

DISCERNING MIGRATION IN THE ARCHAEOLOGICAL RECORD: A CASE STUDY AT
CHICHÉN ITZÁ

by

ANDREA B. SLUSSER
B.A. Northwestern University, 1975
J.D. Loyola University of Chicago School of Law, 1978

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Arts
in the Department of Anthropology
in the College of Sciences
at the University of Central Florida
Orlando, Florida

Fall Term
2008

© 2008 Andrea B. Slusser

ABSTRACT

Migration, as a theory to explain aspects in the archaeological record, has fallen out of favor in Mesoamerican archaeology, possibly due to a lack of a standard definition or description of migration. Migration as an explanation of change in Maya civilizations has been around since the 1950's and the culture-history era of American archaeology. Since the early 1990's, migration has been treated as a process, one that can be discerned in pre-literate cultures as well as historical ones. Models of the migration process are being developed and tested. One type of migration, elite dominance migration, is a particularly suitable process to study in Mesoamerica.

A model of elite dominance migration might include the following attributes: advance contact by the migrating culture, migration to a center, maintenance of contact with the sending population, spatial concentration of the incoming population, migration of a selected population of elites, and a cause or push factor. To find these attributes, the receiving population is studied to determine if there are multiple changes in the material record consistent with an intrusion of an outside group. And, there should be a rough chronological correlation between the sending and receiving populations

The Maya site of Chichén Itzá is a classic case study, and provides a starting point as a possible receiving population of an elite dominance migration. There is an abundance of scholarship devoted to the question of the relationship between Chichén Itzá and Tula, Hidalgo, in Central Mexico. The iconographic similarities between the two sites are numerous and have been thoroughly discussed in the literature. But, there is much more evidence that should be examined in applying a model of elite dominance, such as architecture, artifacts (including

ceramics and obsidian), burial and caching practices, and site configuration. Comparing all of these categories at the two sites, one reaches two conclusions: there are multiple lines of evidence for change in the material record across the spectrum of categories at Chichén Itzá, and, to a lesser extent, at Tula, Hidalgo, indicating a population intrusion. And, secondly, there are abundant similarities in architecture, caching practices, ceramics, and other aspects of the material record that support the assertion of strong contacts between the two sites.

Applying the model of elite dominance migration to Chichén Itzá, the majority of the markers for this type of migration can be seen in the material record of the site, as well as the site of Tula, Hidalgo. Chichén Itzá has the attributes of a receiving population, with an elite dominance migration of Central Mexican people taking place there, either from Tula, Hidalgo or from a third, as yet unspecified site that impacted both Chichén Itzá and Tula.

ACKNOWLEDGMENTS

The first thanks and acknowledgment belong to my advisor, Dr. Arlen F. Chase, for his support, professionalism, and encyclopedic knowledge of the archaeological literature. I would also like to extend my thanks to the other members of my thesis committee, Drs. Diane Z. Chase, John H. Walker, and Rafael Cobos Palma, for their encouragement and assistance.

In addition to the above-mentioned, I would like to thank Dr. David W. Anthony, Hartwick College, for his guidance on the immigration literature. And, Dr. George Stuart, Barndardsville, North Carolina, deserves thanks for his gracious hospitality and use of his library.

Finally, I would like to express my gratitude to my husband, David Slusser, for the years of encouragement and for being my reality check.

TABLE OF CONTENTS

LIST OF FIGURES	vii
LIST OF TABLES	viii
INTRODUCTION	1
Culture-History Approach	2
Beyond Culture-History	3
Migration as a Process	4
Elite Dominance Migration.....	6
LITERATURE REVIEW	10
Ethnohistory	10
Archaeological Investigations at Chichén Itzá	12
Iconography, Art, and Hieroglyphic Inscriptions at Chichén Itzá	14
Investigations at Tula, Hidalgo	15
Other Current Theories	16
DATA AND DISCUSSION	18
Architecture.....	18
Chichén Itzá - Overview	18
Tula - Overview	20
Discussion	22
Ceramics	26
Chichén Itzá	26
Tula	31
Discussion	34
Obsidian	36
Caches and Burial Offerings	38
Chichén Itzá	38
Tula	41
Discussion	42
Burials	43
Chichén Itzá	43
Tula	47
Discussion	49
Settlement and Dating.....	50
Chichén Itzá	50
Tula	53
Discussion	54
CONCLUSION.....	55
Future Research	63
APPENDIX A: FIGURES	66
APPENDIX B: COPYRIGHT PERMISSIONS	78
REFERENCES CITED.....	87

LIST OF FIGURES

Figure 1: Map of Maya Area - Relative Location of Chichen Itza (after Brown and Witschey, 2008)	67
Figure 2: Map of Mesoamerica Showing Location of Trade Centers and Obsidian Sources (drawn by L. Martindale Johnson, after Kepecs 2007:133).....	68
Figure 3: Map of the Epicenter of Chichen Itza (after Sharer and Traxler 2007, Fig. 9.29, Stanford University Press)	69
Figure 4: Map of Tula Grande (after Mastache et al 2002, Fig. 5.8, Colorado University Press) 70	70
Figure 5: Details of the Edificio 3 (Salas 1, 2, and 3), Pyramid (Edificio) B, and Vestibulos at Tula Grande (Diehl, 1989, Fig. 3.4, University of Iowa Press, after Acosta 1960, Fig. 1, INAH)	71
Figure 6: Plan of the Temple of the Warriors and Colonnades at Chichen Itza (Morris 1931, Pls. 3 and 3a, Carnegie Institution of Washington, D.C.).....	72
Figure 7: Map of the Gran Nivelación at Chichen Itza (after Ruppert 1943, Fig. 1, Carnegie Institution of Washington, D.C.).....	73
Figure 8: Grater Bowl, Chichen Slate (drawn by L. Martindale Johnson, after Brainerd 1958:Figure74h).....	74
Figure 9: Tollan Phase, Jara Polished Orange Tripod Dish (drawn by L. Martindale Johnson, after Acosta 1954:Figure 4.1)	75
Figure 10: Chichen Itza, cache inside limestone jar, Temple of the Chacmool (Morris et al 1931:Figure 119).....	76
Figure 11: Map Showing Possible Migration Routes (drawn by L. Martindale Johnson and A. Slusser, after Kepecs 2007:Figure 1)	77

LIST OF TABLES

Table 1: Sherd Distribution by Date (after Smith 1951:122, 173)	27
Table 2: Revised Ceramic Chronology, Chichen Itza (after Smith 1971:173; Schmidt 2007: 182; Cobos 2007:325-326).....	31
Table 3: Tula Ceramic Chronology (after Mastache, Cobean, and Healan 1990:43, 49).....	32

INTRODUCTION

Migration is a well-documented topic in cultural anthropology, but is less discussed in archaeology. Studying the movement of peoples presents special challenges in archaeology, particularly in prehistoric archaeology with its paucity of written records. Without written history to refer to, archaeologists are forced to rely exclusively on the components of the material record to infer movements of people and populations.

Migration can best be understood and described as a process, rather a short-hand explanation for change (people moved from Point A to Point B), like “disease” and “warfare”. A process looks at the beginning and endpoints, as well as what takes place in between. Models of migration can be developed and applied to specific locations in Mesoamerica. The Maya site of Chichén Itzá provides the starting point as a possible receiving population of a migration. There is an abundance of scholarship describing the connections between Chichén Itzá and Tula, Hidalgo, in Central Mexico. This study will develop a working migration model, and apply it to the sites of Tula and Chichén Itzá, as sending and receiving populations (respectively).

A useful migration model will look for certain attributes in the sending and receiving populations. To find these features, the receiving population (Chichén Itzá) will be studied to determine if there are multiple changes in the material record consistent with the intrusion of an outside group (the sending population, Tula). Both populations should demonstrate markers that are consistent with the model being tested. In order to develop a working definition of migration and useful models of migration that can be in archaeological contexts, it is necessary to briefly review the concept of migration in archaeology

Culture-History Approach

The earliest discussions of migration by archaeologists were grounded in concepts of culture. Gordon R. Willey and a panel of scholars met at Harvard University for a series of archaeological seminars in 1955 and formalized a culture history approach to archaeology grounded in “culture contact” and the intrusion or mixture of one culture’s elements into another culture. They classified different types of culture contact based on the presumed nature of the interaction and its results. Willey’s panel chose to look at those particular aspects because both the nature and the results of contact were believed to be directly observable, and because “*neither requires any explanation of the events leading up to the contact*” (italics mine), (Willey et al. 1956:7).

Intrusions were thought to be easy to identify once the chronology of two areas has been established: an element has intruded into an area if it is discrete and occurred at an earlier date in another area. The 1955 seminar’s scholars distinguished between two different types of intrusive elements, based on scale: site-units were homogenous occupations of one culture that appeared in another culture (Willey et al. 1956:7-8); trait-units were features or objects modified by humans with recognizable styles or attributes that can be identified with a specific culture, but which appeared in a second culture (Willey et al. 1956:8; see also Rouse (1958) and Haury (1958).

Bruce Trigger relied on the culture contact approach in 1968 when he defined migration as “the movement of peoples” and attempted to distinguish between migration and diffusion (Trigger 1968:28). Diffusion is the transfer of new ideas, or units of culture, from one person or group to another person or group (Trigger 1968:27). Migration can include cultural diffusion or

it can occur without diffusion, when the migrating population is completely assimilated by the resident population (Trigger 1968:28-29). For Trigger, “clear-cut evidence of diffusion or migration is frequently lacking in the archaeological record” (Trigger 1968:29). This dilemma caused archaeologists to turn away from migration for many years.

Beyond Culture-History

Trigger’s negative assessment was affirmed by many archaeologists, and migration fell out of favor as an explanation for changes in the archaeological record (Renfrew 1987:3; see also Adams, Van Gerven, and Levy 1977). The rehabilitation of the archaeological use of migration began with Irving Rouse, a member of the original Willey panel. Rouse argued that the “inference of migrations from the archaeological evidence is still a viable pursuit” (Rouse, 1986: xii). He described migration in cultural terms, proposing three hypotheses for cultural development: (1) migration; (2) local development; and (3) borrowing (Rouse 1986:2). Migration can be inferred from patterns of change in a culture’s norms (Rouse 1986:4).

Rouse described migration as a one-way population movement, which either replaced an existing population (population movement) or penetrated an existing population without replacing it (immigration) (Rouse 1986:13). Rouse distinguished migration from diffusion or trade by the nature of the change: a gradual change from one cultural complex to another is the result of contact between cultures, such as by trade or diffusion, while an abrupt change can be attributed to population movement or migration (Rouse 1986:11-12).

British archaeologist Colin Renfrew, in his 1987 work *Archaeology and Language*, examined linguistic change and development in prehistory. Like his predecessors, Renfrew defined migration as movement of a population, but he addressed it as a cause of linguistic

change (Renfrew 1987:121-122). Renfrew may be distinguished from the other three scholars insofar as he allowed for migration as an initial colonization as well as an intrusion into an already-populated area (Renfrew 1987:122). More importantly, Renfrew proposed three models for language replacement, but acknowledged that the archaeological testing of these models might prove challenging. His models include a demography/subsistence version, which ties movement to a search for subsistence (Renfrew 1987:124-125). His second model is one of “elite dominance”, wherein a small group of highly organized people dominates an existing population, usually militarily. He proposes that a ranked society will develop and that the social organization will be visible archaeologically in architecture (Renfrew 1987:131-133.) This elite dominance model has also been proposed to explain changes in the English archaeological record in the 5th through 7th centuries, when traces of the British-Romano population gave way to evidence of Anglo-Saxon occupation (Burmeister 2000:548, citing Arnold 1984 and Hodges 1989.) The third model that Renfrew presents is one of “system collapse”, visible archaeologically as the local movement of groups from the periphery to the center of a polity after the central authority has become top-heavy and lost control (Renfrew 1987:133-137). His first two models explicitly address change in terms of a resident and intruding population. In all three models there is movement of a population, or migration. For the first time, migration is addressed in terms of a process or activity.

Migration as a Process

David W. Anthony (1990) takes a different approach to migration in archaeology, suggesting that by focusing on the process of migration archaeologists can recognize prehistoric migrations by the specific patterns they produce (Anthony 1990:908). He draws from cultural

anthropology and demographics to describe processes of migration. Migration is likely to occur when there are “push-pull” factors present: negative (push) factors in the home territory; positive (pull) attractions in the destination; and, acceptable transportation costs (Anthony 1990:899). Often these push-pull factors are economic, but other causes may also come into play (such as the exploitation of one population by another, cultural factors, and belief systems).

Long distance migration is most often caused by economic factors (Anthony 1990:900). Studies of migration into a pre-populated area indicate that it generally occurs where the two groups involved have some prior interactions (Anthony 1990:901). Long distance migration would rely on the transmission of information pertaining to the destination and transportation routes. Anthony (1990:902) feels that these informational conduits may be traceable in the archaeological record in patterns of material culture.

Anthony provides three useful examples of a long distance migration pattern: leapfrogging, migration streams, and return migration; all three can have correlates in the archaeological record. To find leapfrogging, the archaeological record may include indications of early penetrations, followed by clusters of settlement separated by expanses of undesirable territory (Anthony 1990:902-903). In contrast, migration streams can be distinguished by artifact distributions from a particular point of origin, in a specific line of movement (Anthony 1990:903). Return migration might be discerned by archaeological examples that previously defined “long-term trade”. Exchange of goods could also be the result of a return migration stream. Places of origin, as well as destination, must be carefully examined to differentiate between return migration and long-distance trade (Anthony 1990:904). Unlike Rouse, Anthony acknowledges that migration is almost always a two-way movement; the initial migration will be

followed by a return migration to the place of origin (Anthony 1990:897-898). In this way, the information continues to be exchanged and subsequent migrations will occur.

Stefan Burmeister (2000) also grapples with the distinctions between migration, diffusion, and trade. While acknowledging that a theoretical framework is essential to discern migration, he admits that the proof of migration is to be found only in the material culture (Burmeister 2000:541). He shares Anthony's belief that information exchange is crucial to long distance migration and suggests that an initial penetration may be by traders, military personnel, or missionaries (Burmeister 2000:544). Burmeister also distinguishes between theories of mass migration and theories of smaller elite-dominated migrations (Burmeister 2000:549).

Michael Smith (2007) calls for systematic methods of documenting and analyzing possible incidences of migration, as well as the application of rigorous archaeological migration models (Smith 2007:593). One possible method, that he suggests, would be to start with a specific model of interaction or migration, then, evaluate the material record against that model (Smith 2007:595). The study of migration as it applies to prehistoric societies is very much a work in progress. Smith's idea of taking a specific model and testing the record against that model is a good way to approach the subject.

This analysis will start with Renfrew's elite-dominance language replacement model (1987:131-133), and apply it to migration. By examining the material record of a site, comparing it to another site or sites, and applying a model of migration, it should be possible to determine whether migration actually took place from one location to another one.

Elite Dominance Migration

To find elite dominance migration, there should be indications of at least an organized, ranked society. There does not necessarily have to be a major increase of population, but there should be evidence of the incursion of a population from outside the resident population in the material record. There should be an indication of an advance notice or information exchange – military, missionary, or commercial (Burmeister 2000:544). The first immigrants arriving at a center should represent either military, religious, or commercial interests. Subsequent arrivals would then join the earlier emissaries or settle in between them (Burmeister 2000:544). There should also be evidence of return migration, establishing the route and destination for subsequent arrivals. And, the migration may have taken place over time as a long-term process rather than an abrupt one-time movement (Burmeister 2000:540). Aspects of the process might include:

1. Advance contact, either military, missionary, or commercial;
2. Migration to a center with changes showing up at the center and a possible population increase;
3. Maintenance of connection to the sending population, through return migration and/or networks (social, kinship, military, trade, religious);
4. Spatial concentration of incoming population;
5. Migration of a selected population of elites;
6. Cause, such as military dominance, religion, trade (see Burmeister 2000); and
7. Changes in the material record as a result of the immigration.

An elite migration would produce discernible changes in the record – pottery, architecture, specific forms of artifacts, burials, site configuration (Cordell 1995:205), and caching practices. Migration should be identified only when there are “multiple indicators” to

show that a population movement occurred, according to Catherine Cameron's comment to Burmeister (Burmeister 2000:555). There should be a rough chronological correlation between the sending and receiving sites as to the specific traits that are being introduced (Cordell 1995:207). And, there should be a counterstream or return migration back to the place of origin (Anthony 1990:904.) This return migration, in turn, may transform the originating population as new ideas and materials are brought back with the returning emigrants (Burmeister 2000:549.) There might even be a reverse migration from the receiving population to the originating population, as more information is shared between the two locations.

As important as what an elite dominance migration looks like, is what it does not look like. An elite dominance migration is not a one-time occurrence, but an ongoing process (Anthony 1990:905.) It does not necessarily result in a population replacement, nor does it automatically imply control of an existing population.

The Maya site of Chichén Itzá, in Yucatán, Mexico, with more than 100 years of excavation, is a good elite dominance migration case study. Chichén Itzá is located in the state of Yucatán, in the Yucatán Peninsula of Mexico. It is in the northern part of the Maya "lowlands" that portion of Mesoamerica extending from northern Guatemala and Belize into and through the Yucatán Peninsula (Sharer and Traxler 2006:42.) Chichén Itzá lies north of the Puuc hills, and the large site of Uxmal (Figure 2.) It is approximately halfway across the peninsula.

The long history of excavation, the ethnohistory pertaining to the site, and its position as one of the dominant sites in the Northern Maya Lowlands (Sharer and Traxler 2006:44), makes Chichén Itzá a worthy test case for applying a model of elite dominance migration. There is an enormous corpus of literature devoted to Chichén Itzá, with extensive writings dealing with

supposed migrations or incursions into Chichén Itzá by Chontal or Putún Maya from the Gulf Coast and/or Toltecs. Much of this literature suggests contacts between Chichén Itzá and other Mesoamerican sites, particularly Tula, Hidalgo (approximately 1000 kilometers to the west of Chichén Itzá, see Figure 1), but migration has never received serious and thorough consideration as a process that might be responsible for changes in the material record. As recently as 2007, some scholars have dismissed migration models as insufficient to explain the interaction between Chichén Itzá and Tula (Gillespie 2007:102; see also Cobos 2006), relying on an outdated definition of migration that equates it with ethnic replacement (Lincoln 1986:188) or suggesting that migration is a static three part event consisting of “migration, invasion, and conquest” (Cobos 2006:180.) The model that I am proposing does not call for such a drastic outcome, nor does it suggest a sudden event. Rather, it first examines the published data for the site of Chichén Itzá (and Tula, the suggested sending population), to isolate those attributes of the material record that can be compared between the sites. Those components of the archaeological records will then be compared, to determine if some or all aspects of an elite dominance migration process are present. Before examining the archaeological record at Chichén Itzá and Tula, it will be useful to review some of the literature that pertains to these sites.

LITERATURE REVIEW

This summary will review some of the main sources pertaining to Chichén Itzá and Tula. The two earliest proponents of migration into Chichén Itzá were Alfred Tozzer and J. E. S. Thompson. Since much of their theory derives from ethnohistorical sources, I will begin there.

Ethnohistory

Prior to the Spanish Conquest, the Maya were considered to have the most developed writing system in the Americas. Their media included stone, stucco, ceramic, cloth, shell, and paper (de la Garza 2006:10). Unfortunately, the conquistadors and their missionaries systematically destroyed as many of the books or codices of the Maya as they could. Only three (or possibly four), pre-Conquest codices remain and these are dated to the Late Postclassic.

Post-contact Maya writings may be divided into two categories: legal documents and sacred, or community, texts (de la Garza 2006:10). Of the sacred texts, the best known include the Popul Vuh of the Quichés (Guatemala), the Memorial de Solalá or Anales de los Cakchiqueles, and multiple Books of Chilam Balam of the Yucatán (de la Garza 2006:11). These books, written in the 16th century by Maya educated by the Spanish friars, were written in the native Maya language using the Spanish alphabet. They preserve the religion and customs of the past, as well as capture the oral history and traditions that were in danger of being wiped out by the Europeans (de la Garza 2006:10).

Potentially relevant to Chichén Itzá, which may have had a Yucatec-speaking population (Wichman 2008:285), are the Books of Chilam Balam. “Chilam” in Yucateco means “that

which is the mouth” or “prophet”. “Balam” means “jaguar” and can also indicate a “witch”. The books of Chilam Balam were prophecies, written by priests who interpreted the ancient writings to explain the prophecies (de la Garza 2006:12). The religious and historical portions were copies of older texts; however they were clearly re-copied as the originals wore out and new text was sometimes added by the compilers. The version of the Chilam Balam of Chumayel (Roys 1933), for instance, relied on by Thompson (1970) and Tozzer (1957) references the date of January 20, 1782 in its body, even though the first European copy was made in 1868 (de la Garza 2006:14). Translation into European languages added more ambiguities, as the authors were writing in a European alphabet that did not contain the letters to express some of the sounds of their language (de la Garza 2006:16).

The other ethnohistoric document relied on in the first half of the 20th century was Diego de Landa’s *Relación de las Cosas de Yucatán* (Tozzer 1941), written in 1566. Landa wrote his book as an “apologia”, part of his rehabilitation for the part he played in the subjugation of the indigenous population (Gates 1978:xii-xiii). Also a second-hand account, Landa related history in his book as told to him by native informants (Roys 1972:58).

Starting in 1937, J.E.S. Thompson began publishing his ideas on the dating and the existence of possible foreign influences at Chichén Itzá. Relying on the Chilam Balam of Chumayel, as translated by Ralph Roys (Roys 1933), and on Landa’s *Relación* (Tozzer 1941), Thompson suggested two incursions into Chichén Itzá by foreigners (Thompson 1970:11). The first took place in A.D. 918, and was by a group that he called the Putún or Chontal Maya, who came from the Tabasco region (Thompson 1970:11). The second arrival was another Putún group, this time followers of Kukulcán, who arrived around A.D. 987 and brought with them the

Toltec or Tula influence (Thompson 1970:15-21). Joseph Ball (1974) also describes two incursions of foreigners into Chichén Itzá, but places the first incursion earlier than does Thompson, at A.D. 780 to 800 based on his interpretation of radio-carbon dates from nearby Balankanche (Ball 1974:91-92).

