal*. Orlando: University of Central Florida.
- Clancy, Flora S., Clemency C. Coggins, T. Patrick Culbert, Charles Gallenkamp, Peter D. Harrison, and Jeremy A. Sabloff. 1985. *Maya: Treasures of an Ancient Civilization*. New York: Harry N. Abrams.
- Coe, Michael D. 1973. *The Maya Scribe and His World*. New York: Grolier Club.
- . 1978. *Lords of the Underworld: Masterpieces of Classic Maya Ceramics*. Princeton, NJ: Art Museum, Princeton University, and Princeton University Press.
- . 1982. *Old Gods and Young Heroes: The Pearlman Collection of Maya Ceramics*. Jerusalem: Israel Museum.
- Coe, Michael D., and Mark Van Stone. 2001. *Reading the Maya Glyphs*. New York: Thames & Hudson.
- Coggins, Clemency, and Orrin C. Shane III, eds. 1984. *Cenote of Sacrifice: Maya Treasures from the Sacred Well at Chichen Itza*. Austin: University of Texas Press.
- Culbert, T. Patrick, ed. 1973. *The Classic Maya Collapse*. Albuquerque: University of New Mexico Press.
- Danforth, Marie. 1999. "Coming up Short: Stature and Nutrition among the Ancient Maya of the Southern Lowlands." In *Reconstructing Ancient Maya Diet*, edited by Christine White, 103–117. Salt Lake City: University of Utah Press.
- Demarest, Arthur. 1997. "The Vanderbilt Petexbatun Regional Archaeological Project 1989–1994: Overview, History, and Major Results of a Multidisciplinary Study of the Classic Maya Collapse." *Ancient Mesoamerica* 8: 209–227.
- Ford, Anabel. 2003. *Welcome to El Pilar: Come Explore the Trails of the El Pilar Archaeological Reserve for Maya Flora and Fauna*. CD. Santa Barbara: University of California at Santa Barbara.
- Ford, Anabel, and Keith Clark. 2000. *UCSB Maya Forest GIS 2000*. Santa Barbara: University of California at Santa Barbara.
- Freidel, David, Linda Schele, and Joy Parker. 1993. *Maya Cosmos*. New York: Morrow.
- Gill, Richardson. 2000. *The Great Maya Droughts: Water, Life, and Death*. Albuquerque: University of New Mexico Press.

- Graham, Elizabeth. 1987. "Resource Diversity in Belize and Its Implications for Models of Lowland Trade." *American Antiquity* 52 (4): 753–767.
- Hammond, Norman. 1972. "Obsidian Trade Routes in the Mayan Area." *Science* 178: 1092–1093.
- . ed. 1991. *Cuello*. New York: Cambridge University Press.
- Harrison, Peter D. 1999. *The Lords of Tikal*. New York: Thames & Hudson.
- Harrison, Peter D., and B. L. Turner, eds. 1978. *Pre-Hispanic Maya Agriculture*. Albuquerque: University of New Mexico Press.
- Haviland, William A. 1967. "Stature at Tikal, Guatemala: Implications for Ancient Maya Demography and Social Organization." *American Antiquity* 32: 117–125.
- Healy, Paul F., Heather I. McKillop, and Bernetta Walsh. 1984. "Analysis of Obsidian from Moho Cay, Belize: New Evidence on Classic Maya Trade Routes." *Science* 225: 414–417.
- Hodell, David A., Jason H. Curtis, and Mark Brenner. 1995. "Possible Role of Climate in the Collapse of Classic Maya Civilization." *Nature* 375: 391–394.
- Houston, Stephen, Oswaldo Chinchilla Mazariegos, and David Stuart, eds. 2001. *The Decipherment of Ancient Maya Writing*. Norman: University of Oklahoma Press.
- Kerr, Justin. 2003a. *Maya Vase Data Base: An Archive of Rollout Photographs Created by Justin Kerr*. <http://www.mayavase.com>.
- . 2003b. *The Grolier Codex*. <http://www.mayavase.com/grol/grolier.html>.
- Knorozov, Yuri V. 1958. "The Problem of the Study of Maya Hieroglyphic Writing" (translated by Sophie Coe). *American Antiquity* 23: 284–291.
- Marsden, Anne-Michelle, and Eric Leupold. 2001. *The Living Maya*. Punta Gorda, Belize: Maya Viewkeeper.
- Martin, Simon, and Nikolai Grube. 2000. *Chronicle of the Maya Kings and Queens*. New York: Thames & Hudson.
- Masson, Marilyn, and David Freidel, eds. 2002. *Ancient Maya Political Economies*. New York: Altamira.
- Matthews, Peter. 2003a. John Montgomery's *Dictionary of Maya Hieroglyphs*. <http://www.famsi.org/mayawriting/dictionary/montgomery/index.html>.
- . 2003b. *The Linda Schele Drawings*. <http://www.famsi.org/research/schele/bypmathews.htm>.
- McKillop, Heather. 1994. "Ancient Maya Tree Cropping: A Viable Subsistence Adaptation for the Island Maya." *Ancient Mesoamerica* 5: 129–140.
- . 2002. *Salt: White Gold of the Ancient Maya*. Gainesville: University Press of Florida.
- . 2003. "Catastrophic and Other Environmental Factors in the Classic Maya Collapse." Paper presented at the annual meeting of the American Association of Geographers, New Orleans, March.
- McKillop, Heather, L. J. Jackson, Helen Michel, Fred Stross, and Frank Asaro. 1988. "Chemical Sources Analysis of Maya Obsidian Artifacts: New Perspectives from Wild Cane Cay, Belize." In *Archaeometry* 88, edited by R. M. Farquhar, R. G. V. Hancock, and Larry A. Pavlish, 239–244. Toronto: Department of Physics, University of Toronto.
- Meggess, Betty. 1954. "Environmental Limitation on the Development of Culture." *American Anthropologist* 56: 801–824.
- Merwin, Raymond E., and George C. Vaillant. 1932. "The Ruins of Holmul, Guatemala." In *Memoirs of the Peabody Museum of Archaeology and Ethnology*. Cambridge, MA: Harvard University.

