THE CLASSIC MAYA COLLAPSE:
A REVIEW OF EVIDENCE AND INTERPRETATIONS

THESIS

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Jeffrey Clark Wood, B. A.
Denton, Texas

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Classic Maya civilization which flourished A.D. 250-900 fell from causes unknown. This study traces the evidences and interpretations of those who sought to explain the downfall. Discussion begins with treatment of the ideas of pre-archaeological travellers to the region and then shifts to the twentieth century. Themes of internal collapse are explored, first focusing on such catastrophes as earthquakes and epidemics, followed by an examination of Maya agricultural technology and its possible failure. The fifth chapter, on internal violence and external influences as causes of Maya collapse, analyzes theories of peasant revolt, wars between autonomous Maya city-states, and the strong possibility of outright invasion by other aboriginal peoples.

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INTRODUCTION

Today in lower Mesoamerica live some two million Maya Indians. This generates surprise among those who believe the Maya a prehistoric people who attained a high level of civilization and then, for unexplained reasons, met with extinction. This is partly the case: the blood line survived; the civilization did not. Yet the world of the Maya has changed dramatically through the centuries. From prehistoric beginnings, as yet dimly perceived, the Maya developed a civilization *in situ*, though not in isolation, which, in the Classic period (A.D. 250-900) boasted many accomplishments: a vigesimal mathematical system, the use of an accurate calendar and hieroglyphic writing, monumental architecture, a high degree of artistic craftsmanship in various media, a diversified economic system in which trade played a major role, and a successful agricultural technology. These and other endeavors were regulated by a political power of considerable magnitude with the aid of a highly respected and probably widely feared priesthood.

This was the Classic Age of the Maya, when forgotten heroes and unremembered prophets led vanished nations to lost grandeurs. For half a milennium before their decay in the ninth century of the Common Era, Maya city-states with exceptional sophistication in the arts and sciences dominated most of the land from

the Isthmus of Tehuantepec to western Honduras. Enumeration and explanation of Classic Maya successes would require volumes, and many such exist. Far fewer are those works addressed directly to their greatest failure--the failure to continue to flourish as a civilization--which led to their subsequent reversion to a culture less organized and materially inferior to their former way of life. For unknown reasons, in the decades prior to 900 A.D. the Maya cultural centers were abandoned, never again to regain the heights of civilization reached by their ancestors.

The fall of the Maya city-states ushered in a Dark Age. The core area of the Classic Maya was largely abandoned: the great cities died. Along the margins of the old Maya World, occasional flashes of brilliance illuminated 600 years of mediocrity. The death of the great cities killed also the memory of them. Whether Maya books in 1500 held stories of glorious lost kingdoms or did not was rendered unknowable when the Spaniards burned the books. The Maya Dark Age was not enlightened in the Spanish Period by the keeping of records. The losses from depopulation and the success of hispanization in depriving the Indian of the memory of the pagan past did far more to kill Indian culture than the Christ-eyed records of the Europeans did to preserve its memory.[1]

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1. Michael D. Coe, The Maya (New York: Praeger Publishers, 1966), pp. 17-73.

The present study shall focus on the problem of the Classic Maya collapse. It does not pretend to prove any single or multiple causation for the abandonment of the organizational centers, but rather intends to examine the ideas which have been proposed to explain the mystery of their demise. Rather than a simple re-statement of past themes, there will be the presentation of evidences used in construction of representative arguments pertaining to the collapse. Discussion is admittedly brief, but hopefully will provide an insight into the historical development of ideas concerning the collapse.

The theories are as varied as the backgrounds of their proponents; some are based an inadequate information while others are the products of imagination. Of necessity, those inquirers of earlier years were handicapped by their own prejudices and an imperfect understanding of Maya society, the geographic extent of the culture, and their interactions with contemporaries. Those who earliest demonstrated their interests in the decayed monuments of a forgotten age confined themselves largely to descriptions of what remained and speculations about origins and spent little time wondering why the erstwhile inhabitants deserted what appeared to have been magnificent cities. Yet those observations were of utmost importance to later studies, as through the years, a considerable body of information about the Maya became available, and more knowledgeable theories about their collapse could be advanced.

Even today much disagreement ferments within archaeological circles regarding the very nature of Classic Maya society, and even more surrounds the still unknown reasons for its collapse. In the past few decades archaeologists have engaged in a more systematic approach to the study of the Maya area, and a great corpus of material has accumulated. The results of these investigations have led to healthy debate as well as some inevitable personal antagonisms. Yet the basic problem remains: insufficient evidence can yield only inconclusive explanations of the demise of the Classic Maya.

The problem of the collapse is marked by a number of characteristics unearthed by archaeologists, which are summarized below by Richard E. W. Adams:

1. The failure of the elite-class structure
   a. The abandonment of administrative and residential structures (palaces)
   b. Cessation of erection and refurbishment of funerary monuments and foci of ritual activities (temples)
   c. Cessation of sculptured historical monuments and records (stelae)
   d. Cessation of the manufacture of luxury items such as the finest polychrome pottery, fine stonework, and jade carving for the use of an elite class
   e. Cessation of the use of calendrical and writing systems, at least in Classic period forms
   f. Cessation of nearly all behavioral patterns associated with the above and other elite-class-directed activity, for example, the ball game played in formal courts. The processionals, rituals, visits, and conferences characteristic of Maya elite-class life lapsed
   g. From the above, it follows that the Classic Period elite class ceased to exist
2. The apparent rapid depopulation of the countryside and the ceremonial centers

3. The relatively short period of occurrence-from 50 to 100 years[2]

These observations stem from the vantage point of the twentieth century after the accumulation of data through several hundred years. With the acute vision produced by hindsight, it is far too easy to be overly critical of the methodologies (or lack thereof) employed by early professional and amateur investigators. True, the transgressions of amateurs and early professionals were legion, but so were their contributions. As in any endeavor, improvement is the child of trial and error.

Such was and remains the case with the collapse of the Classic Maya. Ideas once in vogue became discredited with the advance of knowledge, while others were modified. Where once more emphasis was placed on a single cause, it became more acceptable (and realistic) to ascribe the collapse to a number of inter-related factors; where the collapse often was viewed as a self-contained event within the confines of the Maya area, now increasing emphasis is placed on the inter-play of contemporaneous cultures; and where it was once believed that a single cause or set of causes could explain the failure of the civilization, the recognition that "Maya culture of the Classic Period was heavily regionalized" led to the belief that

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2. Richard E. W. Adams, "The Collapse of Maya Civilization: A Review of Previous Theories," in The Classic Maya Collapse, ed. T. Patrick Culbert (Albuquerque: University of New Mexico Press, 1973) p. 22.

"causes and specific circumstances of its collapse were at least regionalized, and perhaps even localized."[3]

Nonetheless, for years many investigations were predicated upon a belief in non-interference from non-Maya peoples. The more traditional view found its most widely known and respected champion in Sylvanus G. Morley, who reviewed internal causation themes, such as natural catastrophes of a degree sufficient to topple a civilization, and problems of subsistence--a complex matter including the maintenance of an ecological equilibrium sufficient to provide the people with proper nutrition. Finally, Morley explored the theme of internal causation based on evidence of internal strife, whether of peasants in open revolt or an inter-city war.[4]

Recent investigations have led archaeologists to consider external causes of collapse more seriously. External themes revolve about two major issues: the role of long distance trade with contemporaneous peoples and the possibility of economic chaos resulting from its breakdown, and the question of military intervention or even conquest. Today the trend is to emphasize a more open ended approach to the study of the collapse, and there are few who doubt that a combination of various internal and external problems which may never be understood completely, destroyed a flourishing Maya civilization.[5]

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3. Ibid, p. 21

4. Sylvanus Griswold Morley, The Ancient Maya, 3rd ed. rev. by George Brainerd (Stanford: Stanford University Press, 1956), pp. 68-73.

5. Adams, "The Collapse," in Classic Collapse, ed. Culbert, p. 23.

Since there was a basic bi-partite division of themes, internal and external, for so many years, this basic division will best serve in analyzing the historical development of the ideas on the collapse. However, before plunging into modern researches, it is necessary to begin with the pre-archaeological years: the discovery of the Maya by Spanish explorers, the subsequent paucity of interest under their rule, and the later re-awakening of curiosity by a sturdy breed of travellers. These were the men who laid the foundations of Maya research, and therefore merit inclusion in a study of this nature. Following the initial period of trial and error, analysis shall focus on the major internal-external theories which have been proposed through the years to provide an explanation for the Classic Maya collapse.

CHAPTER I

PRE-ARCHAEOLOGICAL THEORIES OF MAYA COLLAPSE

Numerous chronicles, letters, and relaciones recount the early voyages of exploration which resulted in the discovery of the peninsula of Yucatán.[1] The early years of the sixteenth century found the intrepid Spaniards seeking new lands and, not incidentally, great riches. Many dreamed of imminent fulfillment of their hopes when, in March of 1517, an expedition under the command of Juan de Grijalva landed at Cape Catoche on the northeastern tip of the Yucatán Peninsula. From the sea they sighted a town, so large it could be seen from a distance of two leagues, and so impressive with its temples and houses of stone the explorers dubbed it "the Great Cairo."[2] What better sign of wealth could possibly be hoped for by these men, most of whom had seen little but rude huts and naked savages on the islands of Cuba and Hispaniola?

The expected wealth did not materialize; instead, many of the Spaniards found death in the land inhabited by the Maya.

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1. Robert S. Chamberlain, The Conquest and Colonization of Yucatan 1517-1550, Carnegie Institution of Washington Publication, no. 582 (Washington, D.C.: Carnegie Institution, 1948), pp. 11-16.

2. Bernal Diaz del Castillo, The Discovery and Conquest of Mexico, 1517-1521, trans., Alfred P. Maudslay (New York: The Noonday Press, 1956), p. 19.

For years those same aboriginal Americans who so inhospitably received the Spaniards were given slight notice, as no silver or gold was found there, while it seemed plentiful to the north and south among the Nahua and Inca. Yet after the early treasure fever ended, Pedro de Alvarado conquered the Maya of the Guatemala region, while Francisco de Montejo, granted a royal patent for pacification of Yucatán, eventually accomplished the same ends there.[3] With the area more or less secure the task of Christianization began in earnest, and the priesthood set to its mission with great vigor.