Thompson does admit that there are dating difficulties both within the Chilam Balam and at Chichén Itzá, where the majority of the inscriptions do not contain a full Long Count date, but use the shorter “katun ahau” date, that only supplies a katun ending and day (Thompson 1937:1-2). Another problem with dating is the disagreement as to which correlation should be used (Chase 1986:101-102).

Archaeological Investigations at Chichén Itzá

Formal investigations at Chichén Itzá were undertaken by the Carnegie Institution of Washington, D.C., beginning about 1925 (Ruppert 1952:1). Ruppert (1952) published on the architecture of Chichén Itzá and divided the buildings into two periods, the “Maya-Chichén” and the “Toltec-Chichén. Maya-Chichén is the earlier, with building taking place prior to A.D. 900; Toltec-Chichén follows, ending around A.D. 1200 (Ruppert 1952:1).

Other major publications from the Carnegie Institution investigations include write-ups on: the Temple of the Wall Panels (Str 3C16) (Ruppert 1931); the Caracol (Str 3C15) (Ruppert 1935); the Mercado (Str 3D11) with five additional gallery-patio structures (Ruppert 1943); the Casa Redonda (Pollock 1936); the Temple of the Warriors (Str 2D8) (Morris et al 1931); and Las Monjas (Str 4C1) (Bolles 1977).

The Peabody Museum also sponsored excavations at Chichén Itzá, publishing a number of works pertaining to the Great or Sacred Cenote, that included: studies on the copper, gold, and

other metals (Lothrop 1952); the jades (Proskouriakoff 1974); and, the remaining artifacts (Coggins, ed. 1992). The Great Cenote was originally dredged by Edward H. Thompson during his tenure as U.S. Consul at Yucatán (Willard 1926). The most significant publication from the Peabody Museum, however, was that of Alfred Tozzer (1957). Although titled *Chichén Itzá and its Cenote of Sacrifice: a Comparative Study of Contemporaneous Maya and Toltec*, the majority of the work deals not with the Cenote, but with the overall site itself - its architecture and history. Tozzer compares Chichén Itzá with other Mesoamerican sites, particularly with Tula (at almost every point of his presentation).

Tozzer describes the architecture of Chichén Itzá as beginning with a Puuc style (Ruppert's Maya-Chichén), which he labels "Chichén I". This architecture is dated to Late Classic times, and shows up in two types of buildings, temples and palaces (Tozzer 1957:13). According to Tozzer (1957:32), Chichén I ends in A.D. 948, and "Chichén IIA" begins at that time, lasting until A.D. 1145. He calls this the "Maya-Toltec" period. In addition to architectural evidence, he uses the fresco paintings and sculptures, historical sources, and dates taken from the site to reinforce his placement and ideas. Tozzer refers to a Toltec *entrada* and suggests that it was "a peaceful penetration by a foreign group" (Tozzer 1957:26). While admitting that scholars differ on where the Toltec actually originated, Tozzer suggests they originated at Tula, Hidalgo (Tozzer 1957:27).

Mexican excavations were conducted at Chichén Itzá after the conclusion of the Carnegie and Peabody investigations, under the direction of the *Instituto Nacional de Antropología e Historia* (INAH) from 1926 to 1980 (see Maldonado 1977 for a synopsis of these investigations.) Excavations were also undertaken under the direction of Charles Lincoln in the 1980's (Lincoln

1990). The most current excavations at Chichén Itzá are those of the Chichén Itzá Archaeological Project, running from 1993-present. This project is also under the auspices of the Mexican government and results have been published in numerous sources (Cobos 2004 and 2007; Schmidt 1994, 1998, 1999, 2003, and 2007).

Additional investigations in and near the settlement of Chichén Itzá have been undertaken by Susan Kepecs (2007, 2003, and 1998), and Anthony Andrews (1990; Andrews and Robles, 1985).

George Vaillant (1935) published the first ceramic sequence for Chichén Itzá in summary form in 1935 (Lincoln 1986:193). The first major ceramic study of Chichén Itzá was undertaken by George Brainerd (1958), who worked from previously-obtained ceramic samples. Many of the samples were in poor condition or badly labeled (Brainerd 1958:6). Brainerd labeled his sequences to correspond with the Tozzer classification of architecture. Robert Smith (1971) published a more complete (and relevant) ceramic sequence for Mayapán; his work also included ceramics from other Yucatán sites. Smith's sequence has been updated and refined by a number of scholars - and their work will be treated in the next section of this paper.

Iconography, Art, and Hieroglyphic Inscriptions at Chichén Itzá

Volumes have been written about the iconography and art of Chichén Itzá. Among the earliest writings are those contained in the Morris, Charlot, and Morris publication (1931), which describes the murals, sculpture, and other artwork in the Temple of the Warriors complex. Arthur Miller (1978) published a study of the murals on the walls of the Upper Temple of the Jaguars (Str 2D1), analyzing battle scenes between "Putún invaders" and the resident population. He also outlined evidence for contact between Chichén Itzá and southern Oaxaca in this same

article (A. Miller 1978:213-214). Mary Ellen Miller analyzed the *chacmools* at Chichén Itzá and Tula (M.E. Miller 1985). Numerous other studies were published by art historians and archaeologists, including Schele and Mathews (1998) and Cohadas (1978) on the Great Ball Court (Str 2D1); Kurjack and Robertson (1981); Ringle (2004); and, Ringle, Negron, and Bey (1998); referencing the influence of Tula and the Toltecs on Chichén Itzá, and discussing the military nature of the art at Chichén Itzá.

Other discussions of the similarities between the artwork at Chichén Itzá and Tula, Hidalgo suggested that the influence flowed in the other direction, from Chichén Itzá to Tula (Davies 1990; Kubler 1986; McVicker 1985). A good analysis of the iconography at Chichén Itzá has been provided by Karl Taube (1994). He points out the Toltec and Maya aspects of the iconography, but follows McVicker in finding it much more complex than a mere “direct influence”.

There is also substantial literature dealing with the hieroglyphic inscriptions at Chichén Itzá, beginning with Herman Beyer’s (1937) study, and continuing with the works of David Kelley (1968; 1976). Other discussions of Chichén Itzá’s hieroglyphic inscriptions are contained in Grube (1994); Kowalski (2007); Wren, Schmidt, and Krochock (1989); Ringle (1990); and Lopez de la Rosa (2006).

Investigations at Tula, Hidalgo

Because the main focus of this paper is the relationship between Chichén Itzá and the Toltecs, a brief mention of the literature pertaining to Tula, Hidalgo is in order. The first systematic investigations at Tula were undertaken by Jorge Acosta (1942-1944, 1945, 1954, 1957, 1960, 1961, 1964, 1974) for INAH beginning in 1940. The majority of his investigations

took place in the center of this archaeologically important site, specifically in the *Cerro del Tesoro* or *Tula Grande*. In thirteen field seasons, spanning twenty years, Acosta and his team excavated the principle structures in the Tula epicenter: Ball Court 1; *Edificio B*; *Coatepantli* (Serpent Wall); *Edificio 1 (Palacio de Quetzalcoatl)*; *Edificios 4* and “4”; *Edificio 3*; *Sala 1*; *Sala 2*; *Sala 3*; *Cuartos 1 –6*; *Vestibulos 2, Norte* and *Oeste*; *Edificio C*; *Adoratorio*; Mound A; *Edificio D*; and *Edificio 2*. His other excavations found burials at *El Salitre*, *Cerro El Cielito*, and a pyramid at *El Corral*. His ceramic studies were written up by two former students, Federica Sodi Miranda and Felipe R. Solis Olguin (1987:19-34).

The second large INAH project, *Proyecto Tula*, was begun in 1968 (Matos Moctezuma 1974, 1976). This project primarily undertook survey work, but also restored Ballcourt 2 in the urban center.

Additional investigations were undertaken at Tula by the University of Missouri Tula Project (Healan 1989). This project extended the investigations beyond Tula Grande, the ceremonial center, to include residential excavations. The project also conducted some survey work, adding to that done by the previous INAH project. Robert Cobean, a member of the Missouri project, also conducted additional research to refine the ceramic sequence (Cobean 1990). The most current chronology for Tula may be found in Mastiche, Cobean, and Healan’s 2002 volume, *Ancient Tollan: Tula and the Toltec Heartland*.

Other Current Theories

Modern theories that deal with Chichén Itzá and influence from Central Mexico look at Chichén Itzá not as an isolated site, but rather in context with other surrounding parts of Mesoamerica. World systems theory attempts to place Chichén Itzá in a larger geographic

framework (Kepecs 2005 and 2007; Kepecs, Feinman, and Boucher 1994; Kepecs and Kohl 2003; Smith and Berdan 2003). Other scholars look at trade during the Terminal Classic period, and address Chichén Itzá's role in the trade of salt (Kepecs 2005) and obsidian (Andrews et al 1989; Braswell 2003). The prevalence of what are interpreted to be Toltec elements at Chichén Itzá has also been explained in terms of an international religious horizon that spread the cult of Quetzalcoatl (Diaz Bolio 1952) and may have infused leadership institutions as well (Ringle 2004; Bey and Ringle 2007; Ringle, Gallareta, and Bey 1998).

DATA AND DISCUSSION

Using the elite dominance model (Renfrew 1989:131-133) for a theoretical framework, the material record at Chichén Itzá will be examined for evidence that migration once took place. The more aspects of migration that are found, the more plausible the hypothesis becomes that migration occurred. Examining individual factors in the migration process will ultimately allow for a decision for or against the migration hypothesis (Burmeister 2000:553) and also enable closer analysis to differentiate other types of contact (trade, warfare, diffusion). Historical sources will not be considered, as the focus is on the archaeological record. The kinds of information that are relevant to this discussion include: pottery/ceramic types and styles; architectural styles; and other artifacts, such as censers; site layout; burials; and caches (Cordell 1995:203). The rich iconography and artwork at Chichén Itzá have been exhaustively described and interpreted; and have been used to reinforce theories from the “Toltec invasion” (Tozzer 1957) to the spread of the international cult of Quetzalcoatl (Ringle et al 1998.) Because there has been so much published on the art of Chichén Itzá and its interpretation as “proof” of military conquest (among other theories), the art will not be treated in this analysis.

Architecture

Chichén Itzá - Overview

For architectural purposes, the buildings in the urban core of Chichén Itzá (Figure. 3) have been divided into two styles based on stylistic grounds and dates on lintels, what Ruppert (1952) calls Maya-Chichén and Toltec-Chichén, the latter being edifices of a “Mexican” style. Ruppert designates the Maya-Chichén buildings as being from the earlier period, with construction occurring prior to A.D. 900 and he relied (incorrectly) on Thompson (1970:iv) for

the dates (Ruppert 1952:1-2). The earlier “Maya” style has also been referred to as “Puuc” or “Florescent”; the subsequent “Mexican” or “Toltec” style has been termed “Modified Florescent”. This terminology emphasizes the architectural traits that Chichén Itzá shares with other Puuc sites in Northern Yucatán, as well as the architectural features that the two styles have in common (Andrews V and Sabloff 1986:436; Lincoln 1986:145; Wren and Schmidt 1991:202-203).

Salient features of the earlier Maya style include buildings that rise from steep platforms or low basal substructures or podiums. Temples consist of a single range of two or more longitudinal rooms; this includes two parallel ranges of rooms, with an outer chamber opening into the inner rooms, or parallel longitudinal rooms, with transverse chambers flanking either end. Palace or range structures are found only in the Maya-Chichén period. Supporting platforms have nearly vertical, unbroken faces. Lower zones of buildings are generally undecorated. There may or may not be a podium (platform), but there is always a plinth (base.) Floors of inner rooms are higher than the outer. Buildings have stone lintels, which may contain hieroglyphic inscriptions. When the upper zone is decorated, the decoration is all over and consists of geometric designs and masks (Ruppert 1952:2). Buildings assigned to this period include: the Monjas (Str 4C1); Akabdzib (Str 4D2) Casa Colorada (Red House) (Str 3C9); Casa del Venado (Deer House) (Str 3C7); Temple of the Three Lintels (Str 7B3); and, Temple of the Four Lintels (Str 7B4) (Ruppert 1952:1). Tozzer also assigns the Caracol (Str 3C15) and House of the Phalli (Str 5C14) to the first period (his Chichén I phase) (Tozzer 1957:24).

Toltec structures are defined as including: temples on terraced pyramids; temples on pyramids with colonnades at the base forming a complex; simple one- or two-chambered

structures on low platforms; gallery-type structures (and the great colonnade); gallery-patio buildings; sweat houses; dance platforms; *Tzompantlis*; and the ball courts. Many of the buildings have a basal batter on the exterior; lintels are generally wooden (the occasional stone lintel may be sculptured but is not inscribed); floors are on the same level (not the case with gallery-patio structures); and there are no podiums or plinths. Architectural elements include: serpent columns; feathered-serpent balustrades; columns (square or rounded); colonnades; *chacmool* Yucateco Maya for jaguar or tiger) figures; standard bearers; jaguar stone seats; sacrificial stones; stone *incensarios*; roof elements; and, sculpture on panels. Decorations include: masks; lines of warriors; jaguars; and, eagles. Altars may be solid or supported by Atlantean (warrior) figures (Ruppert 1952:2). Structures assigned to this group include: the Great Ball Court (Str 2D1); Upper and Lower Temples of the Jaguars (Str 2D1); Castillo (Str 2D5); and the Temple of the Warriors Complex (Str 2D8) (Ruppert 1952:1). Tozzer contends that the Temple of the Initial Series (5C4) is also a Toltec period building, with the dated foundation stone representing a re-use of a Maya element (Tozzer 1957:24).

While early scholars contended that the Modified Florescent (Mexican) succeeded the Florescent (Maya) building style (Tozzer 1957), more recent scholarship finds a temporal and stylistic overlap in the two building styles, with central Mexican elements added into the original Puuc style (Andrews V and Sabloff 1986:436-437). Some researchers even go so far as to maintain that the two styles are contemporaneous (Lincoln 1986:184).

Tula - Overview

The monumental center of Tula is an area known as Tula Grande (Figure 4). This area contains the architecture and features most often mentioned in connection with Chichén Itzá.

While stratigraphy indicates that Tula Grande was occupied for approximately 1000 years (Mastache et al 2002:2), the apogee of its occupation was a 250 years period that corresponds to the Tollan Phase, which lasted from A.D. 900 to A.D. 1150 (Mastache, et al 2002:41). It appears that the architecture and iconography was of only one style (Bey and Ringle 2007:414).

Although Acosta and subsequent projects excavated a number of buildings in the monumental center of Tula, including two ball courts, the most important structures discovered were a group consisting of Edificio B (or Pyramid B) and its' surrounding structures (Figure 4). Edificio B is a square five-tiered platform atop a long terrace that also supports Edificios 1 and 3. It is presumed that a temple was on top of Edificio B, as there are columns there, consisting of Atlanteans, warrior columns, and serpent columns (Acosta 1942:128-130). Acosta (1942-1944:139-145, 155-156; 1945:30-31, 58) identified three construction stages, of which the second is the best preserved. Decorations on this second stage included carved tablets of jaguars, coyotes, eagles, buzzards, and a composite creature (bird-serpent-jaguar-human) that might have represented Quetzalcoatl (Diehl 1989:17).

To the east of Pyramid B lies Edificio 1, or the *Palacio de Quetzalcoatl*. This building, which contained seven construction phases, was also located on a large platform, but it contained a series of sunken rooms (Acosta 1942-1944:138-139; 1945:32-33, 58-59; 1954:56-60; 1964:58-61). The roof was supported by columns (Diehl 1989:20-21).

To the west of Pyramid B, Acosta's Edificio 3, is a large platform with three large rooms (*salas*) on top (Figure 5). Each room is flanked by smaller rooms to the north, and each consists of a sunken central patio with columns. To the north, south, and west are *vestibulos*, also with columns. *Vestibulo 2* and *Sala 2* contained square columns; the columns in the other *salas* and

vestibules were round (Diehl 1989:23). Salas 1 and 2 contained benches, altars, offerings, and *chacmool* figures. Sala 2 is known as the *Palacio Quemado*, or “Burnt Palace”, because of the intentional destruction found there (Acosta 1945:34-37, 59-60; 1954:43-44, 67-74, 89, 91, 95-106, 112-113; 1957: 120-134, 144, 146-169; 1960:39-48, 68; 1961:32-54, 56-58; 1964:48-58, 72-76). Sala 3 contained an altar (Diehl 1989:24-25).

The *Coatepantli* (Serpent Wall) is a freestanding wall to the north of Pyramid B, and contemporaneous with it (Acosta 1942-1944:139-145, 155-156; 1945:30-31, 58; Diehl 1989:17, 19).

Discussion

The Pyramid B complex at Tula Grande bears a striking resemblance to the Temple of the Warriors complex at Chichén Itzá (Figure 6) – in architecture, decoration, and interior contents. The Temple of the Warriors itself is set on a truncated pyramid (Morris et al 1931:13), as is the temple on top of Pyramid B. Both buildings contained Atlantean figures, warrior columns, and serpent columns (Diehl 1989:17; Morris et al 1931:14, 19-20, 24). Both the Temple of the Warriors (Morris et al 1931:22) and Salas 1 and 2 in Tula (Diehl 1989:24-25) contained *chacmool* figures. The Temple of the Warriors had roof decorations in the form of a “G” fret (Morris et al 1931:33); a similar design topped the *Coatepantli* (Diehl 1989:17).

At Chichén Itzá, overlapping with the west face of the Temple of the Warriors pyramid (Str 2D8) is the Northwest Colonnade (Str 2D8), which consists of 4 rows of columns running north-south (Morris et al 1931:52, 54). At the south end of the back wall of the Northwest Colonnade is access to the North Colonnade or Group of 1000 Columns (Str 2D10). The

Northwest Colonnade also connects to the West Colonnade (3D1) (Morris et al 1931:64).

(Figure 6)

Within the Temple of the Warriors pyramid is the Temple of the Chacmool (Str 2D8), which was partially demolished to construct the Temple of the Warriors (Morris et al 1931:70). Like the Temple of the Warriors, the Temple of the Chacmool was a column-supported building; a *chacmool* was found within it (Morris et al 1931:71, 78). A demolished colonnade flanked the west side of the temple, more recent than the West Colonnade but older than the Northwest Colonnade. This colonnade was demolished to allow for construction of the Northwest Colonnade (Morris et al 1931:86). Like Pyramid B and Vestibulo 1 at Tula, the Temple of the Warriors and Northwest Colonnade and the Temple of the Chac Mool and the Demolished Colonnade present the format of a columned-hall on a low platform flanking the principle side of an elevated substructure with a temple on the top (Morris et al 1931:88). An additional similarity between the Temple of the Warriors and the Temple of the Chacmool and Tula Grande is the banded polychrome wall painting found in the passageway between the Palacio Quemado and Pyramid B, which is similar to paintings found in the Chichén Itzá temples (Acosta 1954:44).

It should be noted that Acosta excavated and reconstructed the Pyramid B complex in the 1940's, some twenty years after the Carnegie reconstruction of the Temple of the Warriors complex. Acosta was familiar with the Temple of the Warriors as restored, and it has been suggested that his reconstruction of the Pyramid B structures was influenced by the Temple of the Warriors (Molina 1982:130-132). While Acosta may have based some of his restoration on

that of the Temple of the Warriors, he also had to work with the elements already in existence – remains of a pyramid and a vestibule with indications of columns.

The architectural dating of these two building complexes is a bit murky. While stratigraphic sequences exist for both Tula and Chichén, there are no ceramic ties to the specific structures. Bey and Ringle maintain that the “Toltec” iconography, sculpture, and probably even the major architecture occurred during the Late Tollan phase at Tula, after A.D. 950 (Bey and Ringle 2007:415). This is more or less consistent with Mastache, Cobean, and Healan, who move the Tollan phase start to A.D. 900 and place the abandonment of Tula Chico and the beginning of construction at Tula Grande (Toltec “A”) in the Early Tollan (A.D. 900 – 950). A re-orientation of the urban center takes place at Tula during the Late Tollan phase, beginning A.D. 950, which is considered the apogee of Tula. (Mastache et al 2002:41, 82). Bey and Ringle interpret the construction sequence proposed by Morris (1931:172-177) for the Temple of the Warriors complex to suggest that the Temple of the Chacmool and the Temple of the Warriors were constructed after the Castillo at Chichén Itzá (Bey and Ringle 2007:411), and they suggest that they date to the early or middle 10th century, based on a radiocarbon date from the Castillo (A.D. 891 +/- 100) (Ringle et al 1998:Table 1) and epigraphic dates (Bey and Ringle 2007:416). Cobos places the architecture of the Great Terrace (in which the Castillo and Temple of the Warriors complex are located) as 10th century, including the Castillo (Cobos 2007:324). Finally, the Morris construction sequence for the Temple of the Warriors complex (Morris 1931:172-177) places the Castillo in the third construction interval, the Temple of the Chacmool in the 5th, and, the Temple of the Warriors in the seventh, final stage. That would argue for a later date for

the Temple of the Chacmool and the Temple of the Warriors, closer to the middle of the 10th century. Architecturally, then, there is a potential window of overlap between the two sites.

There is also a resemblance between the Edificio 3 – Salas 1, 2, and 3 – at Tula (Figure 5) and the Mercado of Chichén Itzá (Cobos 2007:335) (Figure 7), in that both are of the gallery-patio type. The Mercado consists of a sunken patio surrounded on four sides by a gallery of columns. The columns alternate between round and square (Ruppert 1943:229). These gallery-patio or patio buildings are extremely rare in the Maya world. Outside of Chichén Itzá the only known Maya example is at Nohmul, Belize (Chase and Chase 1982:597-598). One has also been reported by David Freidel from Cozumel (Arlen F. Chase, personal communication 2008). The Mercado is placed in the Mexican or Toltec phase of construction (Ruppert 1943:231; Tozzer 1957:42). The same gallery-patio structure is seen in Edificio 1 at Tula as well (Tozzer 1957:79-80).

The Palacio Quemado is thought to have had a public function; the Mercado at Chichén Itzá, with its more restricted access and associated domestic artifacts (spindle whorls, metates, utilitarian pottery fragments), probably had a residential function (Cobos 2007:335). Similar domestic/residential archaeological material has been found in free-standing gallery-patio structures at Chichén Itzá (Str 2A17), Tula (Houses VI and X), and Nohmul Str 20 (Cobos 2007:335; see also Chase and Chase 1982).