- Mesdia, Sharon. 2003. The Tikal Digital Access Project. <http://www.museum.upenn.edu/tdap/>. For part of the digital project data, see also <http://www.famsi.org/research/tikal/index.html>.
- Milbrath, Susan. 1999. *Star Gods of the Maya: Astronomy in Art, Folklore, and Calendars*. Austin: University of Texas Press.
- Miller, Mary. 1986. *The Murals of Bonampak*. Princeton, NJ: Princeton University Press.
- Montgomery, John. 2002a. *How to Read Maya Hieroglyphs*. New York: Hippocrene.
- . 2002b. *Dictionary of Maya Hieroglyphs*. New York: Hippocrene.
- Morley, Sylvanus. 1946. *The Ancient Maya*. Palo Alto, CA: Stanford University Press.
- Nelson, Fred W. 1985. "Summary of the Results of Analysis of Obsidian Artifacts from the Maya Lowlands." *Scanning Electron Microscopy* 2: 631–649.
- Proskouriakoff, Tatiana. 1960. "Historical Implications of a Pattern of Dates at Piedras Negras, Guatemala." *American Antiquity* 25: 454–475.
- Reents-Budet, Dorie. 1994. *Painting the Maya Universe*. Durham, NC: Duke University Press.
- Schele, Linda, and Mary Miller. 1986. *The Blood of Kings: Dynasty and Ritual in Maya Art*. New York: George Braziller.
- Schmidt, Peter, Mercedes de la Garza, and Enrique Nalda, eds. 1998. *Maya*. Venice: Bompiani.
- Stephens, John L. [1841] 1969. *Incidents of Travel in Central America, Chiapas, and Yucatan*. New York: Dover.
- Tedlock, Dennis, trans. 1985. *Popol Vuh: The Definitive Edition of the Mayan Book of the Dawn of Life and the Glories of Gods and Kings*. New York: Simon and Schuster.
- Thompson, J. Eric S. 1970. *Maya History and Religion*. Norman: University of Oklahoma Press.
- Weber, Christie. 1993. *Lost Kingdoms of the Maya*. VHS. Washington, DC: National Geographic Society.
- Webster, David. 2002. *The Fall of the Ancient Maya*. New York: Thames & Hudson.
- Weeks, John. 2003. *Bibliografia Mesoamericana*. <http://www.famsi.org/research/bibliography.htm>.
- White, Christine D., ed. 1999. *Reconstructing Ancient Maya Diet*. Salt Lake City: University of Utah Press.
- Whittington, E. Michael, ed. 2001. *The Sport of Life and Death: The Mesoamerican Ballgame*. New York: Thames & Hudson.

This page intentionally left blank

Part 2

Maya Civilization

This page intentionally left blank

2

Location of Maya Area and Environmental Setting

By definition, the Maya area includes the region where the ancient Maya civilization developed. This area consists of what is now Guatemala, Belize, El Salvador, the Yucatan peninsula and parts of adjacent Chiapas in Mexico, and western Honduras. According to historical linguist Lyle Campbell (1984), the Mayan language had developed in this area before 2100 B.C. The Maya of the Classic period civilization evidently spoke Cholan Mayan, which is close to modern Chorti, spoken by the Maya west of the ruins of Copan. Indigenous Maya people still live throughout much of the area, and many still speak one of the some thirty-one Mayan languages.

GENERAL NATURAL AND CULTURAL SUBDIVISIONS

Cultural Subareas

Archaeologists divide the Maya area into three subareas that reflect both environmental and cultural differences. The northern Maya lowlands are on the Yucatan peninsula. The southern Maya lowlands include Belize, the Peten district of Guatemala, and parts of adjacent Chiapas, Mexico, as well as the lowland area of Guatemala along the Motagua River and adjoining lowland Honduras. The southern Maya highlands are the mountainous region of southern Guatemala. The Classic period civilization developed in the southern Maya lowlands. Although there was early settlement in the northern Maya lowlands, it was not until the collapse of the southern lowland Maya cities after A.D. 900 that the northern lowlands flourished. Similarly, there was precocious early cultural development in the southern Maya highlands and also on the adjacent Pacific littoral, but the area remained in the cultural shadows of the southern lowland civilization.

Topography

Although evident on a gross scale, the topographic differences between the Maya highlands and lowlands often have been exaggerated. The Maya lowlands of the Yucatan peninsula of Mexico, of Belize, and of the Peten district of Guatemala are a limestone platform that is relatively flat. It looks particularly so being covered with the tropical rainforest vegetation of much of the southern Maya lowlands or the scrub vegetation of the northern Maya lowlands. From the top of a Maya temple, the panoramic view over the rainforest would