The early priests enjoyed more intimate contacts with the Maya than did the conquistador and later, the encomendero. Fortunately, some of them recorded observations of the customs of the times. Fray Diego de Landa, a Franciscan, arrived in Yucatán in 1549. In his Relación de las Cosas de Yucatán he described what he remembered of the variety of ancient objects and hieroglyphic codices he had so faithfully destroyed in an infamous auto de fé designed to exorcise the memory of the devil from the newly "Christianized" peninsula. He also recorded oral historical traditions of the Yucatecans in an attempt to reconstruct the Maya past, and so performed a valuable service in partial recompense for the destruction he wrought. Though much maligned, it is thanks to this

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3. Chamberlain, Conquest of Yucatan, pp. 186-253.

"Defender of the Faith" that we possess any substantial information about the sixteenth century Maya.[4] As concerned as the Spaniards of the colonial era may have been about their discoveries in the New World, their curiosity seldom extended to the Indian except insofar as the indígenes were a coveted economic resource. They certainly devoted little effort to preserving the Maya past. But priests played a vital role in the dissemination of information to those who later opened the frontiers of the Maya to world interest.

Throughout the colonial era an almost total silence enshrouded Maya history. The few works written about them were seldom circulated. It was not until the closing years of the eighteenth century that the clouds obscuring a vision of the Maya past began to lift. Hidden beneath the vegetation in Chiapas lay the remains of a city known to few. Fray Ramón Ordoñez y Aguiar, a priest of nearby Ciudad Real, had for years heard stories of a hidden city, and sent investigators to verify the reports. His informants stirred his imagination and he notified José Estachería, President of the Royal Audiencia of Guatemala, who, after two disappointing expeditions, then dispatched one Antonio del Río, a captain of artillery, to visit the ruins of Palenque, where he arrived in May of 1787.

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4. Alfred M. Tozzer, ed., Landa's Relación de las Cosas de Yucatán, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 18 (Cambridge, Mass: Peabody Museum, 1941), pp. vii-x.

A man of military training, del Río set to his task with vigor and discipline. In spite of the difficulties of travel and work during the rainy season, he cleared the tangled mass of vegetation from the crumbling ruins, defacing many of them in the process, and faithfully described what he found. Yet, more curious about the origins of the civilization than its demise, he made its beginnings the object of his speculations. Though the outside world had begun to hear whispers of buried cities, the official report of del Río to Estachería remained in obscurity until its tardy publication in 1822.[5]

Without knowledge of the previous visit to Palenque by del Río, Guillermo Dupaix, a retired officer of Dragoons commissioned by Charles IV of Spain, left Mexico City and undertook a series of expeditions to the ancient ruins of Spanish America. Following his researches in New Spain, his third expedition took him to Palenque in May of 1808. Dupaix, unlike del Río, who merely carried out his orders, had gained a reputation as a student of antiquities, and demonstrated a great respect for aboriginal accomplishments throughout his explorations. Using available knowledge he concluded that the ruins of Palenque already had been abandoned at the time of the Spanish conquest; otherwise mention of the city would have been made by the Spaniards. He then hesitatingly speculated that according to the Nahuatl tradition, "Montezuma

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5. Antonio del Río, Description of the Ruins of an Ancient City (London: Henry Berthoud, 1822), pp. 1-128.

extended his conquest far away, to the kingdom of Utlatlán, Guatemala."[6] He was the first explorer in the nineteenth century to propose a theory of collapse, however brief, based upon an as yet misunderstood chronological tradition.

Almost twenty-five years passed before, in 1831, the Irish immigrant and political opportunist Juan Galindo examined the site of Palenque while serving as Governor of the Department of Petén, Guatemala. It is highly unlikely he ever viewed the report of del Río or Dupaix before his expeditions. The mayor at the nearby town of Palenque offered his knowledge regarding the ruins, insisting "that a colony of Spaniards had erected them before the Conquest!"[7] Despite such hearsay, Galindo relied upon his own judgment to interpret the physical evidence.

Judiciously disregarding local information, he made a serious examination of the ruins of Palenque, leaving with a basic knowledge of the site which was to help him compare it with others in the area--most notably Copán, which he examined in 1834 at the behest of the government of Guatemala. He originated the theory, based on the similarity of their hieroglyphics, that the two sites were of the same culture. Yet

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6. Guillermo Dupaix, "Viages de Guillelmo Dupaix sobre las Antiguedades Mejicanas," in Edward King, Antiquities of Mexico, 7 vols. (London: Robert Havel; and Colnaghi, Son, and Company, 1831-1848), 5:318.

7. Robert L. Brunhouse, In Search of the Maya (Albuquerque: University of New Mexico Press, 1973), p. 36.

Galindo's speculations regarding the collapse of the sites were in vain. He fell victim to an abundance of further misinformation. He mistook the ancient site of Copán for the more recent town of the same name which had been conquered by the Spaniard Hernando de Chávez in 1530. He could not understand, like so many others before and after him, why "Palenque was abandoned, and the Memory of its Existence appears to have been obliterated before the Conquest; whereas the Spaniards found Copan inhabited and in the Summit of its Perfection."[8]

After del Río, Dupaix, and Galindo came adventurers of an extraordinary nature. Although governments commissioned other expeditions, and for some, a serious spirit of international competition prompted action, most explorations were largely unpublicized and contributed little of substance to aid in unravelling the mystery. And, unlike the earlier forays which were essentially under hispanic auspices, few subsequent explorations were undertaken by inhabitants of the region. Instead, travellers came from Europe and the United States.

Jean Frederic Waldeck, a French artist, first learned of American antiquities in 1822 when asked to illustrate del Río's description of Palenque. By the time he journeyed to America he had already formed opinions about Central American

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8. Transactions of the American Antiquarian Society II, p. 549, n.d., f.n. 2, from Ephraim G. Squier, ed., Collection of Rare and Original Documents and Relations, no. 1 (New York: Charles B. Norton, 1860), p. 8.

cultures, especially about their great antiquity, which he then sought to prove, rather than to pursue his studies objectively. Waldeck arrived in Palenque, a Mecca of American antiquarians, in 1832, where he remained from May until July of the following year. In 1834 he spent some time at Uxmal in the peninsula of Yucatán. His most definitive statement on the fate of the Maya asserted that the kingdom "fell before the assault of a neighboring power about 600 A.D."[9] Waldeck's frequent imaginative statements prompted much criticism; his more imaginative drawings, however, served to stimulate European interest in the Maya area.

Shortly after Waldeck's travels in Central America, John Lloyd Stephens, the most famous of all the adventurers, arrived; he was accompanied by his artist friend, Frederick Catherwood of London. Stephens had been appointed by President Martin Van Buren to seek out the legitimate government of Central America, a monumental task, since the weak confederation was in constant turmoil upon his arrival in 1839. Once in the region, Stephens, who had previously made his mark in the literary world by publishing his accounts of travel in the ancient cities of the Old World, could not resist the call of the past. He well remembered reading of the ruins described by del Río, and was to explore many hitherto unknown ruins in Central America and Yucatán in addition to those described by others.[10]

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9. Brunhouse, Search of Maya, p. 72.

10. Ibid, 83-85.

Of all the nineteenth century travellers to the Maya region, Stephens was the most eloquent, the most descriptive, and, unfortunately, for this study, the least speculative. Called by some the Father of Maya Archaeology, he cannot be overlooked for his contributions. In the face of revolutionary armies, hostile Indians, torrential rains, sickness, and debilitating injury, his were the most extraordinary recorded journeys undertaken in Central America. From Copán to Quriguá, from Palenque to various Yucatecan sites--there were no answers to the questions he posed regarding the previous inhabitants. Describing this circumstance at Copán he wrote:

> The city was desolate. No remnant of this race hangs around the ruins, with traditions handed down from father to son and from generation to generation. It lay before us like a shattered bark in the midst of the ocean, her masts gone, her name effaced, her crew perished, and none to tell whence she came, to whom she belonged, how long on her voyage, or what caused her destruction-her lost people to be traced only by some fancied resemblance in the construction of the vessel, and, perhaps, never to be known at all. All was mystery, dark, impenetrable mystery, and every circumstance increased it.[11]

Mysterious though the circumstances might be, it was only fitting, given Stephens' penchant for accuracy, that he refrain from speculation regarding the Maya collapse. At Palenque, he had already decided that any theory "would be uncertain and unsatisfactory."[12] All he could do was wonder at "the remains of a cultivated, polished, and peculiar people, who

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11. John Lloyd Stephens, Incidents of Travel in Central America, Chiapas and Yucatan, 2 vols. (New Brunswick: Rutgers University Press, 1949), 1:81.

12. Ibid, 1:124.

had passed through all stages incident to the rise and fall of nations, had reached their golden age, and had perished, entirely unknown."[13]

B. M. Norman, setting out for Yucatán in November of 1841, would wonder, much like Stephens, at the remains of the ancient civilization. He had the benefit of examining previous works, including those of Waldeck, Stephens, and the compilation of Edward King, Lord Kingsborough, before writing his Rambles in Yucatan. Like previous visitors to the ancient ruins, he was confronted with the ignorance of the indigenous population: "Of the builders or occupants of these edifices which were in ruins about them, they had not the slightest idea; nor did the question seem to have ever occurred to them before."[14]

Norman's theory of the Maya downfall may have been based largely on the work of Kingsborough. He mentioned traditions of southern migrations by the Aztecs, and stated that the "central seat of power in the peninsula was gradually forced to yield to the assaults of more warlike nations, who invaded it from the North."[15] He then postulated an increasing decadence under the conquerors until all central authority disintegrated prior to the Spanish discovery of America.

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13. Ibid, 2:302-303

14. B. M. Norman, Rambles in Yucatan (New York: J. and H. G. Langley, 1843), p. 110.

15. Ibid, 249.

Three subsequent travellers to Central America and Yucatán viewed the very arrival of the Spaniards in the New World as the cause of the collapse of the Maya. The Frenchman Desiré Charnay, whose second visit to Mexico began in 1880, and the Englishmen Channing Arnold and Frederic Frost, whose account was published in 1909 shortly after their return from México, all blamed the conquistadores for the Maya demise. These three went to greater lengths though with no more evidence, to assert their theories than had former travellers.