The similarities in decoration, iconography, sculpture, and painting at the two sites are numerous. Among the most important are: serpent columns; Atlantean figures; low-relief carvings on columns and daises; and, images of skeletal figures, jaguars, and eagles. One of the most striking features that both sites have in common is the sculpture known as *chacmool*.

Fourteen have been found so far at Chichén Itzá and twelve at Tula (M. E. Miller 1985:7). Tozzer (1957:69-84) provides an exhaustive list of comparative architectural and decorative features at the two sites.

Architecturally, it appears that there are several structures with striking similarities at Chichén Itzá and Tula. The first set of buildings is the Temple of the Warriors (Chichén Itzá) and Pyramid B (Tula). While the dating of these two edifices is not secure, the Temple of the Warriors and the engulfed earlier Temple of the Chacmool probably date to the middle of the 10th century, that is, around A.D. 950 or possibly later. Pyramid B, in its final form, dates to the Tollan phase, which commenced in A.D. 900 – 950, although some scholars put the beginnings of the iconography and sculpture associated with this building in the Late Tollan (A.D. 950), while others do not make that distinction. There appears to be temporal overlap in the construction of these two buildings.

Additionally, the Palacio Quemado, which may be considered to be part of the Pyramid B Complex at Tula, and the Mercado and other gallery-patio structures at Chichén Itzá have many similarities. The Mercado has also been dated to the later architecture at Chichén Itzá, so there is overlap there as well. The gallery-patio style of these two buildings is also relatively rare in other parts of the Maya world, so these two sites may be said to share a fairly unique architectural trait.

Ceramics

Chichén Itzá

“In spite of the years of extensive archaeological investigations at Chichén Itzá, no ceramic chronology has been defined from firm stratigraphic contexts” (Anderson 1998:157).

Robert Smith's (1971) ceramic sequence was the result of excavations he undertook at Chichén Itzá as well as other sites in 1954. He published his ceramic sequence for Chichén along with those of Mayapán, Uxmal, and Kabah in 1971, correlating the Yucatán phases to Brainerd's 1958 stages, as well as the Central and Southern Maya areas (Smith 1971:173, see Table 1). Smith made 19 "cuts" at Chichén Itzá, but reported only the contents of five deep Sotuta phase refuse deposits (Smith 1971:170). Out of a total of 19,217 sherds, he found the following quantities for the periods of heaviest occupation at Chichén Itzá (Table 1):

Table 1: Sherd Distribution by Date (after Smith 1951:122, 173)

Dates	Smith Phases	Brainerd Phases	Number
A.D. 600 - 800	Tzakol (Motul)	Late Regional	3
A.D. 800 - 1000	Cehpech	Florescent	404
A.D. 1000 - 1200	Sotuta	Early Mexican	18,768
A.D. 1200 - 1300	Hocaba	Middle Mexican	21

Four sherds were assigned to the Tases phase, A.D. 1300 – 1450 (Brainerd's Late Mexican), 12 to the Cochuah phase, A.D. 300 – 600 (Brainerd's Middle Regional), and the remaining five to the Thihosuco phase 800 B.C. to A.D. 300, (Brainerd's Late Formative) (Smith 1971:122, 173). It is important to note that the majority of sherds fall into the Sotuta phase, followed quantitatively by the Cehpech phase.

Smith described the Tzakol or Motul phase as taking place between A.D. 600 and 800. The Tzakol phase (also known as Hoxchunchan) is considered to be a late Early Classic phase

that was over by A.D. 550 in the Southern lowlands (A. Chase 1190:161); which suggests a dating error on Smith's part.

Smith separates the Sotuta fragments into three main wares: Chichén Unslipped, Chichén Slate, and Chichén Red. For all three domestic wares, the stylistic diagnostic is form (Smith 1971:173, 177, 181). He also notes the two trade complexes associated with the Sotuta fragments: Silho Fine Orange and Tohil Plumbate (Smith 1971:171).

Chichén Unslipped contains: jars with medium-high outcurving shoulders to a vertical neck; hourglass censers that differ in detail of form and body thickness from those in the previous Cehpech Complex; ladle censers; and, tripod censers peculiar to the Sotuta complex. Decorative elements such as spikes, buttons, fillets, and flanges differ from those found in other complexes (Smith 1971:173).

Chichén Slate Ware generally consists of dishes that are wide and shallow without support or that are rounded to a convex base with the hollow bulbous feet typical of the Sotuta complex (and also linked with Silho pyriform vessels). Also distinctive to this complex are restricted-orifice bowls. Grater bowls (Figure 8) appear for the first time in the Sotuta phase. Jars differ from earlier forms with high, outcurving necks and somewhat everted rims. A small percentage of the jars are tripods that resemble a shape found in the Silho Fine Orange group (Smith 1971:177).

Chichén Red contains: medium-high to high neck jars; dishes with rounded sides; restricted-orifice bowls; graters; and, tripod dishes that are similar to those in the Chichén Slate Ware. Additionally, there are dishes with flaring sides and pyriform vessels. Smith also notes that both Chichén Slate and Chichén Red Wares have a waxy feel and are smooth. He points out

that many of the designs used in Chichén Red are typical of the designs associated with Silho Fine Orange (Smith 1971:181). Brainerd also indicates a belief that this ware shows Central Mexican influence in both form and decoration and refers to it as Mexican Medium Redware. Brainerd suggests that these vessels were only used by elites. He further posits that the strong influence of “Mexican” forms and designs on these vessels is an indication of the cultural orientation of the elites to the Mexican mainland (Brainerd 1958:181).

The Silho Fine Orange Group is associated with the Sotuta Complex as an import (Smith 1971:184). Forms include jars (with and without bulbous feet), hemispherical bowls, tripod dishes, pyriform vessels, and restricted bowls (Smith 1971:182). The other tradeware is Tohil Plumbate, with jars and restricted bowls represented (Smith 1971:185).

One weakness in Smith’s analysis is his attribution of the sherds that he found in the five analyzed cuts as Sotuta based on their association with Sotuta phase architecture (Smith 1971:171). He expected to find Sotuta ceramics because he was looking at Sotuta architecture. The three main wares that Smith catalogues - Chichén Slate, Chichén Red, and Chichén Unslipped - have variants in Puuc cities as well; these variants are classed in the Cehpech Phase (A.D. 800-1000) in the other cities, prior to the Sotuta Phase (A.D. 1000-1200) (Smith 1971:27-29). Both Smith and Brainerd agreed that the Puuc and Chichén variants of the red and unslipped wares are very similar (Smith 1971:27-28; Brainerd 1958:52-56). The same may be said of the Chichén and Puuc slate wares, and the regional variants are distinguished by form only (Brainerd 1958:55; Smith 1971:178; see also Lincoln 1986:175-183).

Current scholarship now holds that there was at least a partial overlap between the Cehpech and Sotuta ceramic phases at Chichén Itzá, if not a total overlap. The partial overlap

theory holds that sites with a Cehpech component co-existed with the Sotuta Phase Chichén Itzá for a short period in the Late Classic. The second model contends that the two ceramic phases were completely contemporaneous at the end of the Classic period. In some parts of the Yucatán the overlap was partial; in others it was total (Andrews and Sabloff 1986:447; Cobos 2004:518). Peter Schmidt (2007) goes so far as to say that Sotuta is the predominant complex starting around A.D. 850, with very little Cehpech representation (Schmidt 2007:157). Cehpech, which account for only 3% of all excavated ceramics at Chichén Itzá (Rafael Cobos, personal communication 2008), probably overlaps Sotuta almost completely at Chichén Itzá. This categorization moves the date of the Sotuta ceramic complex up 150 years to A.D. 850, which corrects the dating discrepancy with other Puuc sites. Schmidt also believes, based on his excavations, that Chichén Itzá was sparsely occupied prior to the early 9th century (A.D. 800 – 850) (Schmidt 2007:194).

Cobos reads the ceramic evidence from excavations as supporting an early and a late phase of the Sotuta complex at Chichén Itzá. The early phase is distinguished by Chichén Slate Ware, Chichén Unslipped Ware (without hourglass censers), Thin Slate, Chichén Red Ware, and Fine Orange (Silho Fine Orange). The late phase is defined by Chichén Slate Ware, Chichén Red Ware, Chichén Unslipped Ware (including hourglass censers), Silho Fine Orange, Fine Buff Orange, and Tohil Plumbate (Cobos 2007:325). The early phase of Sotuta ceramics is associated with a site centered at the Monjas Complex, while the late phase corresponds to a shifted site center at the Great Terrace (Cobos 2007:326). A revised ceramic chronology for the Late Classic to Early Postclassic at Chichén Itzá, assuming a partial overlap of Cehpech with Sotuta

ceramics and setting aside the question of the extent of that overlap (which is unanswerable at this time), would look something like the following (Table 2):

Table 2: Revised Ceramic Chronology, Chichen Itza (after Smith 1971:173; Schmidt 2007: 182; Cobos 2007:325-326)

Dates	Ceramic Phase
A.D. 600-800	Motul or Proto-Pizarro
A.D. 800-900?	Cehpech
A.D. 850-900	Early Sotuta
A.D. 900-1150	Late Sotuta
A.D. 1150-1300	Hocabá

Tula

The first ceramic sequence for Tula was proposed by Jorge Acosta in the mid-20th century and was published posthumously (Sodi Miranda and Solis Olguín 1987). In 1990 Robert Cobean revised Acosta's chronology by dividing the Corral Complex (A.D. 800 – 950) into Corral (A.D. 800 – 900) and Terminal Corral (A.D. 900 – 950) (Cobean 1990:45-46). Cobean describes Terminal Corral as a transitional phase to the subsequent Tollan Phase (A.D. 950 to 1150/1200), with primary diagnostics of Joroba Orange on Cream and Mazapa Red on Brown (Cobean 1990:46-48). As did Acosta, Cobean believes that the major construction at Tula Grande corresponds to the Tollan Phase, and he also agrees that Tula Chico was the prototype for Tula Grande (Cobean 1990:46, 48).

Mastache, Cobean, and Healan (1990:49) modified this chronology by refining the dating to start the chronology fifty years earlier than the 1990 Cobean/Acosta version, thereby dating the first five phases fifty years earlier than the prior chronology. Their second modification was to subdivide the Tollan Phase into an early and late sub-phase (Mastache et al 2002:43). The modified chronology is shown in Table 3.

Table 3: Tula Ceramic Chronology (after Mastache, Cobean, and Healan 1990:43, 49)

Dates	Phase
A.D. 650-750	Prado
A.D. 750-850	Corral
A.D. 850-900	Terminal Corral
A.D. 900-950	Early Tollan
A.D. 950-1150	Late Tollan
A.D. 1150-1350	Fuego
A.D. 1350-1520	Palacio
A.D. 1520-1650	Tesoro

The major diagnostic of the entire Tollan Phase ceramic complex is Jará Polished Orange (Mastache et al 2002:49). Jará Polished Orange is found in dishes, bowls, (Mastache et al 2002:218) and tripod dishes (Sodi Miranda and Solis Olguín 1987:90) (Figure 9). These forms are also found in the Sotuta phase Chichén Red Ware type Dzibiac Red (Smith 1971:178).

Mastache, Cobean, and Healan (2002:82) suggest that Tula Grande underwent two urban transformations, corresponding to the Early and Late Tollan sub-phases: the first upon the

abandonment of Tula Chico and the second with the apogee of Tula that was accompanied by changes in ceramics and a re-orientation of the urban center (from 17 degrees east of north to 15 degrees west of north).

The Tollan Phase ceramic complex includes approximately twenty-five types, among which are: the Jará Polished Orange bowls and dishes; Soltura Smoothed Red *ollas*; Macana Red on Brown grater bowls; Rebato Polished Red dishes; large Toza Smoothed Brown bowls; Bordo Red on Brown *ollas*; Acta Polished Red vessels (bowls and *tecomates*); Sillón Incised bowls; Abra Coarse Brown *braseros*; Blanco Levantado *ollas*; Alicia Openworked censers; possibly Manuelito Plain Brown bowls; Tarea Polished Red jars; and, Tohil Plumbate vessels (Mastache et al 2002:48). The diagnostic types for the Early Tollan sub-complex are Mazapa Red on Brown, Joroba Orange on Cream, and Manuelito Plain Brown. The first two are also associated with the Terminal Corral Phase at Tula and the Coyotlatelco Sphere in Central Mexico, but were also found in a small percentage in the Early Tollan Phase (Mastache et al 2002:218). Mazapa Red on Brown is not considered a good diagnostic, however, due to its scarcity at Tula and its probable origination in Central Mexico (Mastache et al 2002:49). For the apogee of Tula (Late Tollan Phase), the best marker is Jará Polished Orange along with Tohil Plumbate (the most important tradeware) (Mastache et al 2002:218, 229). In addition to Tohil Plumbate, other imports include Silho Fine Orange and a “Nicoya” polychrome, identified as a grouping of Central American (Honduras and El Salvador) types (Bey and Ringle 2007:392). A few sherds designated as “Nicoya” have been recovered from the Sacred Cenote and in a few other isolated excavations at Chichén Itzá (Bey and Ringle 2007:392.)

Discussion

At the outset, two caveats need to be kept in mind when comparing the ceramic sequences at Tula and Chichén Itzá. First, it is suggested that both Tula and Chichén Itzá have short (fifty year), transitional sub-phases – Early Tollan and Early Sotuta. And, the ceramic chronologies at both sites have been re-aligned, with the dominant complex during the site apogee starting earlier than previously thought. In the case of Chichén Itzá, the Early Sotuta complex is thought to begin in A.D. 850, 150 years earlier than the Smith (1971) chronology. At Tula the revised chronology has the Early Tollan phase beginning fifty years earlier than the previously-accepted dating, in A.D. 900. This is significant insofar as even a fifty-year re-alignment can dramatically shift the demographics at a site (A. Chase 1990:151).

Significantly, important diagnostics of the late Sotuta phase at Chichén Itzá, such as the hourglass censer form and Tohil Plumbate ware (Cobos 2007:325), are also part of the Tollan phase ceramics at Tula and even part of the defining assemblage for the Tollan Sphere that occurs at contemporaneous sites in Central Mexico (Mastache et al 2002:48-49; see also Diehl 1993). Silho Fine Orange, the predominant fine orange ware found at Chichén Itzá and previously thought to be lacking at Tula, has been recovered at Tula from an obsidian workshop (Bey and Ringle 2007:391).

Bey and Ringle (2007), in their comparative analysis of Tollan Phase ceramics at Tula and Sotuta Phase ceramics at Chichén Itzá, conclude that at both sites there were changes in the basic or common serving and preparation vessels. Tula's Jará Polished Orange resembles Chichén's Dzitaz Slate in both forms and color (Bey and Ringle 2007:390), and shares the tripod dish form with the Chichén Red type Dzibiac Red (Smith 1971:181; Sodi Miranda and Solis

Olguín 1987:90). The Dzibiac Red found at Chichén Itzá is similar to Tula's Rebato Polished Red (Bey and Ringle 2007:390). Both sites contain imitations of Fine Orange (probably Silho Fine Orange) - Dzibiac Red at Chichén Itzá and Sillón Incised from Tula - and both have grater bowls. Grater bowls, one of the characteristics of Tollan Phase ceramic complexes, are almost never found in Cehpech ceramic complexes. Another unusual form, not found outside of Chichén Itzá in the Maya area during the Late/Terminal Classic period, is the comal. Comales are found at Tula, where they are associated with the Tollan Phase (Bey and Ringle 2007:390). The presence of comales and grater bowls at Chichén Itzá argue that domestic ceramic influence flowed from Tula to Chichén Itzá. Brainerd's observations (Brainerd 1958:181) on the Central Mexican influence in form and decoration on Chichén Red supports this directionality.

A pipe, a form rarely found in Mesoamerica, has been reported at Chichén Itzá (Morris 1931:177-179). Similar pipes have been reported by Acosta at Tula (Sodi Miranda and Solis Olguin 1987:39). Finally, the Sotuta Phase at Chichén Itzá contains a ceremonial sub-complex of braziers, frying pan censers, and open-work censers. All three of these forms have very similar counterparts in the Tollan Phase ceramic complexes of Tula (Bey and Ringle 2007:390-391). However, the ceremonial sub-complex is much rarer at Chichén Itzá than at Tula (Bey and Ringle 2007:396), which again suggests it first appeared at Tula.

It is important to note that current scholarship indicates that at both Chichén Itzá and Tula there was a dominant ceramic complex during the respective site apogee, which lasted at least 250 years. Both complexes have been divided into early and late phases - and each phase has distinctive markers. At Tula, the Tollan ceramic complex (A.D. 900 – 1150) is associated with the apogee of Tula's development and the monumental architecture of Tula Grande (which so

resembles certain architecture at Chichén Itzá. At Chichén Itzá the Sotuta complex began around A.D. 850 – 900 and possibly lasted to A.D. 1150 – 1200. Both sites have changes in their ceramic complexes during their occupational heights.

Tula and Chichén Itzá have the imported elite tradeware, Tohil Plumbate, in common, as well as many other ceramic forms. This commonality of forms suggests that there was an exchange of information between the two sites, with ideas flowing in both directions. Common ceramic forms include those found in the ceramic ceremonial sub-complex of braziers, frying-pan censers, and open-work censers. Perhaps most significantly of all, both sites share common food preparation forms, grater bowls and comales, which are not found in other sites.

Obsidian

Both Chichén Itzá and Tula relied on obsidian for tools and weaponry, as did many parts of Mesoamerica (Healan 2007:429). And, as with many other locations in Mesoamerica, obsidian was not found locally in either location. Both Tula and Chichén Itzá received the majority of their obsidian from two sources in Mexico: Pachuca (green obsidian) and Ucareo (grey obsidian) (Healan 2007:435). 75% of the obsidian found at Chichén Itzá came from central and western Mexican sources (Braswell and Glascock 2003:38.) From the obsidian available for analysis at Chichén Itzá, it appears that the proportion of Ucareo obsidian to Pachuca obsidian is about 29:21 (Healan 2007:436.) This is approximately the same percentage usage as occurred at Tula during the Terminal Corral Phase, which Healan places at around A.D. 900 – 950; this might indicate that interaction between the two sites took place at that time. However, the Chichén Itzá samples are not chronologically identified (Healan 2007:436).

Braswell and Glascock (2003:39) put the proportion for Chichén Itzá at about 32:21, slightly different than Healan, but using the same obsidian data.

At Tula, obsidian usage shifted from 90 – 100% grey (almost all from Ucareo) during the initial, Prado, phase to approximately 75 – 80% green (predominantly Pachuca) during the Late Tollan phase (Healan 2007:434), a reversal of primary sources . No such shift has been documented for Chichén Itzá, but pertinent evidence is available from Isla Cerritos, a small island some 600 meters off the north coast of Yucatán (Figure 1). The main period of occupation at Isla Cerritos was Terminal Classic to Early Postclassic (about A.D. 750 to 1200) (Andrews et al 1989:355). Isla Cerritos served as the main trading outpost for Chichén Itzá (Robles Castellanos 1987:99; Andrews 1978:82). An obsidian sample was analyzed (n=65), and the majority of the samples, 48% (n=31) of the total, came from Pachuca. The next highest number, 28% (n=18) of the total, were from Ucareo (Andrews et al 1989:361). The samples were also broken down by time period and provenience. That breakdown indicated that during the Terminal Classic/Early Postclassic Chacpel/Jotuto Phase (A.D. 750 – 1200) 50% (n=7) of the samples were from Ucareo with 29% (n=4) being from Pachuca. The breakdown was reversed in the subsequent Jotuto period, (ca. A.D. 900 to 1200), when 45% (n=18) of the samples were sourced from Pachuca and 28% (n=11) came from Ucareo (Andrews et al 1989:361, Table 5). This shift from predominantly Ucareo to predominantly Pachuca mirrors what happened at Tula and takes place at approximately the same time period.

If the Tula elite did control the Central Mexican obsidian trade during the Terminal Classic and Early Postclassic (Andrews et al 1989:361) and if there was substantial trade between Chichén Itzá and Tula (see Andrews 1978; Andrews and Robles 1985), it could account

for the high quantities of Central Mexican obsidian at Isla Cerritos and Tula, and the similarities in percentages of obsidian obtained from the two main sources (Pachuca and Ucareo). At a minimum, even if Chichén Itzá received its Mexican obsidian from a variety of sources including Tula (Glascok and Braswell 2003:38-39), the high proportion of Mexican obsidian at Chichén Itzá supports the notion that there was a substantial trade connection between the central Mexican sources and Chichén Itzá.

Caches and Burial Offerings

Chichén Itzá

Caches, or foundation offerings, were found under many building foundations and altars at Chichén Itzá. According to Tozzer (1957:85), such cache offerings were common during the “Mexican period”. The first cache to be uncovered at Chichén Itzá was discovered by Augustus Le Plongeon in 1875 in the building called the Mausolum I (Str 2D3), beneath the first *chacmool* found at the site. The offering was contained in a stone vessel and consisted of two flat dishes, a jar, some jade, and two flints (Tozzer 1957:85).

The Temple of the Warriors (Str 2D8) contained two sets of offerings within the interior room corners. In the Northeast corner collapse rubble excavators found fragments of a sandstone disk (mirror back), perforated to be worn as a pendant and partly coated with a brown mineral substance, (Morris et al 1931:181-182). In the Northwest corner they located a cavity which contained a similar coated sandstone disk to that found in the other corner. Along with the second mirror back were chunks of a brownish-yellow material that matched the coating, two pieces of clear quartz, a tubular jadeite bead, a tubular red shell bead, and a disk-shaped pink shell bead (Morris et al 1931:182).

Another cache was found in a cavity on the north side of one of the columns in the outer room of the Temple of the Warriors. This cache consisted of eight cylindrical jars, six of which were intact and possibly deposited or hidden in the cavity after the Temple itself had fallen into disuse (Morris et al 1931:101-103).

A number of caches were found under sculptured daises in the colonnades of the Temple of the Warriors complex (Str 2D8). A cavity under the dais in the Northwest Colonnade (Str 2D8) was empty except for some clay vessel fragments (Morris et al 1931:57). A similar find was made among the ruins of the dais in the North Colonnade (Str 2D19), but 45 cm to the southwest of the center of this altar. Large rocks had been thrown on top of the deposit, which consisted of two sandstone disks (mirror backs), 11 pieces of jadeite (worked as beads with perforations), 4 pink shell beads, and 3 partial shell beads (Morris 1931:183-184). The Northeast Colonnade's (Str 3E1) sculptured dais, similar to that in the Northwest Colonnade, also contained a crypt that held a pottery disk (mirror back) with the same yellowish-brown coating on one side as the sandstone disks, two shaped jadeite beads, and two crudely worked white shell disks. Of the five altars examined in the colonnades, the three primary ones contained deposits and the secondary ones were empty (Morris et al 1931:185).

A cache was found in the interior room of the Temple of the Chacmool (Str 2D8) (Figure 10), which was covered by the Temple of the Warriors. In the line of the door-altar axis excavators found a sandstone jar that contained: shell beads; two jadeite beads and a carved jadeite face that formed a necklace; a jadeite ball; small bird bones; and, at the very bottom of the jar, a poorly preserved turquoise mosaic with the wooden backing almost worn away. The jar also held poorly preserved textile fragments (Morris et al 1931:186-189).

A number of offerings were found in the Caracol (Str 3C15). A stone-lined cist in the center of the first platform held an *olla* of Striated Porous Grey Ware, half filled with dirt. Inside the pot, mixed in with the earth, were fragments of a sandstone disk with a coating similar to the other sandstone disks found in the Temple of the Warriors and colonnades. Along with the sandstone disk pieces were: seven small pyrite mosaic fragments (probably part of the mirror attached to the disk); a stone button; a shell ornament; skeletal fragments of 41 short-tailed shrews; and, six human skull fragments (Ruppert 1935:84-86). Another Porous Grey Ware vessel was found in the tower, between the door jambs and below the sill of the southeast doorway. The vessel was in the form of a turtle, and it rested on an earlier floor and was sealed by a later floor. Inside were a total of eight beads: five shell, two stone, and one jadeite. Another jar of Porous Grey Ware, containing a shell bead, was found below a floor in the outer chamber within the west doorway. Also found near or in the west doorway were a jar of Red Lacquer Ware, a miniature jar of Porous Grey Ware, a shell bead, and a jadeite bead (Ruppert 1935:219-221). “Just under the lintel of the south doorway” was found a Porous Grey Ware figure of a jaguar. Another miniature Porous Grey Ware jar was found above the platform floor, east of the south doorway (Ruppert 1935:221). Brainerd analyzed the ceramics associated with the caches and determined that the vessels represented Early Florescent (Puuc), Early Mexican (A.D. 1000 – 1200 or Sotuta), and Late Mexican (A.D. 1300 – 1450) periods (Brainerd 1958:37).

Underneath the sunken patio of the Mercado (Str 3D11) was a masonry box partially full of dirt that contained 5 pieces of worked jadeite and 113 shell beads (Ruppert 1943:256). The Temple of the Wall Panels (Str 3C16) is one of the units in the Monjas group and is stylistically Mexican (Modified Florescent) (Ruppert 1931:120). An empty cist was found within the inner

room of the temple beneath a secondary bench. The cist had a sculptured cover and appeared to date from the construction of the temple Ruppert 1931:127).

On the floor of Mausoleum II (Str 2D2) a deposit was found that consisted of: a human skull; jade ear flares; two jade plaques; a collar of 175 shell beads; and, pyrite fragments appearing to be from a mosaic (Tozzer 1957:86). An internment in the structure contained a skull on top of a pyrite mosaic. Both disks (mosaic backs) were of sandstone (Tozzer 1957:86).

Finally, a foundation offering was found in the Castillo substructure (Str 2D5), in a stone box below the stairway. The box contained two mosaic plaques of turquoise, coral, and shell with images of serpent heads set on wooden backings that had disintegrated. The offering also contained: several carved jade pectorals; a jadeite head; jadeite beads and disks; and, two large stone knives (Marquina 1964:853-855). This formed the largest single offering deposit after the Sacred Cenote (Tozzer 1957:86).

Tula

There are fewer offerings to be analyzed from Tula. Most were found in the Palacio Quemado, Edificio 3. In Sala 1, an offering was found in a cylindrical, red-painted stone box in the south altar, and consisted of a carved jade plaque/pendant with red paint traces and 18 shell beads (Diehl 1989:24).

In Sala 2 the altar contained a similar offering of a red-painted cylindrical stone jar that held a jade plaque, 16 shell beads, and two other shells. An altar in Vestibulo 2 had another of these offerings. The best-known offering from Tula is that found by Acosta in Sala 2 under the chacmool found in front of the eastern altar. This offering consisted of: a green stone figurine; two shells; a quantity of shell beads; several sandstone disks (also found in Chichén Itzá); and,

pieces of jade and turquoise (Diehl 1989:25). The disks appear to have been backings a turquoise mosaic mirror and several pyrite mirrors (Mastache et al 2002:124).

Another offering was found in the center of the sunken patio in Sala 2 of the Palacio Quemado. It consisted of marine materials and included a “ceremonial garment made of hundreds of finely carved shell plaques” (Mastache et al 2002:123); an undecorated pyrite mirror had been placed on top. A later offering in the same location included a pyrite mirror with turquoise mosaic fire serpents (Mastache et al 2002:123-124).

Acosta reports that three vessels were found in the Zocaló of Tula that looked like they formed part of an offering. One was a plumbate pot in the form of a jaguar, with a modeled head and incised limbs (Acosta 1954:50).⁶⁵ At El Corral, 1.5 km northeast of Tula Grande, Acosta found a cache in the Adoratorio that contained 2 marine shells and a plumbate effigy of a bearded man’s face emerging from the jaws of a coyote or wolf. The outer surface of this effigy was covered in a mosaic of worked shell and stone (Diehl 1989:29).

Discussion

Again, as with the architecture and ceramics, there are several striking similarities in caches and offerings. The first is the location of caches; both locations had caches under chacmool sculptures. The contents of the offerings at the two sites also are remarkably congruent and distinctive, particularly the use of stone boxes combined with mirrors, many inlaid with turquoise and showing fire serpent iconography (Bey and Ringle 2007:403). Vessels in the form of a jaguar were also found at both sites, although the Tula pot is of uncertain provenience.

Burials

Chichén Itzá

Two burial chambers were found in the Monjas (Str 2D2) complex of Chichén Itzá: one built into the late terrace fill north of the Northeast Terrace and the other cut into the base of the Ball Court's east stairs. They may have been constructed at the time of the filling of those areas or later, as the vault caps of both are close to the surface. The contents of the Ball Court tomb consisted of a few fragments of a red ware plate and some human hand bones. The Northeast Terrace tomb had bone fragments of at least forty individuals, probably secondary burials, and two complete vases and two complete flat bowls (Bolles 1977:45, 237).

Offerings were also found among the burials in the High Priests Grave (so-named by Edward Thompson, it is now referred to as the Osario, Str 3C1). This structure consists of a pyramid with a shaft connecting the upper platform to a cave below the plaza level. The offerings were not placed in stone urns, and were part of the burials themselves. The burials are thought to be secondary, and date from the Middle to Late Postclassic time (Schmidt 2007:173, 170). In addition to ceramic vessels (red tripod bowls), Edward Thompson encountered: copal; copper bells; crystal beads; incense burners; flints; a large alabaster-white vessel containing jade beads, pendants, and a jade plaque (Willard 1926:244-247, 256-258). There were at least seven burials in the shaft as well as skeletal remains within the cave below the shaft (Thompson and Thompson 1938:10,52).

Structure 3C4, at the entrance to the Osario group, is a burial structure that contains three vaulted chambers that were probably originally used for secondary burials (Schmidt 2007:171-172). Edward H. Thompson discovered these tombs at the end of the 19th century. The first two

tombs had been disturbed; the third had collapsed. The first tomb he encountered contained portions of two male skeletons, 3 tripod vessels, and a bowl. The second tomb also contained: two skeletons; as well as 2 crushed vessels; 2 jade beads; a copper bell; a rock crystal bead; and, shell ornaments that might have formed part of a mask. From the collapsed tomb Thompson extracted two small animal shaped vases, similar to those recovered from Las Monjas, plus a broken tripod vase (Ruppert 1952:163). Lack of specific information on the ceramics makes it difficult to date these burials. But, Brainerd dated similar animal effigies from the Las Monjas burials to his Late Mexican phase (Brainerd 1958:37), so they are probably Postclassic.

J. Eric S. Thompson also discovered a burial in a chultun (Str 5C1) in the Initial Series Group. It consisted of the remains of an adult male, resting on a mass of garbage that included ceramic sherds and animal bones. One sherd of Decorated Slate Ware was near the skull (Ruppert 1952:159). Ruppert (1952) also reports a vaulted tomb in the terrace of a temple between the Casa Redonda and the Hacienda Chichén. Also, in the doorway of a sweathouse (Str 3E3) he found human skull fragments, along with a portion of a jaw and ribs (Ruppert 1952:82, 149).

In addition to caches, Ruppert also found skeletal remains in the Caracol (Str 3C5) in the fill of the lower platform; these remains were scattered across an area approximately four meters square and 4.8 meters deep. The remains were of children and young adults, and were scattered into the fill at the time the platform was built (Ruppert 1935:34-35). Along with the skeleton fragments, he recovered: 5,628 shell beads; one pellet of pitch; one piece of a pyrite mosaic; one jadeite button; two green stone beads; one flat piece of shell; a pearl; a green stone bead that may have been burnt; one burned deer toe bone; one green stone pendant; 12 pieces of sandstone disk;

two jadeite beads; and, one chipped grey stone point (Ruppert 1935:36). Ruppert also found remains in the fill of the rectangular platform of the Caracol. There were two types of burials: cremation and inhumation. The cremated remains were found inside two ollas of Striated Porous Grey Ware. One olla also contained two obsidian flakes, the other had no other material besides dirt and burnt bone fragments (Ruppert 1935:119). The uncremated remains were found buried in fill at a depth ranging from 17 to 65 cm between the outer circular platform and the masonry block that divided the upper part of the stairway. At least 14 skulls and 18 mandibles were found, the skulls arranged in four rows. From the placement of the remains he inferred that it was a reburial and analysis indicated that there were remains of 24 individuals. The bones were in association with fragments of a Porous Grey Ware incense burner and deer bones (Ruppert 1935:120-123). Brainerd does not offer any information as to the date of the ceramics.

Recently discovered burials/offerings include the “elaborate offering” (Schmidt 2003:21) found directly under the floor in the Temple of the Owls (Str 5C7); it consisted of a tiny “recámara” (chamber or cist) that contained a skeleton, two fragments of an ocarina, and fragments of vessel decoration, probably from Sotuta ceramics. Associated with the skeleton material was a lidded cist, also below the platform, which contained: two elaborately worked stone cubes that appeared to be pieces of what might have been a red-painted box; some unidentified bones; and, two round jade beads. This offering originally was placed at the same time as the platform floor was finished and very shortly after the construction of the edifice (Schmidt 2003:21-22).

A nearby *chultun* (5C), one of several excavated during the 2000-2002 field seasons, contained the skeletal remains of six people, along with ceramics from the Sotuta and Hocaba

complexes. Also found in the *chultun* were two small carved stone figures of a fish and a turtle, below which was a round mirror of pyrite pieces glued to a disk (Schmidt 2003:23, 191).

Another *chultun* contained a quantity of obsidian, flint, green stone, turquoise, pearls, shells, and other marine materials. The majority of the ceramics recovered from the *chultun* excavation were Sotuta complex (Gonzales de la Mata 2003:67-92). Human remains were found in some of the excavated *chultuns*, along with the first complete *comal* found at Chichén Itzá (Gonzales de la Mata 2003:76).

Excavation of the Platform of the Turtles (Str 5C17), a structure in the shape of a turtle, disclosed offerings and burials. The principle cache was inside of a stone box and contained a vessel of the Tinum type with 15 very fine flint points (the same as those found by Le Plongeon). Two burials were found that had been placed prior to construction of the “turtle” features around the round platform. Accompanying these burials were Sotuta complex ceramic fragments and a necklace of approximately 900 beads of a blue substance, possibly azurite or false turquoise (Schmidt 2003:28-29).

The most recently published burials at Chichén Itzá were found between Structures 5C17 and 5C33/34/35 in the Group of the Initial Series during the 2000-2002 field seasons. These burials were located in the fill of the grand platform, were sealed by a floor, and were not associated with cists or tombs (Schmidt 2002:31). The majority of the burials were associated with offerings that included ceramics, shell, lithics, and metal (copper bells). The ceramics belonged to either the Motul Phase, Late Classic (A.D. 600-800) or the Sotuta Phase, Terminal Classic (A.D. 850-1150); most of the 12 burials recovered were primary (Canul 2003:47-54).

Diving and dredging Chichén Itzá's Sacred Cenote recovered human remains (Willard 1926:114-116) from some 42 individuals (Hooten 1940:273). In addition to the skeletal fragments, human and animal teeth (worked and/or perforated), as well as a human skull incense burner were recovered (Coggins 1992:142-144). Also recovered were works of gold and copper, jades, textiles, ceramics, basketry, copal, objects of wood, shell, bone (animal as well as human, worked and unworked, some incised with glyphs), and stone. The objects ranged from high-status elite items (not only from the lowland Maya area, but from the highland Maya area, central Mexico, and even Honduras), to things associated with low social rank. The time span of use is suggested to be from the Late Classic to the Late Postclassic, with the majority of activity occurring within the Late Classic, Terminal Classic, and Early Postclassic (Coggins 1992:142-143).

Tula

In Tula Grande Acosta found some burials in Montículo B (Sodi Miranda and Solis Olguín 1987:24), as well as in the Adoratorio, where he encountered a burial associated with a plumbate pot in the shape of a jaguar with a modeled head (Sodi Miranda and Solis Olguín 1987:25).

In a mound near the Juego de Pelota two burials were encountered, one of skeletons only and the second of burned remains in an olla. It appeared that the burials were contemporaneous and could be related to the Aztec re-occupation (Sodi Miranda and Solis Olguín 1987:34). Acosta also found an Aztec burial beneath the Adoratorio, which was comprised of a secondarily interred individual (Mastache et al 2002:132).

Excavation and restoration of a pyramid at El Corral, 1.5 km northeast of Tula, resulted in finding two burials inside an altar, one of which was a secondary interment of a juvenile (Diehl 1989:28). Some ten meters north of that pyramid, while excavating a building designated as Edificio 1, Acosta encountered an open patio with eight burials. Many of them were associated with grave goods; other vessels were on or buried in the patio floor (Diehl 1989:29; see Acosta 1974:27-50).

Also in the urban zone, but outside the monumental precinct, Acosta excavated along the edges of a brackish marsh, *El Salitre*, looking for a cemetery. He did locate ten burials that were both primary and secondary. Six of the burials had grave goods, but only one, that of an infant, had Toltec ceramics, a Mazapa tripod bowl. The remainder of the burials with grave goods contained Aztec ceramics (Acosta 1945:48-49).

The Missouri Tula project, excavating in the El Canal area, found some burials within the house groups. In the Central Group, two infant burials were found in a room of one of the houses. One burial was in a defined pit that penetrated the floor; it contained several small vessels, a figurine, and two obsidian trilobal eccentrics; a bowl also had been placed in the pit above the burial. The second burial was not in a defined pit and had no associated goods. Both burials are assumed to date from the occupation of the house (Healan 1989:102). Another house in the same group contained two shallow burials in the subflooring, covered by plaster. No grave goods were found with the burials, which were in a poor state of preservation due to erosion (Healan 1989:111-112). A “burial” also was encountered in the courtyard of the Central Group beneath the west steps. This “burial” consisted of one human femur with numerous fibulae and tibiae laid horizontally and parallel to the courtyard walls; some of the bones were articulated.

The location suggests a dedicatory offering, but the disturbance of the courtyard floor above the cache implies the cache postdates the courtyard construction (Healan 1989:126-127). The altar in this courtyard also showed evidence of having been used for burials; human teeth were found in an intrusive pit on the altar's east side. The altar had been destroyed, however, probably shortly after abandonment of the group (Healan 1989:125-126). Similar altars have been found in Tula - five in all - in the same general area. Altars in Tula Grande, on the other hand, are different in form and did not contain burials, though some did contain caches (Healan 1989:147). Occupation in these groups is thought to have begun late in the Tollan phase and to have had a short (one to two century) duration (Healan 1989:163).

Excavation at El Corral, about half a kilometer west of the Canal location, disclosed a quantity of human bones - the remains of seven individuals - on the floors of two rooms and a passageway. The concentration and location of these bones implies that these individuals died in the buildings and were left there (or were placed there), until subsequently scattered by human or animal activity; cannibalism may also be implied (Mandeville and Healan 1989:199). These buildings appear to have been occupied slightly earlier than those at Canal, with ceramics from the Corral and Tollan phases (Mandeville and Healan 1989:198).

Discussion

There is not a lot of burial information that can be compared between Chichén Itzá and Tula. Both did have burials associated with monumental architecture; both locations had primary and secondary interments; grave goods including shell and jade at both sites. At both Tula and Chichén Itzá there were burials in areas outside the monumental epicenter, sometimes occurring in platforms or courtyards of building groups. And, in both locations there were

multiple interments in some areas. However, the burial data is insufficient to establish a shared connection between the two sites, unless the existence of cremations in jars at both sites is significant.

Settlement and Dating

Chichén Itzá

Excavations have produced some early ceramics (from Preclassic and Early Classic dates) within the mapped area of Chichén Itzá, but not in sufficient quantity to support a major settlement at the site during those earlier periods. Schmidt proposes a chronology in which Proto-Pizarra (Proto-Slateware, or what is the Motul phase) is the Late Classic complex (A.D. 600-850). The few sherds of Cehpech he would provisionally assign to A.D. 800 – 850, with Sotuta taking over after that and lasting well into the 12th century (Schmidt 2007:157; see also Cobos 2007:318). Based on this ceramic chronology, it would appear that Chichén Itzá was sparsely occupied prior to A.D. 800 – 850 (Schmidt 2007:194).

The stratigraphic sequence from Isla Cerritos, the port for Chichén Itzá (see Gonzalez de la Mata and Andrews 1998:457-458) agrees with this timeframe. At Isla Cerritos ceramics from the Cehpech/Chacpel complex co-existed with those of the Jotuto/Sotuta complex prior to A.D. 900, with a majority presence of Jotuto ceramics after A.D. 900 that is associated with the Late Sotuta phase at Chichén Itzá (Cobos 2007:326). Robles Castellanos, in his ceramic sequence for Isla Cerritos, places the Chacpel complex from A.D. 700 to 900, and places Jotuto at A.D. 850 to 1150/1200 (Robles Castellanos 1987:104-105). Andrews and Robles Castellanos associate Sotuta ceramics with Chichén Itzá and use the presence of Sotuta ceramics, plus architectural similarities, to suggest that Chichén Itzá controlled coastal sites, such as Isla Cerritos. This

distribution indicates that Chichén Itzá used coastal resources and engaged in long-distance trade (Andrews and Robles 1985:68). Other evidence for the expansive trade network in which Chichén Itzá was involved includes the similarities in obsidian with Tula and Isla Cerritos (and the presence of obsidian from non-local sources), the tradewares Tohil Plumbate and Silho Fine Orange, and the non-local artifacts found in the Sacred Cenote (see Sharer and Traxler 2006:570-580 for a discussion of trade networks at Chichén Itzá.)

Sotuta ceramics also outnumber Cehpech ceramics in the Chikinchel region to the northwest of Chichén Itzá. This area borders the coast and includes areas of salt production. It is part of a regional settlement pattern that includes minor sites between Chichén Itzá and the port of Isla Cerritos, as well as the saltworks at Emal (Kepecs 1998:127).

Yula, a small site approximately 5 km south of the epicenter of Chichén Itzá, also contains a large quantity of Sotuta ceramics. Out of a total of 14,930 Terminal Classic (A.D. 600/700 – 1000) sherds recovered, 14,408 were Sotuta and 522 were Cehpech (Anderson 1998:159). This verifies not only the overlap of the two complexes, but also the regionalization of Chichén Itzá during the Terminal Classic. Anderson also notes the presence of plumbate and fine orange ceramics, green obsidian, and jade as further evidence of ties to Chichén Itzá (Anderson 1998:158). These elite trade goods also suggest that Yula participated in a trade network controlled by Chichén Itzá. Three hieroglyphic dates have been recovered from Yula: 10.2.4.1 2 Imix 4 Mak, which corresponds to September 6, 873; 10.2.4.8.4 3 Eb 10 Pop (January 7, 874); and, 10.2.4.8.12 (January 14, 874) (Anderson 1998:157). If Yula was associated with Chichén Itzá, as seems to be indicated in the pottery, these dates become important in verifying a chronology for occupation.

The written record at Chichén Itzá provides hieroglyphic dates on monuments or lintels. The only long count date from Chichén Itzá is from the Initial Series Lintel, 10.2.9.1.9 9 Muluk 7 Sak or July 26, 878. It has been suggested that the lintel was actually part of a different building, perhaps the Temple of the Phalli (Grube and Krochock 2007:237). There is a consensus among scholars as to the readings of the remainder of the dates, the majority of which are in the Tun Ajaw or Katun Ajaw Calendar Round form (Thompson 1937:1-2, 16-17). The earliest date found at Chichén Itzá comes from the Temple of the Hieroglyphic Jambs. It is a Tun Ajaw or Calendar Round date, 9 Ben 1 Sak; based on additional calendric inferences on the jambs, Grube and Krochock (2007) propose that the full date is 10.0.2.7.13 9 Ben 1 Sak or August 4, 832. An alternative, 52 years later, (10.2.14.7.13), would be July 22, 884. It is thought that the text refers to a building dedication (Grube and Krochock 2007:212-213). The building in which it was found is of the gallery-patio type, which has been assigned to the “Mexican” architectural style (Ruppert 1950:254 in Grube and Krochock 2007:212). With one exception, all of the other dates located at Chichén Itzá fall between A.D. 832 and A.D. 897 (Cobos 2007:327-328). The earliest text with a secure date at Chichén Itzá is from the Casa Colorada glyph band and is A.D. 869 (Grube and Krochock 2007:214). This is consistent with the dates found at Yula.