Desiré Charnay stood in marked contrast to John L. Stephens. He lacked Stephens' appreciation of the ruins, and though he found them curious, in his deprecating manner he ruled the monuments "the unpretending outcome of a semi-civilised people."[16] Never did it occur to Charnay that he could possibly err in his judgment. By the time of Charnay, the Toltecs, grown large in the eyes of explorers and scholars because of numerous mythological references to that people, had been credited with the vast majority of all Indian culture. He grasped at any reference by the sixteenth century Spaniards which pointed to an Indian civilization still intact, and saw little reason to suspect that the ruined cities of Chiapas and Yucatán were more than several hundred years old. Charnay denied the antiquity of Palenque, asserting that it "was probably peopled by a floating population dispersed at

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16. Desiré Charnay, The Ancient Cities of the New World (New York: Harper and Brothers, 1887), p. 306.

the first alarm of the Conquest."[17] He felt that if "numerous towns were found deserted, it does not prove their antiquity, but rather, the deep universal hatred of the natives for the conquerors."[18]

According to Charnay, the Maya were still at the pinnacle of their glory when the Spaniards arrived, and would rather have deserted their cities than serve as Spanish vassals. His final assertion regarding their civilization states: "It is idle to speculate how it would have developed had it not been stopped in its inspiration and destroyed by the arrival of the Spaniards."[19]

The work of Arnold and Frost concurred with that of Charnay concerning the collapse of Maya civilization. They were at variance with him, however, regarding the builders of the cities, maintaining they were the work of Buddhist immigrants rather than Toltecs.[20] Arnold and Frost had read the work of Charnay and others, and even though few could maintain strongly that the Maya-Buddhist civilization was intact in the sixteenth century, they contended

> when the white man first set foot in Yucatan the civilization of her people was an actual living civilization, though the key to the origins of it has yet to be discovered. The half-century which elapsed between the first discovery of the Peninsula and the establishment of Spanish authority sufficed to render desolate the mighty cities which covered its surface,

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17. Ibid, 246. 18. Ibid, 464. 19. Ibid, 478.

20. Channing Arnold and Frederick J. T. Frost, The American Egypt: A Record of Travel in Yucatan (London: Hutchinson and Company, 1909), p. viii.

> to scatter and decimate its vast populations, to extirpate and suppress the native religion, and to ring down the curtain upon the Mayan past.[21]

Charnay, Arnold, and Frost at least attempted an authoritative explanation of the second aspect of the Maya enigma, tinged though it was with the scent of the anti-Spanish "black legend." Most writers spent their time in wild speculation of the origins of the civilization; these three brought the question of its demise to the fore and answered it in no uncertain terms. However, their theory gained few adherents, based as it was on rather hurried glimpses of various monuments and the work of previous travellers.

By the middle of the nineteenth century others began studies of a more serious nature beginning with Charles Etienne Brasseur de Bourbourg. This well educated, overly immaginative, multi-lingual French abbé manifested an interest in American antiquities through his study of the compilation of Lord Kingsborough in 1846. Two years later he journeyed to Mexico and immersed himself in a study of the classical Nahuatl language, spoken by the ancient inhabitants of Central Mexico.[22]

In 1854 the abbé was in Central America, now studying the Cakchiquel and Quiché languages of the Guatemalan highlands. While in Guatemala, Brasseur rediscovered the Popol Vuh, the

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21. Ibid, 226.

22. Carroll Edward Mace, "Charles Etienne Brasseur de Bourbourg, 1814-1874," in Guide to Ethnohistorical Sources, Handbook of Middle American Indians, vol. 13, pt. 2, ed. Howard F. Cline (London: University of Texas Press, 1973), p. 300.

written tradition of the Quiché Maya, and gained access to the Annals of the Cakchiquels, both of which he translated from the native tongues. By comparing the traditions of the highland Maya with those of the Central Mexicans, the linguistic pioneer attempted a compilation of the ancient history of the aboriginal inhabitants. His discovery in Madrid of Fray Diego de Landa's Relación de las cosas de Yucatán, in 1863, a work lost for over 300 years, undeniably contributed to virtually every succeeding work treating the Maya.[23]

The works of Brasseur were signally important in establishing a reasonable chronology of epochs of Maya history, but were weakened in their effect by the inclusion of references to Atlantis as the original homeland of the Maya. His discussion of the Maya collapse shall be reserved for later treatment, but it must be noted that he was a pioneer in the search and use of post-Conquest native manuscripts to unravel their ancient histories.

While belief in the existence and influence of Atlantis marred the work of Brasseur in the eyes of many, such a belief was among the milder speculations advanced by Augustus LePlongeon. This self-professed authority ranks as the most curious figure in the study of Maya civilization. Born in Britain to French parents, he spent his early life as a traveller to the Pacific Ocean and South America. When he first came to Yucatán in 1873 to study and explore the ruins, he became carried away with his every speculation.[24]

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23. Brunhouse, Search of Maya, 112-124. 24. Ibid., 136-45.

Based on his excavations at Chichén Itzá and Uxmal, the bearded eccentric made a number of assertions untenable to the growing number of serious scholars. These theories were often advanced in an extremely egotistical and authoritative fashion. Among the truths he claimed to discover were "the existence of giants and pygmies", an ancient Maya telegraph system, and the key to the ancient Maya hieratic alphabet, discovered by me" which are "as near alike to the ancient hieratic alphabet of the Egyptians as two alphabets can possibly be."[25]

Perhaps the crowning glory of LePlongeon's rampant imagination lay in his assertion that the Maya possessed the first civilization and spread it around the globe, bearing culture to India and Egypt over 11,500 years ago.[26] Such wild utterances through the years resulted in a widespread lack of acceptance which he bitterly resented and apparently could not understand. If a question arose, the pompous LePlongeon could answer it, yet seldom could he prove his assertions. On the question of the Maya collapse, he, like others adhered to the invasion theory:

> A people, starting from the vicinity of Plaleque, invaded all the regions west and south of what, in our days, is called the Yucatan Peninsula. From

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25. Augustus LePlongeon, "Archaeological Communication on Yucatan", in Phillip J. J. Valentini, The Mexican Calendar Stone (Worcester: Charles Hamilton, 1879), p. 63; Stephen Salisbury, Jr. "Dr. LePlongeon in Yucatan," Proceedings of the American Antiquarian Society, no. 69 (1877), p. 118; Augustus LePlongeon, Sacred Mysteries among the Mayas and the Quiches (New York: Robert Macoy, 1885), p. 113.

26. LePlongeon, Sacred Mysteries, p. 22.

> that place, following the coast, they ravaged the eastern part of the country, and at or about the beginning of the Christian era laid siege to the cities of the holy and wise men, the seat of a very advanced civilization, where arts, sciences and religion flourished. There, in the impulse of their ignorance, in the heat of their wrath they destroyed many objects of art.[27]

He later added that the invaders, the Nahuatl, "came spreading ruin and desolation. They destroyed the principal cities; the images of the heroes, of the great men, of the celebrated women, that adorned the public squares and edifices."[28]

Augustus LePlongeon, as a serious scholar, deserves no mention; as a strong-willed man with a cause, he ranks highly. Unfortunately, his wild theories and personal literary vendettas may have discredited the attempts of his contemporaries to formulate serious theories in regard to the Maya.

The historians of the nineteenth century were confronted with various theories and frequently, with inconsistent information accumulated from the time Antonio del Río's work was first published. To sort through the maze of information posed a major problem. Few historians actually visited the region inhabited by the ancient Maya, as travel was especially arduous and fraught with danger. The land itself presented a great many obstacles. Mountainous in places, flat in others, almost all was and remains covered by dense vegetation. Transportation

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27. Salisbury, "LePlongeon," Proceedings, pp. 96-97.

28. Augustus LePlongeon, Queen Moo and the Egyptian Sphinx, 2nd ed. (New York: Press of J. J. Little and Company, by the author, 1896), p. xxx.

through such regions depended on mules, boats, or dugouts, and agonizing miles on foot. Oftentimes these problems were the easiest to overcome. The Indians inhabiting this territory, descendants of the Classic Maya and migrant Nahuatl, were especially hostile toward foreigners. Governments were in a continual state of upheaval. A Central American revolution was in progress during John L. Stephens' travels through the area; frequent Indian uprisings made later journeying in the Yucatán lowlands hazardous.

Ignorance concerning the identity of the civilization's architects, the time of its existence, and the extent of its boundaries compounded the difficulties experienced by not only the early travellers, but also the library-bound scholars. Thus the Frenchman M. de Larenaudiere, like the later Augustus LePlongeon, saw no cultural relationship between such Maya sites as Palenque and Uxmal.[29] Others earlier hypothesized such a relationship, but had no means of proving it.[30] Perhaps the thorniest problem was to establish a chronology. Many had no idea of the various epochs belonging to Maya and other Indian civilazations. This ignorance led to a wide diversity of opinion concerning their antiquity, which had a direct bearing on the theories they proposed.

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29. M. de Larenaudiere, Historia de Méjico (Barcelona: Imprenta del Imparcial, 1844), p. 38; Augustus LePlongeon, "Archaeological Communication," in Valentini, Calendar Stone, p. 64.

30. Tozzer, Landa's Relación, pp. 29-30.

Finally there was the difficulty of wading through newly discovered post Conquest native traditions. Such works as the Popol Vuh and other annals were interpreted variously, forming the basis for much and diverse speculation. Little else existed upon which to rely. Such were among the problems confronting the early Mayanists.[31]

The overall confusion nurtured by dependence on secondary sources fostered a wide variety of opinion evident in general historical treatments concerning the nature and the collapse of the vanished civilization. Yet among the endless number of general histories to be found, three theories of collapse were cited most often: invasion, the natural decadence of a high civilization, and civil war, based on the assumption of a single powerful Maya state. Many chose varying combinations of those theories.

The majority of general histories advocated the theory of invasion, by other Indian tribes,a predictable stance given the available resource material. These historians usually linked the invasions to one or more of the Nahuatl migrations believed to have taken place according to the native traditions of Guatemala and Central Mexico. John Baldwin's studies of native traditions furnished an insight into a reasonable chronology of Central America. Many historians could not distinguish between various native groups, and were thereby hampered in their efforts to discern the conquerors from the vanquished.

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31. Howard F. Cline, "Hubert Howe Bancroft, 1832-1918," Guide to Sources, Middle American Indians, vol. 13, pt. 2, ed. Cline, p. 342.

By contrasting the native languages in the Maya region Baldwin noted a considerable variance, and "in many cases, the people represented by each family of dialects were in a state of separation or disruption. . . . The most reasonable explanation of this condition of the people is that furnished by the old chronicles and traditions. The country must have been occupied, during successive periods, by different peoples."[32]

The question arose concerning the identity of the invaders. Rafael Cinta of Guatemala believed the onslaught first came from the South, as a result of eleventh century wars extending from Peru as far north as Nicaragua. These foreign tribes then drove out the inhabitants of the advanced Maya centers of Copán, Quiriguá, and Palenque. The southern invaders appropriated the abandoned cities, but they were later invaded from the North by the Nahuatl.[33]

The overwhelming majority of historians believed the invasion came from the North, most dating the event well after the close of the Classic period as defined today. The tradition of Nahuatl and Toltec migrations to the South in the twelfth century was the chief authority upon which to rely. Yet other evidence supported different causes.