A recently reconstructed stela, Stela 2 in the Casa Colorada plaza, refers to two dates that Schmidt places within the Katuns ending 10.3.0.0.0 (A.D. 869-889) and 10.4.0.0.0 (A.D. 889 – 909) (Schmidt 2007:161). The latest date found at Chichén Itzá is on a pillar in the Osario (Str 3C1) and is thought to be A.D. 998 (Schmidt 2007:161). This places hieroglyphic writing at Chichén Itzá within a 170 span.

Tula

The Missouri Tula Project conducted a surface survey of the urban zone at Tula to obtain settlement data. Their results showed the earliest ceramics found in significant quantities were from the Coyotlatelco ceramic sphere, correlating with the Prado and Corral phases of occupation at Tula (Healan and Stoutamire 1989:209). The Prado complex was found almost exclusively at Tula Chico, in the lowest levels. The Corral complex is also associated with Tula Chico and this indicates that Tula Chico was the earliest ceremonial center in the Tula region, occupied during the Coyotlatelco phase (Healan and Stoutamire 1989:234). The arrangement of buildings at Tula Chico is similar to that at Tula Grande (Matos 1978:173,176). It is estimated that the area of Tula Chico was between 3 and 5 sq km (Healan and Stoutamire 1989:234).

The Tollan phase settlement area is estimated to be a minimum of 12 sq km, with an estimated population of 60,000 (Healan and Stoutamire 1989:235). The majority of ceramics found in the survey are from the Tollan ceramic sphere, linked to Tula's apogee (Healan and Stoutamire 1989:209). This population estimate sharply contrasts with the prevailing notion that Tula was a modest settlement, a preconception largely based on the size and limited architecture of its epicenter (Healan et al 1989:239). The settlement survey also indicates that not only did the urban center move to Tula Grande during the Tollan phase, but that there also was expansion into the south area as well, probably at the beginning of the Tollan phase. During the first half of the Tollan phase, Tula may have increased its size several times over, but it did not reach its full size until the second half of its history, when the Canal location was settled (Healan et al 1989:244).

Discussion

While Chichén Itzá's substantial occupation began in the 9th century, Tula was occupied prior to that time. However, at Tula the occupation shifted in the 10th century, at the beginning of the Tollan phase, to Tula Grande. And, at both Tula and Chichén Itzá there was a re-orientation of the monumental site centers during the height of occupation. The ceramics also underwent modification during the two centers' apogees. There is ample evidence of long-distance trade taking place at both sites and both Tula and Chichén Itzá expanded during their apogees (Tollan phase and Sotuta phase, respectively).

CONCLUSION

Those scholars who maintain that migration cannot be an explanation for the similarities between Chichén Itzá and Tula (Gillespie 2007:102) rely on an outdated definition of migration. Although generally discredited, not all current scholarship has discounted migration in the case of Chichén Itzá. In the case of Chichén Itzá, there is evidence that its explosive growth in the 9th century was due to the arrival of non-local people as opposed to a gradual population increase (Kowalski 2007:252). Such people may have come from Tula or from elsewhere. While notions of a Yucatán conquest by an outside group of people seem to have evaporated; “we should not discount the idea that some central Mexicans from Tula may have visited and even settled at the site” (Kowalski 2007:276).

When migration is understood as a process that can be modeled, much like a world systems model or a conquest model, it becomes easier to analyze the relationship between Chichén Itzá and Tula and reach some conclusions. The objections to migration as an explanation of the Tula-Chichén interaction can be attributed to the lack of a good understanding of the process of migration. However, starting with an explicit model of migration and evaluating the archaeological criteria, one can avoid speculation (Smith 2007:595). Migration should to be addressed critically. Ethnohistoric accounts should be viewed skeptically and not automatically taken as evidence of migration (Smith 2007:593). Various models, such as world systems (Kepecs 2003, 2007), have already been applied to explain the similarities between Chichén Itzá and Tula. The model here proposed is that of elite dominance migration, as defined by Renfrew (1987:131-133).

Examining some of the components of the elite dominance model, we turn first to the existence of advance contact. In the case of Chichén Itzá advance contact took the form of the long-distance trade that brought foreign goods to the sites, such as obsidian, tradeware ceramics of Tohil Plumbate and Silho Fine Orange, and jade (Andrews and Robles 1985:68). Minimally, obsidian sourcing suggests that Chichén Itzá had strong linkages to Central Mexico (Braswell 2003). As a trading partner, Chichén Itzá would have supplied salt to other parts of Mesoamerica and beyond. It has been suggested that Tula controlled all (Andrews et al 1989:361) or part (Braswell and Glascock 2003:38-39) of the central Mexican obsidian trade to Chichén Itzá. If obsidian trade was the root of the initial penetration, it is logical to assume that the initial contact was from Tula to Chichén Itzá. Further research may show that the first contact was from Chichén Itzá to Tula or even from a third site to one or the other.

A second aspect in the elite dominance migration model is migration to a specific center. In the case at hand, the center would have been Chichén Itzá, a city that had a very small Late Classic population, but that expanded enormously beginning in the 9th century (Kowalski 2007:252). The INAH Atlas surveys show substantial population growth in northern Yucatán during Late and Terminal Classic times (Andrews and Robles 1985:66; see also Kurjack and Andrews V 1976). There is evidence of population at Chichén Itzá in the Late Classic (Motul Phase, A.D. 600 – 800), but not in the numbers of the subsequent Sotuta Phase (Schmidt 2007:194).

A third aspect of elite dominance migration is also present: the maintenance of a connection to the originating population, through a network and/or through return migration. Chichén Itzá maintained and enlarged its trade network during the Terminal Classic period A.D.

950 – 1150 (Andrews and Robles C.1985:68). Evidence shows that the small site of Isla Cerritos expanded during the Jotuto/Sotuta phase, as it became an increasingly important trade port for Chichén Itzá (Cobos 2007:326). Smaller sites between Chichén Itzá and Isla Cerritos grew as the salt trade took on importance (Kepecs 1998:127). A maintained connection can also be seen in the shared ritual items, such as *chacmools*, and the similarity in art styles.

The return migration aspect also addresses the arguments made by Kubler (1962:288) and others that migration and influence ran from Chichén Itzá to Tula. In the elite dominance migration model, with its component of return migration and shared network, ideas and influence flowed in both directions. The initial penetration, by a merchant-class elite, may have been through obsidian trade or another avenue. Ultimately, those first contacts and the resulting information streams back and forth led to settlement at Chichén Itzá of people who brought with them their forms of cooking vessels (comales and grater bowls) and ritual ceramics.

The fourth component of elite dominance migration, a spatial concentration of the incoming population, is a bit more problematic. There is simply insufficient data to discern an enclave of foreigners at Chichén Itzá, such as might be expected in a migration. We have seen an expansion of population in Chichén Itzá in the Terminal Classic, as well as development of secondary sites as trade nodes or ports. But, so far, it is not possible to determine if the incoming population concentrated its dwellings in one or more locations, and scholars have yet to suggest an ethnic Toltec enclave at Chichén Itzá (Smith 2007:594). What we do see, at both Chichén Itzá and Tula, is a reconfiguration of the site center in the Terminal Classic, a reorientation both at Tula (Mastache et al 2002:82) and at Chichén Itzá at the end of the 9th century (Cobos 2007:334). This might be the elite version of spatial concentration.

The fifth marker of elite dominance migration is the migration of a selected population. In this model, that population would have been an elite group of traders. Although the idea of a merchant diaspora has never been explored for northern Yucatán (Smith 2007:598), it is not out of the question to suggest that a group of elite merchants moved from a core area (perhaps Tula) to the foreign area of Chichén Itzá to better organize long-distance trade or to take advantage of the commercial opportunities there. This aspect of migration is asking the “pull” question, what is pulling these particular people to Chichén Itzá? To put the question another way, what is the positive allure of Chichén Itzá? The answer might be an economic attraction – elite traders or merchants pushed to expand their trade longer distances are pulled to an expanding, known trading destination (see Anthony 1990:899-901 for a discussion of push-pull factors.)

Alternatively, it might also have been to spread the religious cult of the feathered serpent, as suggested by Bey and Ringle (see Bey and Ringle 2007; Ringle et al 1998). Such a religious spread would also account for the initial contact (missionary) and the continued network. It would also help explain the striking similarities in iconography and sculpture found at Chichén Itzá and Tula, and would also explain the similarities in ritual items. And, a military elite migration is also possible, given the nature and amount of artwork with a military theme.

Determining the cause of migration is the push/pull question. This query also is closely related to the selected population aspect. As mentioned above, the most likely cause in the case of Chichén Itzá and Tula was a trade nexus. Another possible cause is the spread of the religious cult of Quetzalcoatl.

The final aspect of the elite dominance migration model is change in the material record. There is much evidence of change at both Chichén Itzá and Tula, as discussed above. The two

most significant points about the changes are the striking similarities, not only in art, but in caching practices, architecture, artifact forms, and other elite goods. The second curious point is the spatial-temporal shift that occurs in both sites. At both Chichén Itzá and Tula, scholars have defined early and late phases in the Terminal Classic ceramic complexes: Early and Late Sotuta at Chichén (Cobos 2007) and Early and Late Tollan at Tula (Mastache et al). Architecturally, the Chichén shift is seen in the reorientation of the epicenter, with a late concentration on the *Gran Nivelación* at Chichén. At Tula an architectural shift occurred from Tula Chico to Tula Grande, with a subsequent reorientation of Tula Grande. All of these changes took place in the 10th century and, while they cannot be dated with the precision we would like, there was overlap.

Among the specific similarities between Chichén Itzá and Tula, in addition to the art and iconography, are the similarities in architectural style. The Pyramid of the Warriors Complex, including the Temple of the Chac Mool, at Chichén Itzá bears a strong resemblance to Pyramid B at Tula. The three salas (including the Palacio Quemado) have much in common with the Mercado at Chichén Itzá. Both sites make use of the gallery-patio complex, and both sites have a number of buildings with columns. Both sites have large numbers of free-standing *chacmool* sculptures, rare in other Mesoamerican locations. In both centers Atlantean sculptures have been found as discreet columns and roof supports. In addition to the Atlanteans, other common forms of decoration and sculpture include feathered serpents as well as jaguar and eagle motifs.

Similarities also exist in pottery types, with correspondences in the ceremonial sub-complexes (frying-pan censers, braziers, and open-work censers), grater bowls and comales, tobacco pipes, and similarities in types that imitate fine orange wares. Both sites also have a preponderance of the tradeware Tohil Plumbate. It is significant that Chichén Itzá shows a

change within the Sotuta phase, and late Sotuta phase ceramics have more resemblance to late Tollan ceramics in form (Cobos 2007:325; Mastache et al 2002:48-49).

Both sites imported obsidian from Central Mexico. This makes sense for Tula, given its proximity to the sources (see Figure 1). But Chichén Itzá received 75% of its obsidian from these distant central and western Mexican sources (Glascock and Braswell 2003:38), and the proportions of Ucareo and Pachuca obsidian (the two most prevalent Mexican sources) are similar for Tula and Chichén Itzá (Healan 2007:435). This suggests a strong, continuing contact between the two sites. Additionally, Isla Cerritos, the main trading port of Chichén Itzá (Robles Castellanos 1987:99; Andrews 1978:82) and Tula displayed a similar shift in proportions of Ucareo and Pachuca obsidian during the 9th and 10th centuries (Healan 2007:434), which further supports the ongoing interaction between Tula and Chichén Itzá. A close trading relationship provides the necessary information network for continued migration between the two sites.

Some striking correlations are found in the caching practices of the two sites. While both sites exhibit a Mesoamerican-wide practice of placing caches under altars, both shared in the placement of caches under *chacmools*. The use of stone containers at both sites is also unusual and while the contents may have general similarities with other Mesoamerican cache practices (D. Chase and A. Chase 1998), the iconographic use of turquoise serpent imagery in mosaic mirrors (Kristan-Graham 2007:563) at both sites is also highly unusual.

One fallacy that must be disposed of when speaking of migration is the idea that it would have been an abrupt, one-time occurrence. While there are situations in which a large group of people will move to a new location en mass, migration can also take place over a longer period of time and constitute a gradual process of infiltration (Burmeister 2000:540). An elite

dominance model of migration begins with an initial penetration by traders, missionaries, and/or military personnel. The network or return migration is the vehicle by which information is exchanged between the originating area and the new area. This information exchange about the route, destination, and experience encourages further migration. The first immigrants follow the original traders to the center. Eventually, the migration area may widen outside the center (Burmeister 2000:544). Return migration also helps explain the shared art and architectural styles over a period of time. Return migration, or the migration network, is a vehicle by which continued interaction between two sites takes place; manifested in shared art, architecture, rituals, and artifacts.

Of the three types of elite dominance migration mentioned by Burmeister - military, trade, missionary - I propose that the trade model is the most likely to have taken place at Chichén Itzá. There is also a possibility that a religious migration took place, but aside from the iconography similarities, this is more difficult to discern. Trade goods such as obsidian, jade, metals, salt, and elite tradewares traveled between Chichén Itzá, Tula, and other locations in Mesoamerica. While an elite dominance military migration is also possible, especially when the iconography of Chichén Itzá is considered, it appears less likely than a trade model. The distance between the two sites argues against a military migration (see A.Chase and D. Chase 1998:14 for a discussion of marching distances and polity size). Also, the same iconography that has Central Mexican images contains strong Maya elements as well. Until more information is forthcoming, a military elite migration is not provable and probably did not take place (Maldonado and Kurjack 1993:100-101).

There are sufficient similarities to suggest that a relationship existed between Tula and Chichén Itzá that involved elite dominance migration. While the temporal overlap in architecture is not very long, there is an overlap of fifty to one hundred years, beginning in the early 10th century, more than enough time for a migration to have taken place. Major population expansions occurred in both locations, beginning in the second half of the 9th century. Finally, the defining ceramic complexes for both sites overlap - Chichén Itzá's Sotuta complex from ca. A.D. 850 – 1150 and Tula's Tollan from ca. A.D. 900 – 1150. This is the necessary chronological correlation and can be refined as further research is done at both sites.

I would put forth two possible migration routes, both based on long distance trade. The first is the traditional Tula to Chichén Itzá migration, taking place in the late 9th and early 10th centuries about the same time that Tula Grande was being established and the Temple of the Chacmool was being erected. Tula Chico had been abandoned and while Tula Grande was being established, it is also possible that a small contingent of merchants set out to establish a satellite outpost in far-off Chichén Itzá. As Tula changed and expanded, it may have also expanded to the west.

The second possibility is a variation on the "Putún" hypothesis presented by Thompson (1970:12-22) and Andrews (1990:259). It is possible that the origination of the migration to Chichén Itzá was not Tula, but the Chontalpa region of the Gulf of Tabasco. The so-called Putún or Chontal Maya may have intermarried with the central Mexicans (Thompson 1990:25) and gradually deployed up the western coast of Yucatán (Andrews and Robles 1985:64). It is logical that a trade node near modern-day Xicalango, with easy access to the major rivers (Usumacinta and Grijalva), could have been used by any number of Central Mexican polities, including Tula.

Another potential migration route, therefore, would have been from this Gulf of Tabasco trade port to both Chichén Itzá and Tula, carrying the central Mexican architecture and artifact forms along with it (Figure 11). At the very least, this trade node was probably a stop along the migration route that followed the trade routes by land and sea. However, such a model still awaits archaeological identification.

By defining migration in terms of an on-going process, it is possible to develop and test migration models to pre-historic sites in Mesoamerica. Borrowing from Colin Renfrew's (1987) linguistic studies of pre-historic societies, an elite-dominance migration model can be developed. A series of queries can be made of the sending and receiving populations to determine if the features of such a migration exist, and to narrow down the type of elite-dominance migration: military; missionary; or, commercial (trade). In the instant case the sending population is Tula, Hidalgo and the receiving population is Chichén Itzá, Yucatán. Multiple changes in the archaeological record at both sites have been identified to support the hypothesis of an elite-dominance trade-based migration from Tula to Chichén Itzá.

Future Research

In order to further explore the possibilities of migration to Chichén Itzá from Tula or elsewhere, it will be necessary to try to tie architecture to ceramics at Chichén Itzá. A rigorous ceramic sequence is needed at both locations in order to firmly date the changes that are taking place in architecture and art. At Chichén Itzá more settlement studies are needed to try to discern which parts of the site were occupied at different points of time, to discern when these occupations began and ended, and to determine how far occupation at the site extended into the local region.

At Tula more excavation needs to be done at Tula Chico, to try to determine its complete occupational sequence and to more accurately correlate its ceramic sequence with architectural construction. The architecture at Tula Chico should be investigated and described thoroughly, to allow comparisons between Tula Chico and Tula Grande. This will help fill in some of the gaps of the occupational shift between Tula Chico and Tula Grande.

Finally, the Chontalpa region needs to be studied, to try to pinpoint the location of trade ports, their periods of occupancy, and who actually lived there. Ceramics in that region should be studied in order to determine if there are similarities in form between the coastal region, Tula, and Chichén Itzá. Obsidian should be located and sourced, to see if there are connections with Tula, Chichén Itzá, and other central Mexican sources. Art and architecture should be catalogued for comparisons to other Mesoamerican sites. Development of these “data banks” will assist in future studies of migration, trade, and occupation throughout the region.

By focusing on a specific model of migration, studies can be designed to fill in the gaps in archaeological information and to determine with a greater degree of certainty whether migration did or did not play a role in the history of Chichén Itzá. Moving away from the specific sites of Tula and Chichén Itzá, an elite-dominance migration model can be tested in other pre-historic sites across Mesoamerica and beyond. Elite dominance models have already been suggested for such diverse areas as Anglo-Saxon Britain (Burmeister 2000) and Renfrew’s (1987) Indo-European language study. Mesoamerican sites that have been extensively and intensively explored, such as Caracol, Belize and Copán, Honduras, are excellent candidates for the application of this type of migration model. Caracol, with its military history, would be a

logical originating population for a military elite dominance migration of a neighboring site. Copán, with its suggestions of a founder from far away, is a possible recipient population.

Migration models will be particularly helpful in conjunction with settlement and population studies. I have suggested one model, a long-distance, elite dominance situation. There are a number of other migration models in the literature (such as Ammerman and Cavalli-Sforza's "wave-of-advance" [1984:63-84], a short-distance model), and all have their unique signatures. Where there is a change in settlement patterns or a growth spurt in population beyond natural parameters, migration should be explored as a possible factor.

By re-defining migration as a process, and developing models of migration activity, migration in the archaeological record can be rescued from obscurity and given its rightful place in the study of pre-historic societies. In this study a dynamic model of elite dominance migration has been developed and applied to the archaeological record of Chichén Itzá, Yucatán and Tula, Hidalgo. Looking at multiple lines of information: architectural; ceramic; obsidian; burial; and, caching; a process of elite dominance migration has been discerned between Chichén Itzá and Tula, taking place in the 9th and 10th centuries. Further studies can help refine both the details of the migration and the model itself; and migration as a process can be explored at other archaeological sites, in Mesoamerica and beyond.

APPENDIX A: FIGURES

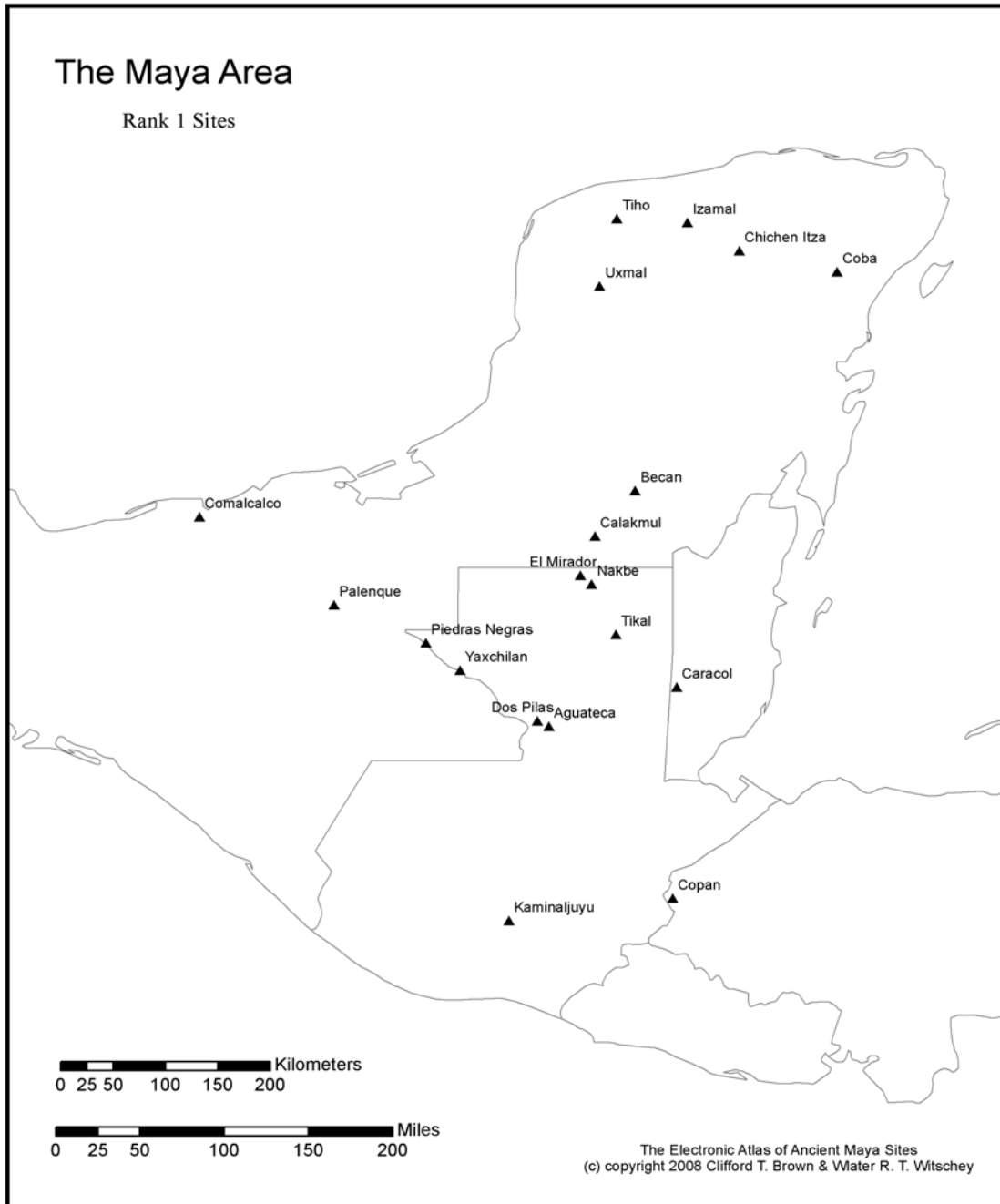


Figure 1: Map of Maya Area - Relative Location of Chichen Itza (after Brown and Witschey, 2008)