Numerous travellers to Central America and Yucatán had marvelled at the size of Maya temples. B. M. Norman expressed

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32. John D. Baldwin, Ancient America (New York: Harper and Brothers, 1875), pp. 205-206.

33. Rafael Aguirre Cinta, Lecciones de História General de Guatemala (Guatemala: La Tipografía Nacional, 1899), p. 7.

his doubts that any nation of free men would choose willingly to erect such monuments.[34] Some later historians agreed with him and cited slavery as a cause of internal decay which eroded the foundations of a strong civilization.[35] Various examples of degeneration were advanced and many historians agreed that the civilization was "marked towards its close by the signs of social decadence."[36]

A belief in the social decay of the Maya civilization often led to the conclusion that such decay was a prelude to a period of war between the loosely knit population centers. The introduction of the cult of human sacrifice, attributed to the Mexicans, was paramount among evidences of decadence.[37] There followed increasing discontent among the people: "The corruption of customs and internal wars debilitated the empire to the point of its complete decadence and ruin."[38] A bishop of Yucatán, Crescencio Carillo y Ancona felt strongly that the disgraceful practices of the Maya were countered by the

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34. Norman, Rambles, p. 176.

35. J. W. Foster, Pre-historic Races of the United States of America, 2nd ed., (Chicago: S. C. Griggs and Company, 1873), p. 343.

36. Alexander W. Bradford, American Antiquities (New York: Dayton and Saxon, 1841), p. 431.

37. Cinta, Lecciones, p. 6; Crescencio Carillo y Ancona, Los Mayas de Yucatan (Mérida: Editorial Yucatense "Club del Libro" vol. 21, 1950), p. 56.

38. J. Dolores Gámez, História de Nicaragua (Managua [?]: the Government Printing Office [?], 1889 [?]), p. 24.

wrath of God, who allowed their country to be wracked by internal wars against a despotic monarchy centered in Yucatán.[39]

Whether wars were caused by decadence or by the punishment of an angry omnipotent being mattered little to others who supported the theory of internal strife as the death knell of the Classic Maya. A sizeable group of historians linked an internal revolt against the central authority to Nahuatl immigrants. Foremost among this group is Hubert H. Bancroft. The sponsor of numerous works which bear his name, Bancroft's Native Races attempted a feat in 1882 that few would consider seriously at present: to fuse together available knowledge of native traditions and travellers' reports to synthesize the "known" history of the Maya. The author, Henry L. Oak, rejected the idea of northern based migrations to the South, and though he stopped short of claiming Central America as the cradle of Indian civilizations, he did imply an in situ generation of high culture.[40] Though he despaired of reconciling the various native traditions ("Their exact meaning is beyond the reach of the most careful study"), the author postulated that the reigning power at Nachán (Palenque), the original seat of power for the empire, was of a despotic nature, and gleaning from the Popol Vuh, ventured that peaceful Nahuatl immigrants, long native to the general area, joined with an

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39. Carillo y Ancona, Mayas, p. 57.

40. Hubert Howe Bancroft, The Native Races, 5 vols. (San Francisco: A. L. Bancroft and Company, 1882), 5:185.

oppressed population in revolt. The collapse of the Maya, he thought, resulted from "the overthrow of a dynasty; the transfer of supreme power to nations that formerly occupied subordinate positions."[41]

Regardless of which opinion seemed to carry the most weight in the nineteenth century, none could be verified positively. Among contemporaneous historians, most adhered to some combination of the factors of invasion, decadence, and internal war as primary causes contributing to the Maya collapse. However, there remained those like Emory A. Allen who clung to the belief that the Spanish conquest caused the Maya demise.[42] Another, the Marquis de Nadaillac, maintained that the root of their decline was due to their being a race of worn-out people who could no longer muster the energies of "more vigorous races."[43]

To single out one individual from the many travellers and "pre-archaeologists" who impelled the development of Maya studies and grant him a place above the others would be a difficult task. It has been noted previously that John Lloyd Stephens stood above most Mayanists of his time; quite probably a man of such discriminating judgment and literary eloquence would excell among any subsequent generation of cultural inquirers. Though many who followed possessed his enthusiasm for investigation, their field methodologies, interpretations, and presentations

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41. Ibid, 5:230 and 182

42. Emory A. Allen, The Prehistoric World (Cincinnati: Central Publishing House, 1885), p. 666.

43. Marquis de Nadaillac, Pre-Historic America (New York: G. P. Putnam's Sons, 1893), pp. 265-266.

varied widely in quality. This should surprise few, as American archaeology, stumbling in its infancy, had few models upon which to draw; indeed, many looked to the growing field of Egyptology for models, and were to find that many problems of American archaeology were unique to this hemisphere and could not be jammed into a framework that worked well in Africa or Europe.[44]

As a result, Americanists were forced to rely upon common sense, and followed a seemingly never ending trail of trial and error. In retrospect it is easy to criticize. Richard MacNeish, probably over-reacting to criticisms of the archaeological discipline, scathingly and indignantly denounced turn-of-the-century investigators like William H. Holmes and Ales Hrdlicka who, like "archaeological wolves . . . slaughtered like sheep" both sites and contexts, as if he expected them to exercise the same methodologies which had been learned painfully through the course of decades.[45] But these men were pioneers, and their contributions were legion.

Toward the end of the nineteenth century, the first of the full-time Mayanists began their labors. Among them was the enthusiastic Edward H. Thompson of Worcester, Massachusetts. As a college student in 1879, he strayed from his engineering studies to write a popular article on the subject of Atlantis,

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44. Gordon R. Willey and Jeremy A. Sabloff, A History of American Archaeology (San Francisco: W. H. Freeman and Company, 1974), p. 87.

45. Richard S. MacNeish, Early Man in America, Readings from Scientific American (San Francisco: W. H. Freeman and Company, 1973), p. iii.

which attracted the notice of another Worcester resident, Stephen Salisbury. Salisbury, from his executive position in the American Antiquarian Society, had once supported the oft-deluded Augustus LePlongeon. With the power that accompanies a private fortune, Salisbury's influence extended to those in government, who arranged to have Thompson appointed United States Consul to Yucatán and Campeche if he agreed to carry out research among the Maya ruins for the society on his own time. Approval was secured in 1885, and an energetic healthy young man, who in old age reflected: "I have squandered my substance in riotous explorations and am altogether satisfied", left for Yucatán.[46] Lamed by poison from a native trap, bald from jungle fever, deafened from the water pressure encountered diving for answers in the sacred cenote of Chichén Itzá, Thompson more than fulfilled his agreement with Salisbury. The thoroughness of his investigations, to be discussed later, revealed much about the nature of the forgotten civilization and allowed him to formulate various theories about its collapse, embracing internal and external possibilities in an objective and searching spirit. He never fell prey to the dogmatic pitfalls which captured so many who preceded and succeeded him.

It is understandable that most nineteenth century students of Maya antiquity, handicapped by the lack of concrete

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46. Edward H. Thompson, People of the Serpent, Life and Adventure Among the Mayas (New York: Capricorn Books, 1965), p.4.

knowledge of aboriginal peoples, varied so widely in their interpretations of the mysterious ruins and the vanished civilization they represented. The information collected and ideas proposed by these men served as a foundation for more scholarly works and intensive investigations by the emerging breed of professional Maya archaeologists who continued to grapple with the problem of the Classic Maya collapse.

CHAPTER II

INTERNAL CAUSES OF COLLAPSE: CASTASTROPHISM

For the most part the earlier explorations had been undertaken by those caught up in the spirit of the moment. Few of those earlier travellers, easily captivated by ancient ruins and inexplicable cultural mysteries, continued their investigations after returning to their homelands. The sources available to them were sparse and of dubious merit. To continue investigations would, for most, require a return to the sites to gain further information. Those years prior to the close of the nineteenth century were, figuratively and literally, groundbreaking years in the study of the Maya and the recognition of the problem of their collapse. The hodgepodge of theories presented in the previous chapter testifies to the cursory nature of physical investigations undertaken by most curiosity seekers, and reveals that differing interpretations of the collapse existed before any careful studies of the area had been made. But their reports catapulted the Maya into an increasing world-wide prominence as a romantic civilization lost to history.

Several major themes in the history of the Classic Maya collapse had been presented by Fray Diego de Landa in the 1540's.

As previously noted, the account of de Landa did not influence those curiosity seekers prior to Brasseur de Bourbourg's discovery of the abridged manuscript in Madrid in 1863, but was considered the major source for their early history from the time of its first publication. In de Landa we recognize that most of the difficulties assaulting the pre-hispanic Maya were predicated upon a belief in non-interference from contemporaneous non-Maya peoples. In modern perspective, this observation falls easily into the category of internal causes--one of the more workable major divisions for the study of the collapse suggested by Sylvanus G. Morley, and more recently, Jeremy Sabloff, who reviewed theories of the collapse in terms of internal and external causes.[1]

Diego de Landa helped mold later interpretations of Maya history in many ways. His work with the fallen heirs of the Cocomes, a once powerful Yucatecan family, and other native informants, and the establishment of some dates of the Post-Classic period were important to the problem of the collapse. He recognized an essential unity of the Maya over a broad area, especially noting Chiapas, "because many terms and word constructions are identical in Chiapas and in Yucatán, and because there are in Chiapas many remains of places which have been

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1. Sylvanus Griswold Morley, The Ancient Maya, 3rd ed. rev. by George Brainerd (Stanford: Stanford University Press, 1956), pp. 68-73; Jeremy A. Sabloff, "Major Themes in the Past Hypotheses of the Maya Collapse," in The Classic Maya Collapse, ed. T. Patrick Culbert (Albuquerque: University of New Mexico Press, 1973), p. 36.

abandoned."[2] His subsequent remarks about a series of catastrophes quite obviously concerned a later period than the one described today as Classic. He related tales of terrible hurricanes, so strong that the entire peninsula had been devastated, and the trees throughout Yucatán were demolished, "as if the whole had been cut off by scissors."[3] This was followed sixteen years later by a terrible outbreak of "pestilential fevers" from which "very many people died."[4]

There is, of course, no way to analyze the results of such natural catastrophes on a population of so long ago, but we can recognize that prior to the arrival of the Spanish there was still a memory of disasters of unknowable antiquity. With this in mind, it is not illogical to assume that some natural disaster, sufficient in force to affect a wide geographic region, could, in fact, have visited the Maya of Classic years; even if it did not destroy the social system as then organized, it could have contributed to its downfall. This was a theme not considered altogether legitimate in the early twentieth century discussions of the collapse, and though even now it is held an unlikely possibility, it is still debated, and more recent scientific investigations, especially in paleo-osteology, have lent new credence to the possibility of disease as a contributing factor to the collapse.

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2. Alfred M. Tozzer, ed., Landa's Relación de las Cosas de Yucatán, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 18 (Cambridge, Mass: Peabody museum, 1941), p. 30.

3. Ibid, p. 41

4. Ibid.

Yet the first problem mentioned by De Landa--a natural catastrophe like a hurricane--received little support. Violent storms of that nature have long plagued the circum-Caribbean area, but the likelihood of their toppling a civilization as well as the homes of the people is decidedly dim. A natural disaster probably would have to be of a greater magnitude than that of even the most violent hurricane.

Another possible disaster could have come in the form of seismic activity, for Central America is the most active volcanic region in the Americas. Recent earthquakes, as in February of 1976, left widespread devastation of Guatemala through actual damage to buildings, direct casualties, and indirect casualties such as those who succumbed to diseases brought on by unsanitary conditions left in the wake of the disturbances. Even in colonial times the Spanish were forced, after repeated destruction of their first capital site, present day Antigua, to move their capital to what is now Guatemala City, in 1773. Robert C. West, in The Handbook of Middle American Indians wrote that "From the time of his first entry into this area man has had to cope with volcanic castrophe."[5] That the ancient Maya were acquainted with such problems was acknowledged by Manuel Maldonado-Koerdell: "The volcanic activity and seismicity of Middle America were well known to

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5. Robert C. West, "Surface Configuration and Geology of Middle America," Geology of Middle America, Handbook of Middle American Indians, vol. 1, ed. Robert Wauchope (London: University of Texas Press, 1964), p. 76.

pre-Hispanic inhabitants, and recorded in their traditions and hieroglyphs."[6]

Earthquakes were and are present in much of the Maya area; this is undeniable--but how could one hope to prove with any degree of certainty the effects of earthquake activity as long ago as 1000 years? Thomas Gann, a medical doctor and popular travel-archaeological writer of the early twentieth century, briefly related an episode of 1928 in southwest British Honduras while on an expedition sponsored by the British Museum. During the night at the ruins of Chumucha, near the site today known as Pusilha, he awakened to "mutterings and rumblings not unlike distant thunder," though, as he said, "British Honduras is not actually in the earthquake zone we experience a sort of back-wash of all seismic disturbances."[7] Dr. Gann approached the occurence matter of factly; his native laborers did not. The following morning the head man informed Gann they planned to leave, for during the night, the god of a limestone mask which had been excavated the previous day, had warned him, spoken to him, no doubt at the very time of the earthquake, that they must leave or suffer dire consequences. Gann, of course, prevailed upon them to remain, but through this anecdote one can recognize a motivation which easily could

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6. Manuel Maldonado-Koerdell, "Seismicity in Middle America," Geology of Middle America Handbook, ed. Wauchope, p. 26.

7. Thomas W. F. Gann, Discoveries and Adventures in Central America (London: Duckworth, 1928), p. 163.

be underestimated by a less superstitious people--uncertainty and fear that spring from forces beyond the control or understanding of man.

Representative of this basic idea in recent times is Euan MacKie, who also worked on the periphery of Belize, near the Guatemala border at the striking ruins of Xunantunich, perched above the banks of the Mopán River. Not so rash as to postulate a single cause theory, MacKie, who states clearly that he suggests possibilities for this site only, and not the entire area, proposed "a natural disaster, an earthquake, caused damage to the buildings, and was followed immediately after by a social upheaval."[8] However his interpretation of evidence for this theory is for the most part, unverifiable, and based on examination of two particular buildings at Xunantunich. In the first, Structure A-11, he noted:

> All the roof vaults, the outer walls, and large pieces of the substructures had collapsed. The vault blocks lay in large numbers on and near the interior floors, under masses of debris yet often with air spaces between them, suggesting a rapid collapse. (T)he fall of the vaults had shattered some 17 pottery vessels which had been standing on the floor of the long front room. These pots would almost certainly have been removed if the building had remained intact and abandoned for any length of time.[9]

The second building he examined, Structure A-15, of the palacio, a residential style, showed the same signs of rapid collapse. What was especially important was the fact that,

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8. Euan W. MacKie, "New Light on the End of Classic Maya Culture at Benque Viejo, British Honduras," American Antiquity, vol. 27, no. 2 (1961), p. 219.

9. Ibid, p. 216.

though not reconstructed afterward, it was occupied by people much less meticulous in their housekeeping habits than the previous inhabitants. The pre-disaster occupants kept their trash in a refuse pit a respectable distance from the building, while the later ones simply threw it out the doors. Pottery fragments from the refuse pit were of late Classic style (called Period III at this site), while the strewn garbage around the doors of the palacio was of the very next style, the Post-Classic Period IV ware. Weighing such evidence he felt that following substantial damage from an earthquake, "a story of gradually spreading disillusion and indiscipline, stimulated by a concrete example at one site and culminating in the break-down of the Classic culture over a region of uncertain extent, can be dimly discerned."[10]

Supporting evidence for MacKie's thesis is virtually non-existent in the geological and archaeological record, or in historic literature, yet with his cautious disclaimer it seems he does not feel he must be a crusader for this particular catastrophic-social upheaval theory. Rather, one must consider that MacKie attempts to keep alive a possible, if not generally acceptable explanation for the collapse. Years earlier Sylvanus Morley, unable to believe in seismic disturbances simultaneously affecting all the core area, scoffed at such a theory; but if it cannot be proven, neither can it be disproven.[11] With the

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10. Ibid, p. 222.

11. Sylvanus Griswold Morley, "The Inscriptions of Copán," Carnegie Institution of Washington Publication, no. 219 (Washington, D.C.: Carnegie Institution, 1920), pp. 441-443.

continued lack of concrete answers, few proposed solutions can be dismissed summarily.

The same objectivity should be exercised in another possible internal causal factor, which until recent years labored under intense disapprobation: the possible catastrophic effect of pre-hispanic disease. We know from Diego de Landa of the presence of periodic scourges upon the land of Yucatán, for not long after the aforementioned hurricane came the "pestilential fevers. . . . After these had ceased, the bodies of the sick swelled up and broke out full of worms, and from this pestilence very many people died and a great part of the fruits of the earth was left unpicked."[12] Some thirty-six years later, a period broken by civil war, another "pestilence seized them characterized by great pustules, which rotted their bodies with a great stench, so that the limbs fell to pieces in four or five days."[13] While this information cannot be applied directly to the Classic Maya, it must be given credence in the light of those, who, lacking adequate information, have asserted a near idyllic hygenic utopia for the Maya.[14] Inferred evidence dating from early hispanic times and concrete evidence from modern investigations must be considered here.

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12. Tozzer, Landa's Relación, p. 41. 13. Ibid, p. 42.

14. Moíses Behar, "Food and Nutrition of the Maya before the Conquest and at the Present Time," Biomedical Challenges Presented by the American Indian, Pan American Health Organization Publication, no. 165 (Washington, D.C.: Pan American Health Organization, 1968), pp. 114-119; Alfred V. Kidder, "Introduction," Uaxactún, Guatemala: Excavations of 1931-1937, by A. Ledyard Smith, Carnegie Institution of Washington Publication, no. 588 (Washington, D.C.: Carnegie Institution, 1950), pp. 8-9.

Ralph Roys, who has made many contributions to our present knowledge of the Maya, especially with regard to the use of native manuscripts, made available to Mayanists two important works, in both original form and with translation, which touch upon the recognition of disease as a part of daily life. His Ethno-Botany of the Maya reveals a wide variety of native ailments and their proposed botanical prescriptions, while his later publication of Ritual of the Bacabs (gleaned mostly from the unpublished papers of William Gates, who gave the English speaking world its first version of de Landa's Relación) listed even more health problems with shamanic incantations and imprecations for their cures.[15] From his studies of ancient structures at Labná in Yucatán, especially the slightly raised platforms on which dwellings once stood, Edward H. Thompson supported the observation that disease was ever present among the ancient Maya. As he noted at Labná, the

> huts, built directly upon the low, moist soil of the valleys, must have been very damp and stifling in the wet season. The sanitary conditions must have been terrible. Death undoubtedly laid a heavy hand upon the lower classes. Great pestilences could easily have been nursed amid such conditions.[16]

Thomas Gann also noted that disease must always have been prevalent among the Maya in many forms because of their fatalistic attitude toward it:

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15. Ralph L. Roys, Ethno-Botany of the Maya, Middle American Research Series Publication, no. 2 (New Orleans: The Department of Middle American Research, Tulane University, 1931), pp. v-xvii; Ralph L. Roys, ed. and trans., Ritual of the Bacabs (Norman: University of Oklahoma, 1965), pp. ix-xxviii.

16. Edward H. Thompson, "Ancient Structures of Yucatán Not Communal Dwellings," Proceedings of the American Antiquarian Society, n.s. 8 (1892). p. 264.

> Indian men and women of all ages and classes, when attacked by any serious malady, are found to be lacking in vitality and stamina; they relinquish hope, and relax their grip on life very easily, seeming to hold it lightly and as not worth a fight to retain. An elderly man or woman will sometimes take to the hammock without apparent physical symptoms of a disease beyond the anemia and splenitis from which nearly all suffer, and merely announce Ile in cimli, 'I am going to die.' They refuse to eat, drink, or talk, wrap themselves in a sheet from head to foot, and finally do succumb in a very short time apparently from sheer lack of vitality and absence of desire to continue living.[17]

The good doctor did not consider this of any great consequence, for in later years he, in collaboration with J. Eric Thompson would most complacently deny the possibility of any malady wreaking widespread havoc over a broad area. But this attitude would eventually change as advances in medical knowledge affected interpretations of the Maya collapse. Gann first of all insisted that

> only two possible diseases may be considered in this connection, namely Malaria and Yellow Fever. The former is prevalent, often in a malignant form, over almost the whole Maya area, at the present day, yet has never, so far as I know, been the cause of the desertion of even a village, much less a town.[18]

Further, regarding the latter, he continued: "It has been stated that Yellow Fever originated in America, but we have no evidence in support of this assertion, and certainly none that it ever ravaged the Maya area."[19] This was possibly a reply to Herbert

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17. Thomas W. F. Gann, The Maya Indians of Southern Yucatan and Northern British Honduras, Bureau of American Ethnology Bulletin, no. 64 (Washington, D.C.: United States Government Printing Office, 1918), p. 36.