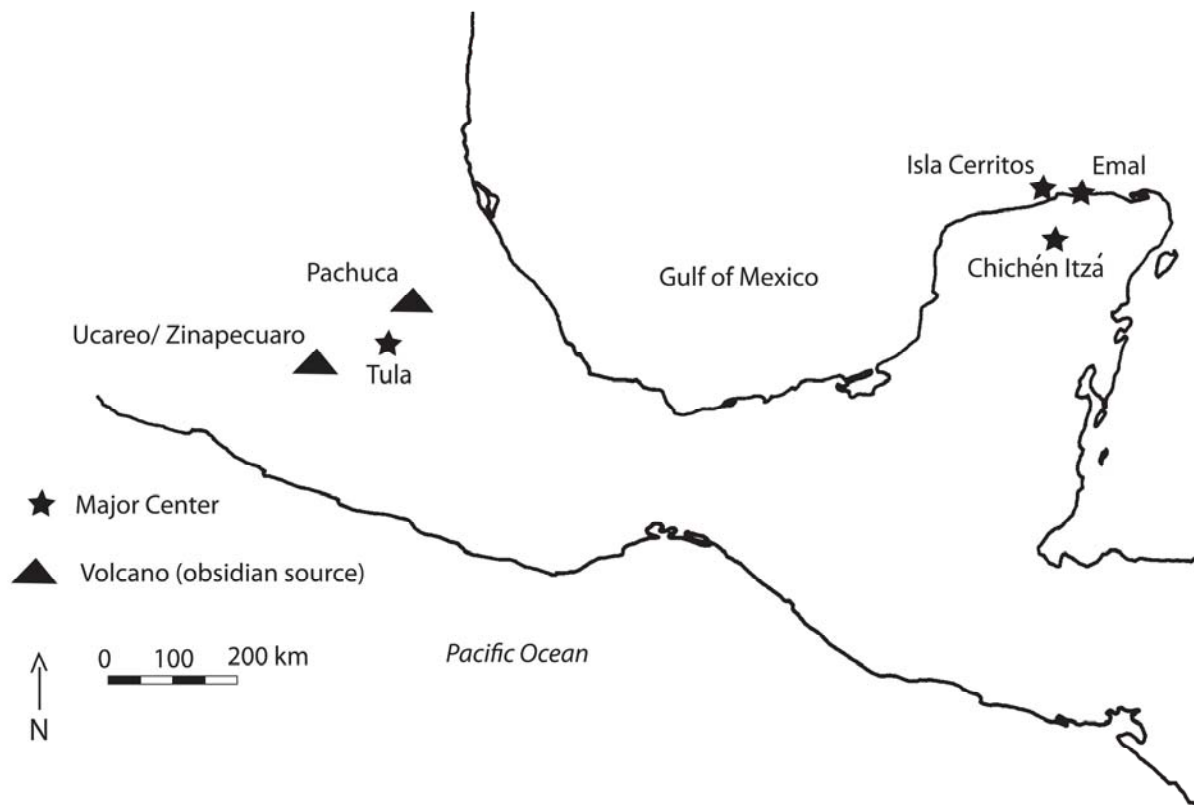


Figure 2: Map of Mesoamerica Showing Location of Trade Centers and Obsidian Sources (drawn by L. Martindale Johnson, after Kepecs 2007:133)

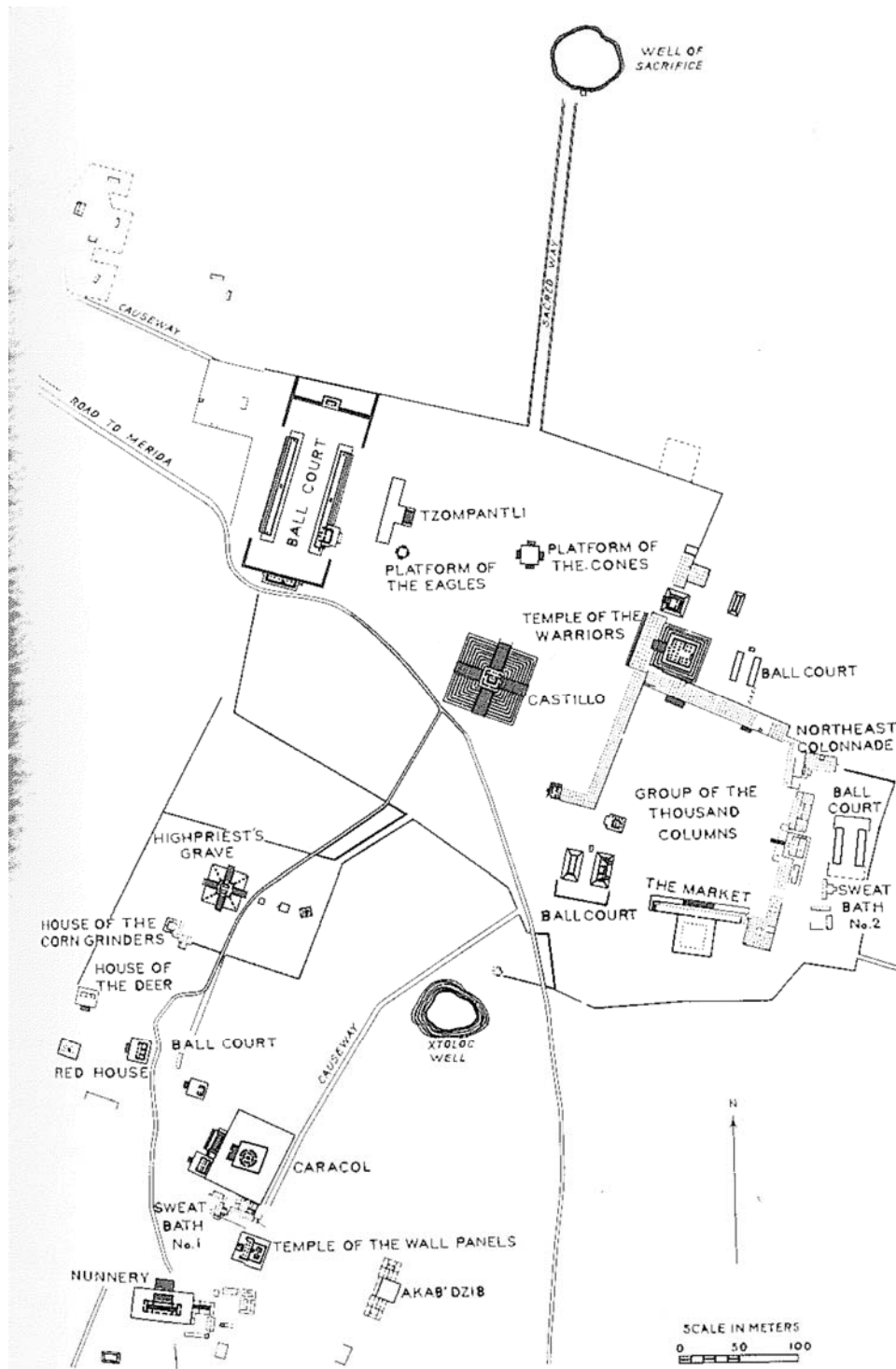


Figure 3: Map of the Epicenter of Chichen Itza (after Sharer and Traxler 2007, Fig. 9.29, Stanford University Press)

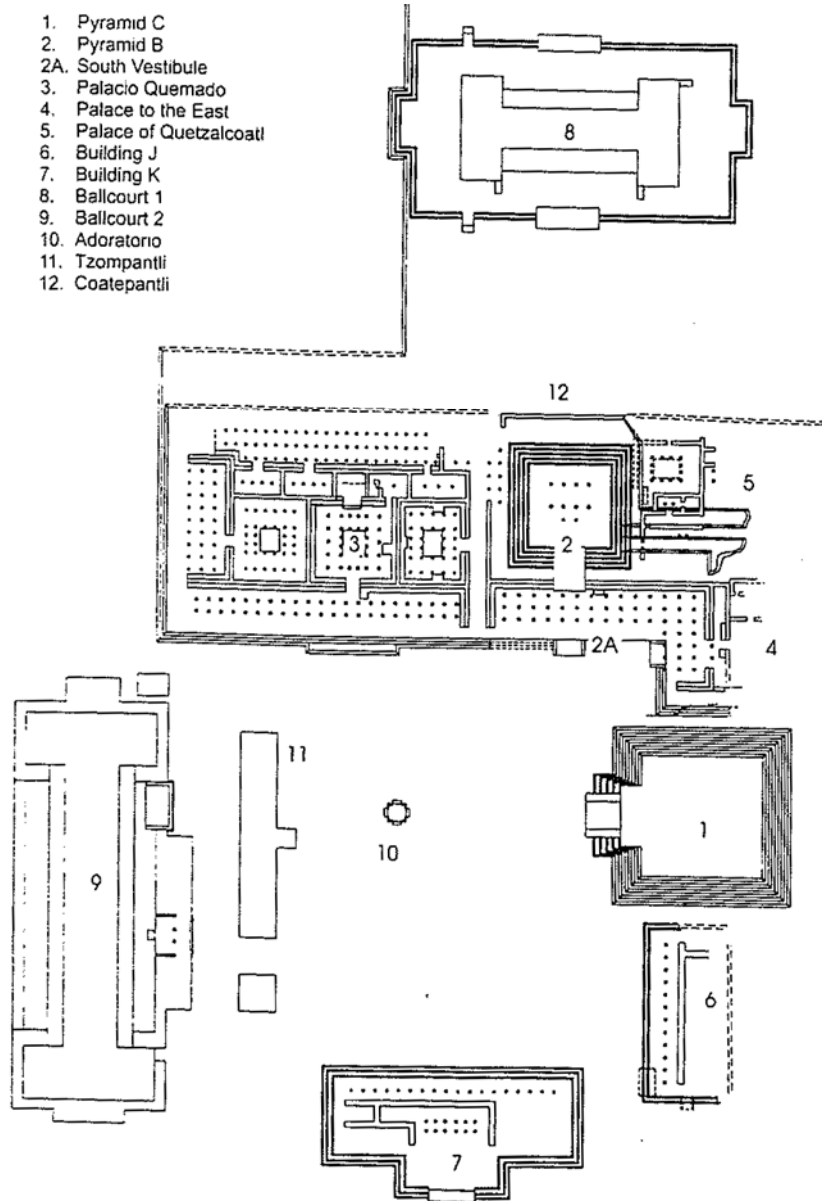


Figure 4: Map of Tula Grande (after Mastache et al 2002, Fig. 5.8, Colorado University Press)

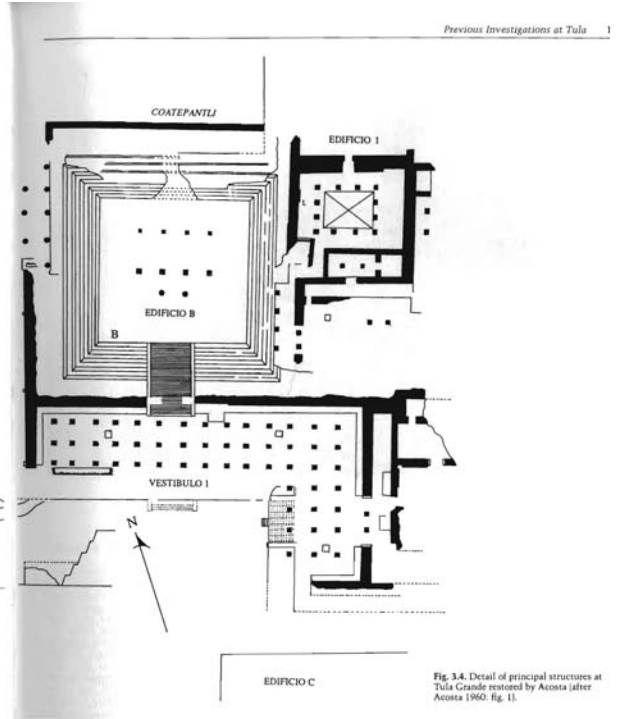
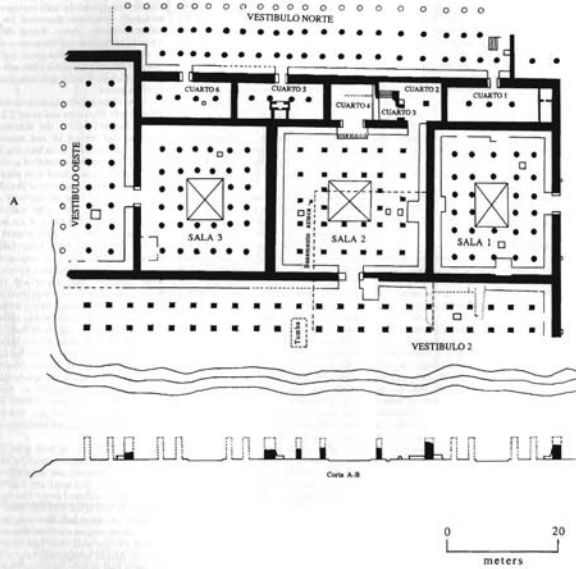


Fig. 3.4. Detail of principal structures at Tula Grande restored by Acosta (after Acosta 1960: Fig. 1).

Figure 5: Details of the Edificio 3 (Salas 1, 2, and 3), Pyramid (Edificio) B, and Vestibulos at Tula Grande (Diehl, 1989, Fig. 3.4, University of Iowa Press, after Acosta 1960, Fig. 1, INAH)

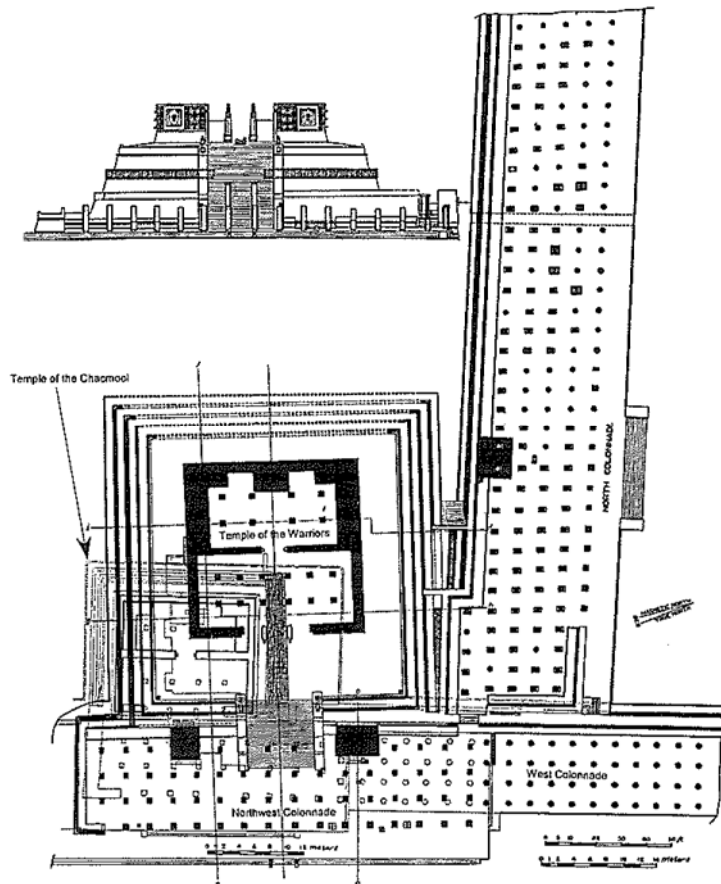


Figure 6: Plan of the Temple of the Warriors and Colonnades at Chichen Itza (Morris 1931, Pls. 3 and 3a, Carnegie Institution of Washington, D.C.)

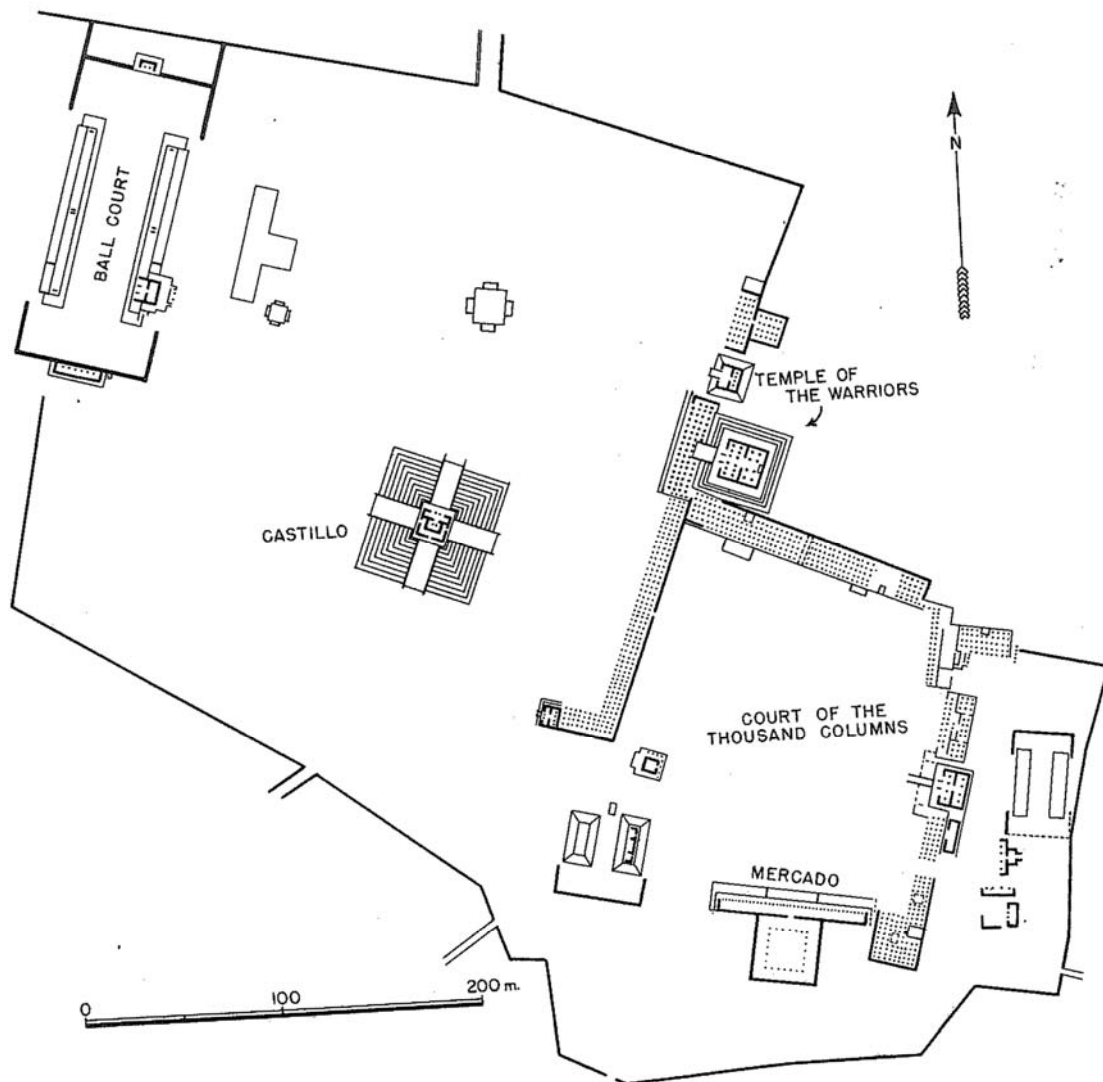


Figure 7: Map of the Gran Nivelación at Chichen Itza (after Ruppert 1943, Fig. 1, Carnegie Institution of Washington, D.C.)