18. Thomas W. F. Gann and J. Eric Sydney Thompson, The History of the Maya (New York: Charles Scribner's Sons, 1937), p. 62.

19. Ibid.

J. Spinden, who stated "There is good reason for believing that the sudden appearance of yellow fever may have had a part in the catastrophe."[20] Ironically, later research has proven, to the satisfaction of most, that malaria was Old World in origin, and while

> for many years yellow fever was thought to be an import from the Old into the New World, discovery of an extensive reservoir of yellow fever among South and Central American monkeys and the transmission of the disease among them by indigenous vectors (the mosquito Haemogogus spegazzinii and the vampire bat) proved the contrary.[21]

Others recently have considered yellow fever pre-Columbian on lexical grounds, "because the Maya used the name Xikik for the black vomitus often observed in this disease."[22] In his introduction to the Ritual of the Bacabs Roys mentions the only curing incantation with which he was familiar prior to the revelation of the Bacabs incantations, M. Rejón García's publication of Supersticiones y leyendas Mayas in 1905, wherein the "blood-vomit", the "xekik", was specified.[23]

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20. Herbert J. Spinden, The Ancient Civilizations of Mexico and Central America, American Museum of Natural History, Handbook Series, no. 3 (New York: American Museum of Natural History, 1928), p. 148.

21. Demitri B. Shimkin, "Models for the Downfall: Some Ecological and Culture-Historical Considerations," in Classic Maya Collapse, ed. Culbert, p. 283.

22. Nevin S. Scrimshaw and Carlos Tejada, "Pathology of Living Indians as Seen in Guatemala," in T. Dale Stewart, Physical Anthropology, in Robert Wauchope, gen. ed., Handbook of Middle American Indians, 16 vols. (Austin: University of Texas Press, 1964-75) 9:217.

23. Roys, Ritual of the Bacabs, p. xxv.

Other maladies, also undetectable archaeologically, have been made known to us ethnologically. Besides various chills and fevers, the Ethno-Botany of the Maya reveals numerous bowel complaints in relation to other illnesses. Some of these, Kiknak (Dysentery), Hubnak (Diarrhea), and Ta kik zoc (Blood in the feces) could have held more danger than the mere discomfort those of the twentieth century might imagine. Indeed the widespread presence of such ailments has been much noticed, and generally acknowledged to play an important role in mortality as well as sapping the vital energies of an individual.[24]

Kenneth Goodner, a bacteriologist from Harvard Medical School, from a study in 1929 noted the practice and results of improper sanitation habits in small towns surrounding Mérida, Yucatán. His first observation, that "the villages of the Mayan Indians are generally located near a cenote," is elementary to those acquainted with Yucatán personally or literarily; his statement that "most of the inhabitants defecate in the yards behind their houses" is probably better known to those who have personally high-stepped rapidly through such unsavory zones, but is important to understanding of disease since "the cenote is apt to be so situated that surface washings from the village are swept into it by every rain."[25] Citing a

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24. Roys, Ethno-Botany, p. ix.

25. Kenneth Goodner, "Bacteriological and Serological Studies in Yucatán in 1929," in George Cheever Shattuck, et al, eds., The Peninsula of Yucatan: Medical, Biological and Sociological Studies, Carnegie Institution of Washington Publication, no. 431 (Washington, D.C.: Carnegie Institution, 1933), p. 211.

greater number of illnesses in the summer months, the rainy season, Goodner felt that

> Although greater heat and humidity during this period (July and August) must have a debilitating effect, it is believed that increased contamination of drinking water during the season of summer rains is an important factor in causing the very high mortality from intestinal infections which exists.[26]

"With such a variety of intestinal infectants the number of cases and deaths due to gastro-intestinal disturbances in Yucatan is not a cause for wonder. The astonishing thing is that any one survives his childhood."[27]

More recently studies in Guatemala have shown the populations

> particularly vulnerable to infectious diarrhea, intestinal parasitism, and other conditions associated with inadequate water supplies and lack of sanitary waste disposal. Even common infections are more likely to have serious consequences because of the simultaneous presence of malnutrition.[28]

Demitri Shimkin also feels that "The importance of infectious diseases as potential factors in the Maya downfall has been improperly minimized by archaeologists", and that "endemic infections of American trypanosmiasis (Chagas' disease), of the Ascaris worm, and of weaning diarrhea" could have "specially deleterious effects on infant and maternal survival and on adult work capacity."[29] Chagas' disease, a protozoan caused malady, which Shimkin believes pre-hispanic because of widespread existence in wild animals, more severely affects children

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26. Ibid, p. 212.
27. Ibid, p. 207.
28. Scrimshaw and Tejada, "Pathology of Living Indians," p. 223.
29. Shimkin, "Models for the Downfall," p. 279.

but does not leave the adult unscathed. Once the parasites move from the blood stream into tissue the neurotoxic substances released by the parasites at this stage destroy ganglion cells, especially of the heart and all the hollow muscular organs."[30] As nerve centers are destroyed, the final stage "produces generalized degeneration in the affected organs, especially the heart, colon, bronchus, and esophogus." This potential killer, once believed rare, is now recognized "throughout the hemisphere including specifically the Maya lowlands."[31]

Another possible factor "particularly associated with heavy, wet soils" and improper waste disposal is infection by Ascaris, the roundworm, which is "of considerable importance in mortality and failures of development among children."[32] The action of harmful bacteria coupled with a variety of parasitic infections such as Ascaris has been shown the cause of many deaths, especially among children, from rather unromantic acute diarrhea. A study of four Guatemalan villages showed that diarrhea accounted for twenty-seven per cent of the total deaths in those villages, while the percentage of those at age one who died was an overwhelming forty-one per cent of the total deaths for that age.[33] These ailments are undetectable archaeologically, and they by no means exhaust the store of possible decimating diseases which

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30. Ibid, p. 283. 31. Ibid. 32. Ibid, p. 281.

33. Nevin S. Scrimshaw, C. E. Taylor, and John E. Gordon, Interactions of Nutrition and Infection, World Health Organization, World Health Monographs, no. 57 (Geneva: World Health Organization, 1968), pp. 226-229, 240-253.

could have drastically affected the Classic Maya in terms of both mortality and energy. Among the Maya of Guatemala today mortality statistics reveal that "bronchopneumonia and tuberculosis are the most important infectious diseases."[34]

While these modern studies are certainly instructive and contain pertinent information to contemporary groups, there is still no way to verify such ailments and their effects on a civilization dead for a thousand years. However, "human skeletons have the potential for providing direct evidence concerning population change and disease burdens."[35] In spite of the paucity and fragmentary nature of remains from the Classic period "properly restored and studied Maya skeletal materials can yield meaningful and pertinent information."[36] Thus far "the history of Maya skeletal studies is somewhat discouraging in terms of productivity," though understandably so.[37] Perhaps the earliest analysis of Maya skeletal material was that of Samuel George Morton, who, in 1842, examined a skeleton brought him from Ticul, Yucatán, by John Lloyd Stephens. No truly significant information was obtained on the basis of one sample, but a new avenue of Maya research was opened.[38]

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34. Scrimshaw and Tejada, "Pathology of Living Indians," p. 221.

35. Frank P. Saul, "Disease in the Maya Area: The Pre-Columbian Evidence," in Classic Maya Collapse, ed. Culbert, p. 301.

36. Ibid.

37. Frank P. Saul, The Human Skeletal Remains from Altar de Sacrificios, An Osteobiographic Analysis, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 63, no. 2 (Cambridge, Mass: Peabody Museum, 1922), p. 70.

38. Ibid.

Even though others, through the years of growing interest in Maya research, would examine the skeletal remains from other locales, including Peabody Museum's Ernest Hooton, who examined some forty-two incomplete skeletons recovered from Edward H. Thompson's dives into the Sacred Cenote at Chichén Itzá, little was accomplished in the way of osteitic pathology because of the limited understanding of the nature of lesions remaining on the recovered material. Whether particular lesions were due to nutritional deficiencies or imbalances, or to injury, could not be ascertained, and such matters were complicated by another question of importance--the controversy over the Old or New World origins of syphilis.

In spite of doubts to the New World origin of the disease George Shattuck was convinced from "Paleo-osteological evidence that syphilis existed among the Indians in pre-Columbian times."[39] Admitting to this, the problem was now to determine what its effects might have been on the population. Kenneth Goodner in 1929 undertook a survey to gather information about the incidence of syphilis in the indigenous population, and the severity of its effects. A clinic was established at Chichén Itzá, Yucatán, a place central to a number of small villages in the area. Using the Kahn method, the clinic tested a total of 271 individuals, including 150 Maya and 121 mestizos. The results were curious, especially considering the main currents

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39. George Cheever Shattuck, "Syphilis in Yucatán and Related Immunological Questions," in Shattuck, et al, eds., Peninsula of Yucatan, p. 282.

of medical thought about syphilis. Of those tested, only one positive identification of the disease was noted among the Maya; a 97.3% negative for full blooded Indians. The mestizos showed a slightly higher incidence: ten of them were identified as carriers for an 88.4% negative response for those of mixed blood.[40] That led him to postulate "that the Indians are relatively resistant or are not susceptible to syphilis," or "that the disease exists in a mild form, unrecognized clinically."[41] If either of those suggestions were true, it would be quite contrary to the accepted general opinion "that there is no race of human beings known to have immunity to syphilis. It seems improbable," he concludes, "that the Maya has an immunity."[42] His study then, like so many others, raised as many questions as it supplied.

Dr. Shattuck followed up Goodner's study the following year by carrying out more tests in Yucatán, this time at Valladolid, where syphilis was known to exist to a greater degree. Indeed, the results of his tests showed a higher incidence among both mestizos and full bloded Maya, but with still a far lesser recognizance among the indigenistas. He included a comparative study with other indigenous groups in the Americas which, coupled with the studies in Yucatán, produced, like Goodner, "evidence in favor of the existence of a racial resistance or incomplete immunity to syphilis in the Maya and in

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40. Goodner, "Bacteriological and Serological Studies," p. 218.

41. Ibid, p. 219. 42. Ibid, p. 210.

the Maya-Mestizos of Yucatán and also in the Indians of Central America and of Southern Mexico generally."[43]

Not entirely satisfied with the verifiability of his own or Goodner's tests after discussion with others, "who pointed out the difficulty of interpreting the Kahn reactions which were performed upon the Maya in the absence of thorough and repeated physical examinations" Shattuck addressed a number of questionnaires to Dr. Alberto Berrón, a physician and president of the "Sociedad Médica Yucateca" and thirteen fellow members of the society.[44] After consulting with these practicing physicians Berrón reported that

> He has observed no evidence of active syphilis in pure-blooded Maya; that he considers all stages of syphilis to be common in White Yucatecans and in Maya-Mestizos; and that he finds that in these two groups the disease generally gives severe manifestations but that latent cases are common also.[45]

Such perplexing findings were left untouched for years, as paleo-osteology found no immediate champions among Mayanists. A study of 1953, however, contributed information contrary to the "natural immunity" theory. Charles W. Goff examined skeletons from the highland Maya site of Zaculeu, Guatemala, and on one skull noted "evidence of an extensive sclerosing process with focal necrosis, thinning bulging and an heroic attempt at healing, all clearly observed."[46] Eliminating other possible causes he felt that

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43. Shattuck, "Syphilis in Yucatán," p. 283.

44. Ibid, p. 284. 45. Ibid.

46. Charles W. Goff, "New Evidence of Pre-Columbian Bone Syphilis in Guatemala," in Richard Woodbury and Aubrey S. Trik, eds., The Ruins of Zaculeu (Boston: United Fruit Company, 1953), p.314.

> syphilis might have been the destructive agent. The major process was essentially local yet there were also signs of a general osteitis scattered over the entire skull. The loss of substance in the parietal portion presented every sign of a gumma, with an attempt at healing. Involvement along the course of the meningeal artery points to an arteritis, well known in the tertiary stage.[47]

Other skeletons from the same site, examined by T. Dale Stewart produced other cranium which revealed a probably syphilitic disease as well.[48] Frank Saul, basing his discussion on some ninety separate partial skeletons found at Altar de Sacrificios, at the juncture of the Pasión and Salinas rivers in the Petén, Guatemala, concluded that "skeletal lesions indicate the presence of important health problems throughout the known past and a chronic precarious health status would be likely to magnify the impact" of other "negative occurrences, and thus could lead to the collapse of the Classic Maya."[49] Of late Classic skeletons excavated at Altar some eighteen per cent showed evidence of osteitis, or disease which leaves permanent scars on the bone tissue.[50] The cause of the lesions has been debated, but he feels confident that "many of the osteitic lesions and cranial gumma found at Altar and also at Seibal are associated with both syphilis and yaws as seen today."[51]

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47. Ibid, p. 315.

48. T. Dale Stewart, "The Skeletal Remains from Zaculeu," in Woodbury and Trik, eds., Zaculeu, pp. 295-311.

49. Saul, "Disease in the Maya Area," in Classic Maya Collapse, ed. Culbert, p. 321.

50. Ibid.

51. Ibid.

Present or absent, a "mere description of lesions is less important than the statistical data referring to how a particular human group was affected by illness in a given period."[52] This, of course, points up a major drawback to all theories advanced in this study, but especially to the least documentable ones of earthquake and disease studies of both living Maya and ancient skeletal remains. Yet the modern status of disease studies with regard to the ancient Maya is given far more credence today than its companion catastrophic theory. Perhaps a future trend in collapse studies will soon emerge, for Richard Adams recently stated:

> there are some factors about disease which make it a more likely element in the collapse than previously believed. The post-Conquest depopulation is the only documented New World case of a demographic decline comparable in scope to that of the Maya collapse, and it was clearly disease related.[53]

However, this comparison of Adams neglects to mention the post-Conquest setting, and the means by which the Spaniards gathered the scattered Indian population into newly formed towns where the spread of an epidemic was facilitated.

In spite of new trends of research in paleo-osteology and a willingness of Mayanists of Adams' stature to assign a greater role to the impact of disease on the Classic Maya, the internal theories of catastrophism still belong to the

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52. Eusebio Davalos Hurtado, "Pre-Hispanic Osteopathology," p. 68.

53. Richard E. W. Adams, "The Collapse of Maya Civilization: A Review of Previous Theories," in Classic Maya Collapse, ed. Culbert, p. 28.

"weak sister" category of hypotheses treating the Maya collapse. There is precious little documentation for such theories, and in some cases, none at all. When exploring a question like the Maya collapse, catastrophism must be relegated to a subordinate status among more documentable and realistic difficulties, of internal and external causation--like a subsistence breakdown, "civil" war, or invasion.

CHAPTER III

INTERNAL CAUSES OF COLLAPSE: THE SWIDDEN CONTROVERSY

The health of a society depends upon the health of its individual members. Far more important than disease to the health and stability of the Maya was the nature and quality of its food supply. This, understandably leads to difficulties among Mayanists, who in dealing with subsistence must take into account numerous variables, including diverse geographic areas conducive to different subsistence patterns and technologies, the questions of soil fertility and potential for sustaining a large population within each area, the role of climate and its possible beneficial or detrimental effects on crops, and a multitude of peripheral questions which remain debatable, even including doubts about foods utilized by the ancient Maya. As set forth by Jeremy Sabloff in The Classic Maya Collapse, this internal hypothesis may be termed "the natural/limited-ecological-potential" problem.[1] Though Sabloff includes the role of climatic change in his mention of "natural/catastrophic" hypotheses, for purposes of this study, climatic change will be viewed chiefly in terms of its possible effects on Maya ecology. Pressures

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1. Jeremy A. Sabloff, "Major Themes in the Past Hypotheses of the Maya Collapse," in The Classic Maya Collapse, ed. T. Patrick Culbert (Albuquerque: University of New Mexico Press, 1973), p. 37.

resulting from a failure to supply adequate amounts and quality of food to its population could have caused the exodus of the Maya from ceremonial complexes to less densely populated, more fertile subsistence units. Gustavo del Castillo Vera states the problem in this manner:

> In regard to swidden agriculture the disappearance of the Maya civilization may be in close relationship. This relationship may be direct or indirect. Direct because swidden agriculture at one point in time may have broken down, unable to produce for the general population; indirect because any interference with the supplying of agricultural surplus to the priests would have extinguished the priesthood, made useless the religious centers, and broken down the incentives for the population to gather into villages so as to produce an agricultural surplus.[2]

The agricultural system of the Maya at some point during the Classic period may have failed to provide adequate amounts of food. Examinations of late Classic skeletal material seem to show evidence of malnutrition even among the upper classes, a possibility noted by several Mayanists, and such clues lead one directly to studies of Maya sustenance patterns.[3]

Basic to the problem of subsistence is an assumption of long standing--that the Maya chiefly depended upon maize as a staple. According to J. Eric Thompson:

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2. Gustavo del Castillo Vera, "Swidden Agriculture and its potential for sustaining high civilizations. The Case of the Maya," Separata del Suplemento Antorpológico de la Revista del Ateneo Paraguayo, vol. 4. no. 2 (1969), p. 245.

3. William A. Haviland, "Stature at Tikal, Guatemala: Implications for Ancient Maya Demography and Social Organization," American Antiquity, vol. 32, no. 3 (1967), pp. 316-325; Richard E. W. Adams, "The Collapse of Maya Civilization: A Review of Previous Theories," in Classic Maya Collapse, ed. Culbert, p. 29.

> Maize was a great deal more than the economic basis of Maya civilization; it was the focal point of worship. Without maize the Maya would have lacked the leisure and the prosperity to erect their pyramids and temples; without their mystical love for it, it is improbable that the peasants would have submitted to the unceasing and stupendous program of building directed by the hierarchy. The Maya laborer knew that he was building to conciliate the gods of sky and soil, on whose care and protection his maize field was dependent.[4]

Until recently this view was not seriously challenged, for a wealth of evidence supports a dominant maize culture. Indeed the Popol Vuh of the Quiché Maya reveals that only when beings were formed from ground maize were the gods at all satisfied with the creation of man.[5] It is but a short step from this mythological-historical tale to conclude that the importance of maize was basic to tradition and diet. Returning to an even earlier evidence of a "maize culture" we find the art of the Maya enlightening, for the god of maize, variously represented, is present throughout the Maya area in sculpture from Copán, Honduras, on well preserved stele from Seibal, in the Department of Petén, Guatemala, and numerous other locales.[6] Sources from the sixteenth to twentieth centuries are rich in references to maize cultivation. The oft cited Diego de Landa noted in his history that of the Yucatecos, "the greatest

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4. J. Eric S. Thompson, The Rise and Fall of Maya Civilization, 2nd ed. (Norman: University of Oklahoma Press, 1966), p. 270.

5. Munro Edmonson, ed. and trans., The Book of Counsel: The Popol Vuh of the Quiché Maya of Guatemala, Middle American Research Institute Publication, no. 35 (New Orleans: Tulane University, 1971), pp. 145-148.

6. J. Eric Thompson, Rise and Fall, pp. 265-266.

number were cultivators and men who apply themselves to harvesting the maize." This maize was "their principal subsistence" and was used in various concoctions "both as food and drink".[7] Such a dependence was still much in evidence in the late nineteenth century according to Consul Edward H. Thompson, who estimated that maize accounted for roughly eighty per cent of the total consumption of the Yucatec Maya.[8] While the good consul's statistic is fair game for scientific criticism, it should be noted that Thompson's observations in most respects have proven quite sound, and there should be little doubt that maize was the staple article of diet among the Maya of Thompson's time as it is in the twentieth century.

Given what seems the fair assumption that maize consumption was of paramount importance to the Maya in ancient as well as modern times, we must follow with another assumption--that then, as now, swidden agriculture, the slash and burn system, was the dominant technology in use. Briefly described

> The slash-and-burn system . . . consists in clearing a section of the forest at a time propitious to the drying of the cut vegetation, which is then set on fire. After the fire, the soil is seeded with a digging stick and later weeded periodically. After a varying but generally short time-span, the soil is

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7. Diego de Landa, Landa's Relación de las Cosas de Yucatán, ed. Alfred Marston Tozzer, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 18 (Cambridge, Mass: Peabody Museum, 1941), p. 89.

8. Edward H. Thompson, "Ancient Structures of Yucatán Not Communal Dwellings," Proceedings of the American Antiquarian Society, n.s. 8 (1892), pp. 265-266.