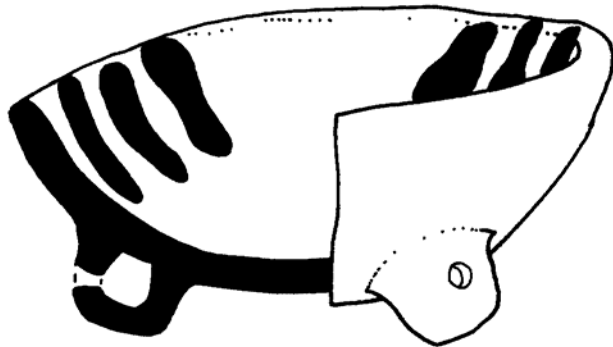
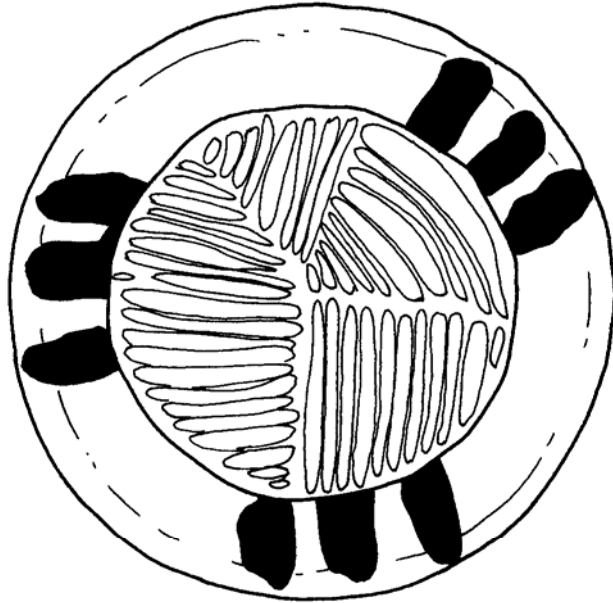


Figure 8: Grater Bowl, Chichen Slate (drawn by L. Martindale Johnson, after Brainerd 1958:Figure74h)

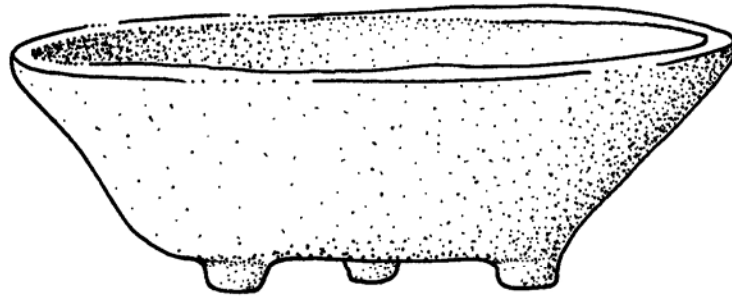


Figure 9: Tollan Phase, Jara Polished Orange Tripod Dish (drawn by L. Martindale Johnson, after Acosta 1954:Figure 4.1)

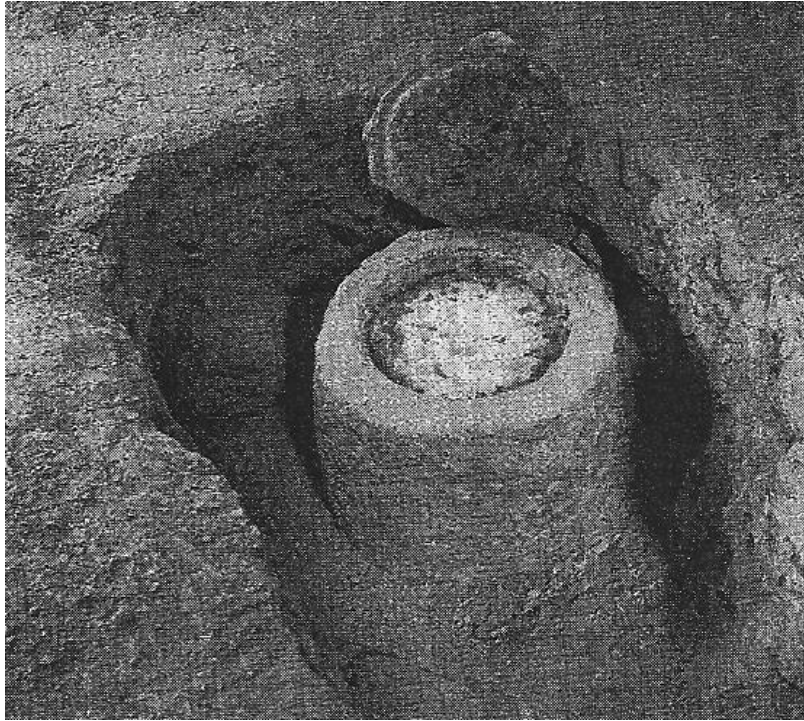


Figure 10: Chichen Itza, cache inside limestone jar, Temple of the Chacmool (Morris et al 1931:Figure 119)

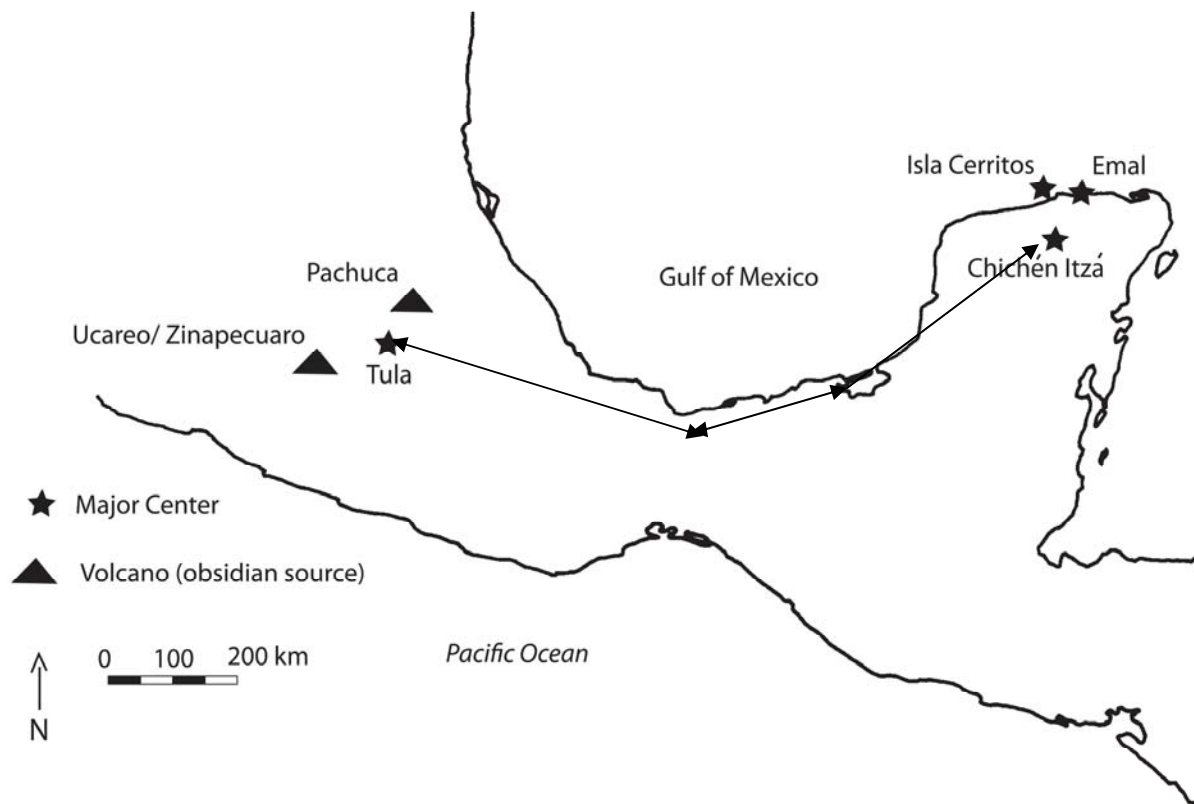


Figure 11: Map Showing Possible Migration Routes (drawn by L. Martindale Johnson and A. Slusser, after Kepecs 2007:Figure 1)

APPENDIX B: COPYRIGHT PERMISSIONS

Dear Ms. Slusser,

I am happy to give you permission to use the material you request. Good luck with the thesis and please send me a copy of when you are finished.

Sincerely,

Richard A. Diehl

From: Andrea - USA [mailto:aslusserlaw@gmail.com]

Sent: Wednesday, September 03, 2008 9:50 AM

To: Diehl, Richard

Subject: copyright permission

Andrea B. Slusser
21 Woodward Avenue
Asheville, NC 28804

September 2, 2008

Dr. Richard A. Diehl
University of Alabama
24E Ten Hoor Hall
rdiehl@tenhoor.as.ua.edu

Dear Dr. Diehl:

I am completing a master's degree at the University of Central Florida entitled "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá". I would like your permission to reprint in my thesis excerpts from the following:

Diehl, Richard A.

1989 Previous Investigations at Tula, in Tula of the Toltecs, Excavations and Survey, University of Iowa Press, Iowa City, Iowa

The excerpt to be reproduced is:

Figure 3.4, Detail of principal structures at Tula Grande restored by Acosta (after Acosta fig. 1, 1960)

I will reference the Acosta 1960 article as well as your figure. The requested permission extends to any future revisions and editions of my thesis, including non-exclusive world rights in all languages, and to the publication of my thesis on demand by UMI. These rights will in no way restrict reproduction of the material in any other form by you or others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign and date the letter where indicated below and return it to me. Thank you for your attention to this matter.

Sincerely,

Andrea B. Slusser

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE

By: _____

Date: _____

Richard A. Diehl

Andrea B. Slusser
21 Woodward Avenue
Asheville, NC 28804

June 20, 2008

Ms. Tina McDowell, Editor
Publications Office
Carnegie Institution
1530 P Street, NW
Washington, D.C. 20005

Dear Ms. McDowell:

I am completing a master's degree at the University of Central Florida entitled "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá". I would like your permission to reprint in my thesis excerpts from the following:


Ruppert, Karl
1943 *The Mercado Chichén Itzá Yucatán*, Contributions to American Anthropology and History, No. 43, Pub. No. 546, Carnegie Institution of Washington, D.C.

The excerpt to be reproduced is:
Fig. 1, Mercado, Plan and Elevation

The requested permission extends to any future revisions and editions of my thesis, including non-exclusive world rights in all languages, and to the publication of my thesis on demand by UMI. These rights will in no way restrict reproduction of the material in any other form by you or others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign and date the letter where indicated below and return it to me in the enclosed envelope. Thank you for your attention to this matter.

Sincerely,


Andrea B. Slusser

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE

By: _____
Tina McDowell

Date: _____

6-15-08
Carnegie has no
objection to your
use of the
stated
material
1/1/02 Sme1600
2009091120

Andrea B. Slusser
21 Woodward Avenue
Asheville, NC 28804

June 20, 2008

Ms. Tina McDowell, Editor
Publications Office
Carnegie Institution
1530 P Street, NW
Washington, D.C. 20005

Dear Ms. McDowell:

I am completing a master's degree at the University of Central Florida entitled "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá". I would like your permission to reprint in my thesis excerpts from the following:

Morris, Earl H., Jean Charlot and Ann Axtell Morris
1931 *The Temple of the Warriors at Chichén Itzá Yucatán*, Carnegie Institution of Washington Pub. No. 546, Washington, D.C.

The excerpt to be reproduced is:
Pls. 3 and 3A, Plan of West, Northwest, and North Colonnades and the Temples of the Warriors and Chacmool at Chichén Itzá

The requested permission extends to any future revisions and editions of my thesis, including non-exclusive world rights in all languages, and to the publication of my thesis on demand by UMI. These rights will in no way restrict reproduction of the material in any other form by you or others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign and date the letter where indicated below and return it to me in the enclosed envelope. Thank you for your attention to this matter.

Sincerely,

Andrea B. Slusser

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE

By: _____
Tina McDowell

Date: _____

8-15-08
Carnegie has no objection to your use of the stated material.
11/28/08 S. Mep. used
2009/5/11/20

Andrea B. Slusser
21 Woodward Avenue
Asheville, NC 28804

June 20, 2008

Mr. Darrin Pratt, Director
Rights and Permissions Department
University Press of Colorado
5589 Arapahoe Avenue, Ste. 206C
Boulder, CO 80303

Dear Mr. Pratt:

I am completing a master's degree at the University of Central Florida entitled "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá". I would like your permission to reprint in my dissertation excerpts from the following:

Mastache, Alba Guadalupe, Robert H. Cobean, and Dan M. Healan
2002 *Ancient Tollan: Tula and the Toltec Heartland*. University Press of Colorado, Boulder, CO

The excerpt to be reproduced is:
Fig. 5.8, **Plan of Tula Grande Plaza**,

The requested permission extends to any future revisions and editions of my dissertation, including non-exclusive world rights in all languages, and to the publication of my dissertation on demand by UMI. These rights will in no way restrict reproduction of the material in any other form by you or others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign and date the letter where indicated below and return it to me in the enclosed envelope. Thank you for your attention to this matter.

Sincerely,

Andrea B. Slusser

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE

By: 
Darren Pratt, Director

Date: 6/26/08

STANFORD UNIVERSITY PRESS

File Perm: ROBERT J. SHARER WITH LOA
1450 Page Mill Road
Palo Alto, CA 94304-1124
Fax: 650 725 3457

WWW.SUP.ORG

other

Andrea Slusser

Invoice no.

21 Woodward Avenue

Your ref. Master's thesis, University

Asheville North 28804

United States

Request date 6/20/2008

License date 7/30/2008

Permission is granted to the above to use the following selection:

Ch. 9, p. 561, Fig. 9.29 "Chichen Itza, Yucatan, Mexico: map of the central area of the greatest Terminal Classic Maya city"

from The Ancient Maya, Sixth Edition

by Robert J. Sharer with Loa P. Traxler

In the following publication:

Title: "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá"

Author/Editor: Slusser, Andrea B.

Publisher: University of Central Florida/UMI

Print run:

Price:

Audience: Scholarly

hardcover

hard price

Publication date 12/31/2008

paperback

paper price

Permission is subject to the following terms:

1. Permission covers the non-exclusive World rights, in the English language, for the specific edition described above, including special editions for use by individuals with disabilities, only if this edition is neither sold nor rented for a fee.
2. Payment of a fee of \$ 0 payable on or before publication. Tax ID 94-1156365-N
3. The user may make no changes in the written material without the consent of the publisher.
4. Permission covers material owned by Stanford University Press only; the Licensee is responsible for securing permission for material owned by another party included in the selection.
5. This permission is void if more than 10% of the licensee's publication is composed of material from Stanford University Press.

6. The following credit should appear on the credit page or on the copyright page:

Map from Robert J. Sharer with Loa P. Traxler
The Ancient Maya, Sixth Edition

Copyright (c) 2005 by the Board of Trustees of the Leland Stanford Jr. University

All rights reserved. Used with the permission of Stanford University Press, www.sup.org.

STANFORD UNIVERSITY PRESS

File Perm: Robert J. Sharer with Loa

1450 Page Mill Road
Palo Alto, CA 94304-1124
Fax: 650 725 3457

other

WWW.SUP.ORG

7. Permission is contingent upon 1) signing and returning one copy of this license within 2 months and 2) paying the fee in full before or upon publication.

8. **1 copy of the forthcoming work** shall be forwarded to the Permissions Department, Stanford University Press, upon publication.

9. Permission is for one time use. Request additional permission for any other use of the material, including but not limited to subsequent editions, translations, ancillaries, electronic or digital editions.

10. The licensed material shall not be sold, assigned, or re-licensed.

11. The term of this license is 5 years from the date of the license.


12. The Licensor makes no representations or warranties with respect of the licensed material.

13. The Licensee hereby indemnify and agree to hold harmless the Licensor and their respective officers, directors, employees and agents, from and against any and all claims arising out of the licensee's use of the licensed material other than as specifically authorized pursuant to this license.

Agreed: _____

Title: _____

Date: _____



Ariane de Pree
Rights and Contracts Manager
Stanford University Press

SAVE TIME! REQUEST PERMISSION ON-LINE AT WWW.SUP.ORG

Andrea B. Slusser
21 Woodward Avenue
Asheville, NC 28804

October 22, 2008

Ms. Tina McDowell, Editor
Publications Office
Carnegie Institution
1530 P Street, NW
Washington, D.C. 20005

Dear Ms. McDowell:

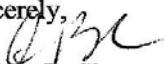
I am completing a master's degree at the University of Central Florida entitled "Discerning Migration in the Archaeological Record: a Case Study at Chichén Itzá". I would like your permission to reprint in my thesis excerpts from the following:

Morris, Earl H., Jean Charlot and Ann Axtell Morris
1931 *The Temple of the Warriors at Chichén Itzá Yucatán*, Carnegie Institution of Washington Pub. No. 546, Washington, D.C.

The excerpts to be reproduced are:
Figure 117, Obverse and Reverse, Sandstone from Altar Cache, North Colonnade and
Figure 119, Limestone Jar Containing Altar Cache in situ, Temple of the Chac Mool

The requested permission extends to any future revisions and editions of my thesis, including non-exclusive world rights in all languages, and to the publication of my thesis on demand by UMI. These rights will in no way restrict reproduction of the material in any other form by you or others authorized by you. Your signing of this letter will also confirm that you own the copyright to the above-described material.

If these arrangements meet with your approval, please sign and date the letter where indicated below and return it to me in the enclosed envelope. Thank you for your attention to this matter.

Sincerely,

Andrea B. Slusser

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE

By: _____
Tina McDowell

Date: _____

REFERENCES CITED

- Acosta, Jorge R.
1942-1944 La Tercera Temporada de Exploraciones Arqueológicas en Tula, Hidalgo, 1942. *Revista Mexicana de Estudios Antropológicos* 6:125-164.
- 1945 Las Cuarta y Quinta Temporadas de Exploraciones Arqueológicas en Tula, Hidalgo, 1943-1944. *Revista Mexicana de Estudios Antropológicos* 7:23-64.
- 1954 Resumen de los Informes de las Exploraciones Arqueológicas en Tula, Hidalgo, durante las VI, VII, y VIII Temporadas, 1946-1950. *Anales de INAH* 8:37-115.
- 1957 Resumen de los Informes de las Exploraciones Arqueológicas en Tula, Hidalgo, durante las IX y X Temporadas, 1953-1954. *Anales de INAH* 9:119-169
- 1960 Las Exploraciones en Tula, Hidalgo durante la XI Temporada, 1955. *Anales de INAH* 11:39-72.
- 1961 La Doceava Temporada de Exploraciones en Tula, Hidalgo. *Anales de INAH* 13:29-58.
- 1964 La Decimotercera Temporada de Exploraciones en Tula, Hidalgo. *Anales de INAH* 16:45-76.
- 1974 La Pirámide de El Corral de Tula, Hidalgo. In 1974 *Proyecto Tula, Primera parte*, edited by Eduardo Matos Moctezuma, pp. 27-50. Colección Científica, Arqueología, no. 15, INAH, Mexico City.
- Adams, William Y., Dennis P. Van Gerven and Richard S. Levy
1978 The Retreat from Migrationism. *Annual Review of Anthropology* 7:483-532.
- Ammerman, Albert J. and L. L. Cavelli-Sforza
1984 *The Neolithic Transition and the Genetics of Population in Europe*. Princeton University Press, Princeton, New Jersey.
- Anderson, Patricia K.
1998 Yula, Yucatán, Mexico: Terminal Classic Maya Ceramic Chronology for the Chichén Itzá Area. *Ancient Mesoamerica* 9:151-165.
- Andrews, Anthony P.
1978 Puertos Costeros del Postclásico Temprano en el Norte de Yucatán. *Estudios de Cultura Maya* 11:75-93.

- 1990 The Fall of Chichén Itzá: a Preliminary Hypothesis. *Latin American Antiquity* 1(3):258-267.
- Andrews, Anthony P., Frank Asaro, Helen V. Mitchell, Fred Stross, and Pura Cervera Rivera
1989 The Obsidian Trade as Isla Cerritos, Yucatán, Mexico. *Journal of Field Archaeology* 16(3):355-376.
- Andrews, Anthony P. and Fernando Robles Castellanos
1985 Chichén Itzá and Cobá: An Itzá-Maya Standoff in Early Postclassic Yucatán. In *The Lowland Maya Postclassic*, edited by Arlen F. Chase and Prudence M. Rice, pp. 62-72. University of Texas Press, Austin, Texas.
- Andrews, E. Wyllys V. and Jeremy A. Sabloff
1986 Classic to Postclassic: A Summary Discussion. In *The Lowland Maya Postclassic*, edited by Arlen F. Chase and Prudence M. Rice, pp. 433-456. University of Texas Press, Austin, Texas.
- Anthony, David W.
1990 Migration in Archeology: the Baby and the Bathwater. *American Anthropologist* 92:895-914.
- Ball, Joseph W.
1974 A Coordinate Approach to Northern Maya Prehistory: A.D. 700-1000. *American Antiquity* 39(1):85-93.
- Bey, George J. III and William M. Ringle
2007 From the Bottom Up: The Timing and Nature of the Tula-Chichén Itzá Exchange. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 377-427. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Beyer, Herman
1937 *Studies on the Inscriptions of Chichén Itzá*. Contributions to American Archaeology, 21. Carnegie Institution of Washington Pub. 483. Carnegies Institution of Washington, Washington, D.C.
- Bolles, John S.
1977 *Las Monjas: a Major Pre-Mexican Architectural Complex at Chichén Itzá*. University of Oklahoma Press, Norman, Oklahoma.
- Brainerd, George
1958 The Archaeological Ceramics of Yucatan. *Anthropological Records* 19. University of California Press, Berkeley and Los Angeles.

- Braswell, Geoffrey E.
2003 Obsidian Exchange Spheres. In *The Postclassic Mesoamerican World*, edited by Michael E. Smith and Frances F. Berdan, pp. 131-158. The University of Utah Press, Salt Lake City, Utah.
- Braswell, Geoffrey E. and Michael D. Glascock
2003 The Emergence of Market Economies in the Ancient Maya World: Obsidian Exchange in Terminal Classic Yucatán, Mexico. In *Geochemical Evidence for Long Distance Exchange*, edited by Michael D. Glascock, pp. 33-52. Bergin and Garvey, Westport, Connecticut.
- Brown, Clifford T. and Walter R. T. Witschey
2008 *The Electronic Atlas of Ancient Maya Sites*. Electronic document, <http://www.mayagis.smv.org>, accessed November 7, 2008.
- Burmeister, Stefan
2000 Archaeology and Migration: Approaches to an Archaeological Proof of Migration. *Current Anthropology* 41(4):539-567.
- Canul, Gabriel Euan
2003 Apéndice No. 1, Costumbres Funerarias en Chichén Itzá: el Grupo de la Serie Inicial. In *Informe del Proyecto Arqueológico Chichén Itzá de Julio de 1999 a Diciembre de 2002*, edited by Peter J. Schmidt, pp. 47-54. Centro INAH Yucatán: Mérida, Yucatán.
- Chase, Arlen F.
1986 Time Depth or Vacuum: The 11.3.0.0.0 Correlation and the Lowland Maya Postclassic. In *Late Lowland Maya Civilization: Classic to Postclassic*, edited by Jeremy A. Sabloff and E. Wyllys Andrews V, pp. 99-140. University of New Mexico Press: Albuquerque, New Mexico.
- 1990 Maya Archaeology and Population Estimates in the Tayasal-Paxcaman Zone, Peten, Guatemala. In *Prehistoric Population History in the Maya Lowlands*, edited by T. P. Culbert and D.S. Rice, pp. 149-165. University of New Mexico Press, Albuquerque, New Mexico.
- Chase, Arlen F. and Diane Z.
1998 Late Classic Maya Political Structure, Polity Size, and Warfare Arenas. In *Anatomía de una Civilización: Aproximaciones Interdisciplinarias de la Cultura Maya*, edited by N. Ciudad Ruiz et al, pp. 11-29. Sociedad Española de Estudios Mayas, Madrid.
- Chase, Diane Z. and Arlen Chase F.
1982 Yucatecan Influence in Terminal Classic Northern Belize. *American Antiquity* 47(3):596-614.

- 1998 The Architectural Context of Caches, Burials, and Other Ritual Activities for the Classic Period Maya (as Reflected at Caracol, Belize). In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 299-332. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Cobean, Robert H.
1990 *La Cerámica de Tula, Hidalgo*. Estudios sobre Tula 2, INAH, Mexico, D.F.
- Cobean, Robert H. and Alba Guadalupe Mastache
1989 The Late Classic and Early Postclassic Chronology of the Tula Region. In *Tula of the Toltecs: Excavations and Survey*, edited by Dan M. Healan, pp. 34-46. University of Iowa Press, Iowa City
- Cobos (Palma), Rafael
2004 Chichén Itzá: Settlement and Hegemony during the Terminal Classic Period. In *The Terminal Classic in the Maya Lowlands: Collapse, Transition, and Transformation*, edited by Arthur A. Demarest, Prudence M. Rice, and Don S. Rice, pp. 517-544. University Press of Colorado, Boulder, Colorado.
- 2006 The Relationship between Tula and Chichén Itzá: Influences or Interaction? In *Lifeways in the Northern Lowlands*, edited by Jennifer Mathews and Bethany A. Morrison, pp. 173-183. University of Arizona Press, Tucson, Arizona.
- 2007 Multepal or Centralized Kingship? New Evidence on Governmental Organization at Chichén Itzá. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 315-343. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Coggins, Clemency Chase (editor)
1992 *Artifacts from the Cenote of Sacrifice, Chichén Itzá, Yucatán*. Memoirs of the Peabody Museum of Archaeology and Ethnology 10(3), Harvard University, Cambridge, Massachusetts.
- Cordell, Linda S.
1995 Tracing Migration Pathways from the Receiving End. *Journal of Anthropological Archaeology* 14:203-211.
- Davies, Nigel
1977 *The Toltecs until the Fall of Tula*. University of Oklahoma Press, Norman, Oklahoma.
- De la Garza, Mercedes

- 1985 Prológo. In *Libro de Chilam Balam de Chumayel*. Translated by Antonio Mediz Bolio. CONACULTA, Mexico City.
- Diaz-Bolio
1952 *La Serpiente Emplumada*. Registro de Cultura Yucateca, Mérida, Yucatán, Mexico.
- Diehl, Richard A.
1989 Previous Investigations at Tula. In *Tula of the Toltecs: Excavations and Survey*, edited by Dan M. Healan, pp. 13-29. University of Iowa Press, Iowa City.

1993 The Toltec Horizon in Mesoamerica: New Perspectives on an Old Issue. In *Latin American Horizons*, edited by Don S. Rice, pp. 263-294. Dumbarton Oaks Research Library and Collection, Washington, D.C.
- Gates, William
1978 (1937) Introduction. In *Yucatán Before and After the Conquest*. Translated by William Gates. Publication No. 20, The Maya Society, Baltimore, Maryland. 1978 ed. Dover Publications, New York.
- Gillespie, Susan
2007 Toltecs, Tula, and Chichén Itzá: The Development of an Archaeological Myth. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 85-127. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Gonzales de la Mata, Maria Rocio
2003 Anexo No. 4 – Informe sobres los Chultunes de Chichén Itzá, Avances del Programa para la Localización de las Fuentes de Agua para la Antigua Ciudad. In *Informe del Proyecto Arqueológico Chichén Itzá de Julio de 1999 a Diciembre de 2002*, edited by Peter J. Schmidt, pp. 67-94. Centro INAH Yucatán: Mérida, Yucatán.
- Gonzales de la Mata, Maria Rocio and Anthony P. Andrews
1998 Navigation and Trade on the Eastern Coast of the Yucatán Peninsula. In *Maya*, edited by Peter Schmidt, Mercedes de la Garza, and Enrique Nalda, pp. 451-467. Rizzoli International Publications, New York.
- Grube, Nikolai
1994 Hieroglyphic Sources for the History of Northwest Yucatan. In *Hidden among the Hills, Maya Archaeology of the Northwest Yucatan Peninsula: First Maler Symposium, Bonn, 1989*, edited by Hanns J. Prem, pp. 316-358. Verlag von Flemming: Auflage, Mochmuhl, Germany.
- Grube, Nikolai and Ruth J. Krochock

- 2007 Reading Between the Lines: Hieroglyphic Texts from Chichén Itzá and Its Neighbors. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 205-249. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Haury, Emil W. (Chairman), Robert L. Rands, Albert C. Spaulding, Walter L. Taylor, Raymond H. Thompson (Editor), Robert Wauchope and Marian E. White (Recorder)
1956 An Archaeological Approach to the Study of Cultural Stability. In *Seminars in Archaeology: 1955*. Memoirs of the Society for American Antiquity Number 11. American Antiquity XXII (2) Part 2:32-57.
- Healan, Dan M. (editor)
1989 *Tula of the Toltecs: Excavations and Survey*. University of Iowa Press: Iowa City.
- Healan, Dan M.
2007 New Perspectives on Tula's Obsidian Industry and its Relationship to Chichén Itzá. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 429-447. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Healan, Dan M., Robert H. Cobean, and Richard A. Diehl
1989 Synthesis and Conclusions. In *Tula of the Toltecs: Excavations and Survey*, edited by Dan M. Healan, pp. 239-251. University of Iowa Press, Iowa City.
- Healan, Dan M. and James W. Stoutamire
1989 Surface Survey of the Tula Urban Zone. In *Tula of the Toltecs: Excavations and Survey*, edited by Dan M. Healan, pp. 203-236. University of Iowa Press, Iowa City.
- Hooten, Earnest A.
1940 Skeletons from the Cenote of Sacrifice at Chichen Itza. In *the Maya and Their Neighbors*, edited by Clarence L. Hay, pp. 272-280. D. Appleton-Century Company, New York.
- Kelley, David H.
1976 *Deciphering the Maya Script*. University of Texas Press, Austin.
1968 Kakupacal and the Itzás. *Estudios de Cultura Maya* 7:255-268.
- Kepecs, Susan
1998 Diachronic Ceramic Evidence and its Social Implications in the Chikinchel Region, Northeast Yucatan, Mexico. *Ancient Mesoamerica* 9:121-135.

2003 Chikinchel. In *The Postclassic Mesoamerican World*, edited by Michael E. Smith and Frances F. Berdan, pp. 259-268. The University of Utah Press, Salt Lake City, Utah.

2005 Mayas, Spaniards, and Salt: World Systems Shifts in Sixteenth-Century Yucatán. In *The Postclassic to Spanish Transition in Mesoamerica: Archaeological Perspectives*, edited by Susan Kepecs and Rani Alexander, pp. 117-137. University of New Mexico Press, Albuquerque, New Mexico.

2007 Chichén Itzá, Tula, and the Epiclassic/Early Postclassic Mesoamerican World System. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 129-149. Dumbarton Oaks Research Library & Collection, Washington, D.C.

Kepecs, Susan and Philip Kohl

2003 Conceptualizing Macroregional Interaction: World Systems Theory and the Archaeological Record. In *The Postclassic Mesoamerican World*, edited by Michael E. Smith and Frances F. Berdan, pp. 14-20. The University of Utah Press, Salt Lake City.

Kepecs, Susan, Gary Feinman, and Sylviane Boucher

1994 Chichén Itzá and its Hinterland: a World-systems Perspective. *Ancient Mesoamerica* 5:141-158.

Kowalski, Jeff Karl

2007 What's "Toltec" at Uxmal and Chichén Itzá? Merging Maya and Mesoamerican Worldviews and World Systems in Terminal Classic to Early Postclassic Yucatán. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 251-313. Dumbarton Oaks Research Library & Collection, Washington, D.C.

Kremer, Jürgen

1994 The Putun Hypothesis Revisited. In *Hidden among the Hills, Maya Archaeology of the Northwest Yucatan Peninsula: First Maler Symposium, Bonn, 1989*, edited by Hanns J. Prem, pp. 289-307. Verlag von Flemming: Auflage, Mochmuhl, Germany.

Kristan-Graham, Cynthia

2007 Structuring Identity at Tula: The Design and Symbolism of Colonnaded Halls and Sunken Spaces. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 531-577. Dumbarton Oaks Research Library & Collection, Washington, D.C.

Kristan-Graham, Cynthia and Jeff Karl Kowalski

2007 Chichén Itzá, Tula, and Tollan: Changing Perspectives on a Recurring Problem in Mesoamerican Archaeology and Art History. In *Twin Tollans: Chichén Itzá, Tula, and*

the Epiclassic to Early Postclassic Mesoamerican World, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 13-83. Dumbarton Oaks Research Library & Collection, Washington, D.C.

Krochock, Ruth

1989 Hieroglyphic Inscriptions at Chichén Itzá, Yucatán, México: the Temples of the Initial Series, the One Lintel, the Three Lintels, and the Four Lintels. In *Research Reports on Ancient Maya Writing*, pp. 7-14. Center for Maya Research, Washington, D.C.

Krochock, Ruth and David A. Freidel

1994 Ballcourts and the Evolution of Political Rhetoric at Chichén Itzá In *Hidden among the Hills, Maya Archaeology of the Northwest Yucatan Peninsula: First Maler Symposium, Bonn, 1989*, edited by Hanns J. Prem, pp. 359-375. Verlag von Flemming: Auflage, Mochmuhl, Germany.

Kubler, George

1986 (1984) *The Art and Architecture of Ancient America: the Mexican, Maya and Andean Peoples*, 3rd Edition. Penguin Books: Harmondsworth, Middlesex, England.

Lincoln, Charles E.

1986 The Chronology of Chichén Itzá: a Review of the Literature. In *Late Lowland Maya Civilization: Classic to Postclassic*, edited by Jeremy A. Sabloff and E. Wyllys Andrews V, pp. 141-196. University of New Mexico Press: Albuquerque, New Mexico.

1990 *Informe: Primera Temporada del Proyecto Arqueológico Chichén Itzá. Resultados del trabajo de campo y laboratorio: 1983 a 1985 con un ensayo exploratorio sobre el Ptaron de Asentimiento del Sitio*. INAH, Mérida, Yucatán, Mexico

Lopez de la Rosa, Edmundo

2006 Kakupacal: una Revisión de su Lectura en Textos Prehispánicos. In *Los Maya Ayer y Hoy, Tomo II* edited by Alfredo Barrera Rubio and Ruth Gubler, pp. 600-735. Conaculta-INAH, Mérida, Yucatán, Mexico.

Lothrop, Samuel K.

1952 *Metals from the Cenote of Sacrifice, Chichén Itzá, Yucatán*. Memoirs of the Peabody Museum of Archaeology and Ethnology 10(2), Harvard University Press, Cambridge, Massachusetts.

Love, Bruce

1989 The Hieroglyphic Lintels of Yulá, Yucatán, México. In *Research Reports on Ancient Maya Writing*, pp. 15-22. Center for Maya Research, Washington, D.C.

Maldonado Cárdenas, Rubén

- 1997 Las Intervenciones de Restauración Arqueológico en Chichén Itzá (1926-1980). In *Homenaje al Profesor César A. Sáenz*, edited by Angel García Cook, Alba Guadalupe Mastache, Leonor Merino, and Sonia Rivero Torres, pp. 103-131. Instituto Nacional de Antropología e Historia, México, D.F.
- Maldonado Cárdenas, Rubén and Edward J. Kurjack
2003 Reflexiones sobre las Relaciones entre Chichén Itzá, sus Vecinos Peninsulares, y Tula. *Arqueología* 9-10:97-103.
- Mandeville, Margaret D. and Dan M. Healan
1989 Architectural Remains in the El Corral Locality. In *Tula of the Toltecs: Excavations and Survey*, edited by Dan M. Healan, pp. 171-199. University of Iowa Press, Iowa City.
- Marquina, Ignacio
1964 *Arquitectura Prehispánica*. INAH, Mexico, D.F.
- Mastache, Alba Guadalupe, Robert H. Cobean, and Dan M. Healan
2002 *Ancient Tollan: Tula and the Toltec Heartland*. University Press of Colorado, Boulder, Colorado.
- Matos Moctezuma, Eduardo (editor)
1974 *Proyecto Tula, Primera parte*. Colección Científica, Arqueología, no. 15, INAH, Mexico City.

1976 *Proyecto Tula, Segunda parte*. Colección Científica, Arqueología, no. 33, INAH, Mexico City.
- Matos Moctezuma, Eduardo
1978 The Tula Chronology: A revision. In *Middle Classic Mesoamerica: A.D. 400-700*, edited by Esther Pasztory, pp. 172-177. Columbia University Press, New York.
- McVicker, Donald
1985 The “Mayanized” Mexicans. *American Antiquity* 50(1):82-101.
- Miller, Arthur D.
1977 Captains of the Itzá: Unpublished Mural Evidence from Chichén Itzá. In *Social Progress in Maya Prehistory: Studies in Honor of Sir Eric Thompson*, pp. 197-225. Academic Press, London and New York.

1978 A Brief Outline of the Artistic Evidence for Classic Period Culture Contact between Maya Lowlands and Central Mexican Highlands. In *Middle Classic Mesoamerica, A.D. 400-700*, edited by Esther Pasztory, pp. 63-70. Columbia University Press, New York.

Miller, Mary Ellen

1985 A Re-Examination of the Mesoamerican Chacmool. *The Art Bulletin* 67(1):7-17.

Molina Montes, Augusto

1982 Archaeological Buildings: Restoration or Misrepresentation. In *Falsifications and Misreconstructions of Pre-Columbian Art; a conference at Dumbarton Oaks, October 14th and 15th, 1978*, edited by Elizabeth H. Boone, pp. 125-141. Dumbarton Oaks Research Library and Collection, Washington, D.C.

Morris, Earl Halstead, Jean Charlot, and Ann Axtell Morris

1931 *The Temple of the Warriors at Chichen Itzá, Yucatan*, 2 volumes, Publication No. 406. The Carnegie Institution of Washington, Washington, D.C.

Piña Chan, Román

2003 *Chichén Itzá: La Ciudad de los Brujos del Agua*. Fondo de Cultura Económica: Mexico City, Mexico.

Pollock, H.E.D.

1936 The Casa Redonda at Chichen Itzá, Yucatan. In *Contributions to American Archaeology No. 17*, pp. 131-162. The Carnegie Institution of Washington, Washington, D.C.

Proskouriakoff, Tatiana

1974 *Jades from the Cenote of Sacrifice, Chichén Itzá, Yucatán*. Memoirs of the Peabody Museum of Archaeology and Ethnology 10(1), Harvard University Press, Cambridge, Massachusetts.

Renfrew, Colin

1987 *Archaeology and Language: the Puzzle of Indo-European Origins*. Cambridge University Press, New York.

Ringle, William M.

1990 Who was who in Ninth-Century Chichén Itzá. *Ancient Mesoamerica* 1:233-243.

2004 On the Political Organization of Chichén Itzá. *Ancient Mesoamerica* 15:167-218.

Ringle, William M., Tomas Gallareta Negron, and George J. Bey, III

1998 The Return of Quetzalcoatl: Evidence for the Spread of a World Religion during the Epiclassic Period. *Ancient Mesoamerica* 9:183-232.

Robertson, Merle Greene

1994 The Iconography of “Isolated Art Styles”, that are “Group Supported” and “Individual Supported” Occuring at Chichen Itza and Uxmal. In *Hidden among the Hills, Maya Archaeology of the Northwest Yucatan Peninsula: First Maler Symposium, Bonn*,

1989, edited by Hanns J. Prem, pp. 197-211. Verlag von Flemming: Auflage, Mochmuhl, Germany.

Robles Castellanos, Francisco

1987 La Secuencia Cerámica Preliminar de Isla Cerritos, Costa Centro-Norte de Yucatán. In *Maya Ceramics: Papers from the 1985 Maya Ceramic Conference, Part 1*, edited by Prudence M. Rice and Robert J. Sharer, pp. 99-109. BAR International Series 345(i). British Archaeological Reports, Oxford.

Rouse, Irving

1958 The Inferences of Migration from Anthropological Evidence. In *Migrations in New World Culture History*, edited by Raymond H. Thompson, pp. 63-68. University of Arizona Social Science Bulletin No. 27, Tucson.

1986 *Migrations in Prehistory: Inferring Population Movement from Cultural Remains*. Yale University, New Haven and London.

Roys, Ralph L.

1972 *The Indian Background of Colonial Yucatán*. Reprinted. The University of Oklahoma, Norman, Oklahoma. Originally published 1943, *The Civilization of the American Indian Series*, Volume 118, Carnegie Institution of Washington, Washington, D.C.

Roys, Ralph L. (editor)

1933 *The Book of Chilam Balam of Chumayel*. Translated by Ralph L. Roys. Publication No. 438, The Carnegie Institution of Washington, Washington, D.C.

Ruppert, Karl

1931 Temple of the Wall Panels, Chichen Itzá. In *Contributions to American Anthropology and History, Vol. 1, No. 3, Publication No. 403*, pp. 117-140. The Carnegie Institution of Washington, Washington, D.C.

1935 *The Caracol at Chichen Itza, Yucatan, Mexico*, Publication No. 454. The Carnegie Institution of Washington, Washington, D.C.

1943 The Mercado Chichén Itzá, Yucatán. In *Contributions to American Anthropology and History, Vol. 8, No. 43, Publication No. 546*, pp. 269-297. The Carnegie Institution of Washington, Washington, D.C.

1952 *Chichén Itzá Architectural Notes and Plans*. Publication No. 595, Carnegie Institution of Washington, Washington, D.C.

Schele, Linda and Peter Mathews

- 1998 *The Code of Kings: The Language of Seven Sacred Maya Temples and Tombs*. Scribner, New York.
- Schmidt, Peter J.
 1994 Chichén Itzá. *Arqueología Mexicana* (11)10:20-25.
- 1998 Contacts with Central Mexico and the Transition to the Postclassic: Chichén Itzá in Central Yucatan. In *Maya*, edited by Peter Schmidt, Mercedes de la Garza, and Enrique Nalda, pp. 426-449. Rizzoli International Publications, New York.
- 1999 Chichén Itzá: Resultados y Proyectos Nuevos (1992-1999). *Arqueología Mexicana* (8)37:32-39.
- 2003 *Informe del Proyecto Arqueológico Chichén Itzá de Julio de 1999 a Diciembre de 2002*, edited by Peter J. Schmidt, pp. 1-46. Centro INAH Yucatán: Mérida, Yucatán.
- 2007 Birds, Ceramics, and Cacao: New Excavations at Chichén Itzá, Yucatán. In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 151-203. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Sharer, Robert J. and Loa P. Traxler
 2006 *The Ancient Maya*. Stanford University Press, Stanford, California.
- Smith, Michael E. and Frances F. Berdan
 2003 Spatial Structure of the Mesoamerican World System. In *The Postclassic Mesoamerican World*, edited by Michael E. Smith and Frances F. Berdan, pp. 21-31. The University of Utah Press, Salt Lake City, Utah.
- Smith, Robert E.
 1971 *The Pottery of Mayapán, Including Studies of Ceramic Material from Uxmal, Kabah and Chichén Itzá*, vols. 1-2. Papers of the Peabody Museum of Archaeology and Ethnology 66. Harvard University Press, Cambridge, Massachusetts.
- Sodi Miranda, Frederica and Felipe R. Solis Olguín (editors)
 1987 *La Cerámica Arqueológica de la Ciudad de Quetzalcóatl: Estudios Enéditos de la Alfarería de Tula*. Universidad Autónoma del Estado de Hidalgo, Pachuca, Hidalgo, Mexico.
- Taube, Karl Andreas
 1994 The Iconography of Toltec Period Chichen Itza. In *Hidden among the Hills, Maya Archaeology of the Northwest Yucatan Peninsula: First Maler Symposium, Bonn, 1989* edited by Hanns J. Prem, pp. 212-246. Verlag von Flemming: Auflage, Mochmuhl, Germany.

- Thompson, Edward H. and J. Eric S. Thompson
1938 *The High Priest's Grave Chichen Itza, Yucatan, Mexico*. Field Museum of Natural History Anthropological Series 27 (1). Chicago.
- Thompson, J. Eric S.
1937 A New Method of Deciphering Yucatecan Dates with Special Reference to Chichen Itza. In *Contributions to American Archaeology, No. 22*. The Carnegie Institution of Washington, Washington, D.C.

1970 *Maya History and Religion*. University of Oklahoma Press, Norman, Oklahoma.
- Tozzer, Alfred M.
1957 *Chichen Itza and its Cenote of Sacrifice: a Comparative Study of Contemporaneous Maya and Toltec*. Memoirs of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. 11 and 12. Peabody Museum, Cambridge, Massachusetts.
- Tozzer, Alfred M. (editor and translator)
1941 *Landa's Relación de las Cosas de Yucatán. A Translation*. Volume 18, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge, Massachusetts.
- Trigger, Bruce G.
1968 *Beyond History: the Methods of Prehistory*. Holt, Rinehart and Winston, New York.

1984 Archaeology at the Crossroads: What's New? *Annual Review of Anthropology* 13:275-300.
- Smith, Michael E.
2007 Tula and Chichén Itzá: Are We Asking the Right Questions? In *Twin Tollans: Chichén Itzá, Tula, and the Epiclassic to Early Postclassic Mesoamerican World*, edited by Jeff Karl Kowalski and Cynthia Kristan-Graham, pp. 579-617. Dumbarton Oaks Research Library & Collection, Washington, D.C.
- Vaillant, George C.
1935 Chronology and Stratigraphy in the Maya Area. *Maya Research* 2:119-143.
- Wichmann, Soren
2006 Mayan Historical Linguistics and Epigraphy: A New Synthesis. *Annual Review of Anthropology, 2006* 35:279-294.
- Willard, T.A.

1926 *The City of the Sacred Well: Being a Narrative of the Discoveries and Excavations of Edward Herbert Thompson in the Ancient City of Chichenitza 1910*. Grossett & Dunlap, New York.

Willey, Gordon R. (Chairman), Charles C. DiPeso, William A. Ritchie, Irving Rouse, John H. Rowe and Donald W. Lathrop (Recorder and Editor)

1956 An Archaeological Classification of Culture Contact Situations. In *Seminars in Archaeology: 1955*. Memoirs of the Society for American Antiquity Number 11. American Antiquity XXII (2) Part 2:5-30.

Wren, Linnea and Peter Schmidt

1991 Elite Interaction during the Terminal Classic Period: New Evidence from Chichén Itzá. In *Classic Maya Political History: Hieroglyphic and Archaeological Evidence*, edited by T. Patrick Culbertson, pp. 199-225. School of American Research and Cambridge University Press, Cambridge, Massachusetts.