> exhausted and the yield decreases. The field is then abandoned to permit the regeneration of the soil and the return of the forest. A new section is then cut to continue the agricultural cycle.[9]

Even a cursory glance at the description of this world-wide tropical technology seems to point out inherent shortcomings to its continued use in a localized area. In 1909 Orator F. Cook postulated the effects such technology might have had on the Classic Maya, that "their existence was definitely limited by methods of agriculture which denuded the country of its forests, and destroyed the fertility of the soil."[10] The argument of Cook requires close scrutiny, for it formed the basis for many later supporting and opposing positions. The title of his 1921 paper, "Milpa Agriculture, A Primitive Tropical System", is in itself indicative of Cook's viewpoint.

To keep terminology clear, Robert C. West and John P. Augelli point out that "slash-burn cultivation is often mistermed 'milpa' agriculture. In Mexico and Central America, the word 'milpa' is applied to any cultivated field (but principally one in which maize is grown), regardless of the system of agriculture used."[11] Cook did not make this

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9. Angel Palerm, "The Agricultural Basis of Urban Civilization in Mesoamerica," Irrigation Civilizations: A Comparative Study, ed. Julian Steward (Washington, D.C.: Pan American Union, 1955), p. 28.

10. Orator F. Cook, "Vegetation Affected by Agriculture in Central America," United States Bureau of Plant Industry Bulletin, no. 145 (Washington, D.C.: The United States Government Printing Office, 1909), p. 23.

11. Robert C. West and John P. Augelli, Middle America, Its Land and Peoples (Englewood Cliffs, N.J.: Prentice-Hall, 1966), fn., p. 244.

distinction, but at the time it made little difference to his thesis. He believed that following repeated burnings of vegetation, "the woody growth is restored less rapidly . . . and a state of complete denudation and exhaustion of the soil may be reached." Finally, "The genuine forest growth gives place to other plants that are adapted to the more open and exposed conditions of the burnt-over lands, and eventually some of the large perennial grasses become established . . . to the exclusion of other plants."[12] Such grass lands, savannas, are not sufficiently cleared by burnings to kill sturdy roots and allow the growth of crops, and so "the milpa system carries with it the agency of its own destruction in producing the grasslands that are not amenable to the kind of cultivation that the system provides."[13] It is highly unlikely that the Maya could have plowed grasslands without draft animals. Thus, Cook maintained, "Only a small, scattered population can secure permanent support from the milpa system of agriculture."[14] This problem offered a plausible explanation for the demise of the Maya:

> The ancient cities and sculptured monuments of Central America show that relatively large, centralized communities must have existed, and limitations of the native system of agriculture may explain why the ancient centers of population were abandoned."[15]

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12. Orator F. Cook, "Milpa Agriculture, A Primitive Tropical System," Annual Report of the Smithsonian Institution, 1919 (Washington, D.C.: Smithsonian Institution, 1921), p. 310.

13. Ibid, p. 311. 14. Ibid. 15. Ibid, p. 326.

The views of Cook were received warmly by Sylvanus G. Morley. A pioneer and major figure of Maya archaeology, Morley began his studies of the Maya in the first decade of the twentieth century, and in his exuberant style presented masses of information to specialists as well as to a popular reading audience. His major contributions centered about his ceaseless forays into the "bush" for dated monuments, which he analyzed painstakingly to establish a more concrete chronology of the Maya. Noting a gradual cessation of dated monuments prior to 600 A.D., Morley believed that a major epoch of Maya history had ended.[16] This first period, roughly from the time of Christ to the seventh century, he termed the Old Empire, a time when the Maya flourished in the south-central lowlands, especially in the Petén and Chiapas regions. The available evidence pointed to "a great exodus from the southern region . . ., not taking place all at once, but distributed over several centuries, beginning as early as the fifth century."[17] A New Empire was then established in Yucatán with its capital in Chichén Itzá.

The exodus Morley documented by the latest stele date at each site. He concluded that it began "in the extreme west (Palenque) and south (Copán) and moving eastward and

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16. Sylvanus Griswold Morley, "The Rise and Fall of the Maya Civilization in the Light of the Monuments and the Native Chronicles," Proceedings of the 19th International Congress of Americanists, 1915 (Washington, D.C.: 1917), p. 144.

17. Ibid, p. 145.

northward, the last cities to be abandoned" were those of the Petén.[18] In accordance with the agricultural difficulties proposed by Cook, Morley imagined "the ancient inhabitants of Copán, Tikal and the other southern Maya cities as being driven farther and farther from their homes in order to find suitable forested regions in which to make the clearings for their milpas."[19] To him it best explained the "progressive abandonment of the Old Empire cities," a "replacing of the forests by grassy savannas, and the end of cultivability so far as the Maya agricultural methods were concerned, " and "must have come about gradually, reaching really acute stages at the different cities at different times, depending upon such variable factors as their relative sizes and ages, and the general fertility of their surrounding regions."[20] Therefore, it was "not surprising to find that Copán was one of the first of the larger cities to have been abandoned. Not only was it one of the very oldest of the cities, but also it was located in a small valley where the area available for cultivation was comparatively restricted."[21]

Sylvanus Morley's basic acceptance of O. F. Cook's thesis added the weight of archaeological authority to what certainly appeared a sound botanical observation regarding the swidden system of agriculture, that over long periods of time it not

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18. Sylvanus Griswold Morley, The Inscriptions of Copán, Carnegie Institution of Washington Publication, no. 219 (Washington, D.C.: Carnegie Institution, 1920), p. 444.

19. Ibid, p. 454. 20. Ibid, p. 457. 21. Ibid.

only had the deleterious effects on the rich humus which supported vegetation, but allowed an untillable grassland to develop and thereby literally choke the agricultural potential of the Classic Maya. The stage was thus set for another controversy about the ancient Maya. Could slash and burn agriculture support the populations which must have existed during Classic times? If not, what were the specific deficiencies of the system? Morley's latest statement gave more emphasis to the problems of the encroachment of grasses, but what of the problems of soil fertility? Could other factors be involved as well? Such questions met with a wide variety of comment, some of which will now be examined.

Many readily accepted the general assumptions of the destructive limited potential of swidden agriculture. Frans Blom and Oliver LaFarge, writing for a Tulane University publication in 1927 (prior to the official foundation of the well known Middle American Research Institute), were certain that Maya agricultural practices were "very wasteful," that after "three to four plantings . . . the soil is burnt out and exhausted. In this way great tracts gradually became waste land."[22] Cyrus L. Lundell, who was to make major contributions to botanical knowledge of the Maya area, wrote an informative article entitled "The Agriculture of the Maya."

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22. Frans Blom and Oliver LaFarge, Tribes and Temples, A Record of the Expedition to Middle America Conducted by the Tulane University of Louisiana in 1925, 2 vols. (New Orleans: Tulane University, 1927), 1:239.

In its pages he voiced his acceptance of the "very destructive" Maya slash and burn techniques. He, like LaFarge and Blom, but unlike Morley, saw the chief danger as impoverishment of the soil, "for even though the ashes are fertilizing, the destruction of the humus is harmful to the soil. Also, the valuable ash constituents are very soluble, so that they are largely washed away or lost through leaching when the heavy rains fall."[23] Years later he would expand his view of such effects, and note that following

> the thousands of years that the Maya followed this practice, they wrought basic physical and chemical changes in the soil. Continuous cropping and erosion surely depleted the vital supply of soil phosphorous. Under the high annual rainfall, erosion accelerated in the denuded areas, stripping them of top soil, and choking the lowland basins with silt.

After those years of declining yields, the

> failure of Maya agriculture may well have served as the catalytic agent which led to the ultimate crisis in a tired and degenerating culture. Only thus can we account satisfactorily for the almost simultaneous abandonment of such great centers as Tikal and Piedras Negras with their varied physical environment.[24]

Here we note variations of the basic swidden controversy: a soil becoming leached of phosphorous content, and a statement about erosion, a new twist to the problem which shall be discussed subsequently. But not all were satisfied with the belief that swidden agriculture permanently damaged the soil.

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23. Cyrus L. Lundell, "The Agriculture of the Maya," Southwest Review, vol. 19 (1934), p. 74.

24. Cyrus L. Lundell, "The Flora of Tikal," Expedition, vol. 3, no. 2 (1961), p. 53.

While admitting the problem of savanna encroachment, geographer Hugh Bennett wrote as early as 1926: "Much will be found about soil exhaustion, and much of that will not be true. By this it is not meant that the productivity of the land has not depreciated temporarily, but there has not been any great amount of permanent soil exhaustion."[25] He noted the declining yields under the swidden technology, but pronounced the results due to "inadequate soil aeration and incorporation of humus in the absence of cultivation." If the Maya did not cultivate the soil, "there may have been temporary soil impoverishment," but only temporary, since he observed that "the same lands today produce splendid crops."[26] J. Eric Thompson, who advocated a far different theory of collapse, also disagreed regarding the destructive nature of Maya technology and noted "that the soil around Quirigua, frequently fertilized by floodings of the Motagua River, is very rich, yet Quirigua was one of the earliest cities to cease functioning."[27] Taking care to be kind to the memory of his late friend, former boss and colleague in the field, Thompson also disagreed with Morley on the point of savanna encroachment. His personal observations of a once important Maya town, Chichanha, in

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25. Hugh H. Bennett, "Agriculture in Central America," Annals of the Association of American Geographers, vol. 16, no. 2 (1926), p. 67.

26. Ibid, p. 67; 68-69.

27. J. Eric Thompson, Rise and Fall, p. 102.

Quintana Roo, revealed that the town, abandoned in 1852, had reverted to thick forest, "to a layman indistinguishable from the surrounding virgin forest. In fact," he continued,

> it was not until I saw the walls of houses and gardens and then the ruined church that I realized that I was riding down former streets and across what had once been an extensive plaza. Thus forest will quickly displace grass, even when, as in the plaza of Chichanhá, it had been established for very many years.[28]

Others, like Ursula Cowgill, took a more radical stance and maintained that not only was the swidden system "the most efficient possible," but that a major agricultural failure was "not likely."[29] In accordance with her studies, observations of modern practices in the Petén, and interviews with milperos, she first ruled out the notion that "exploitation of the land leads to invasion by grass" and held that savannas, at least in the Maya lowlands were "clearly a natural phenomenon and not man made."[30] After taking soil samples from milpas in use and those plots in rostrojo (secondary growth), "chemical analyses . . . were performed to determine total nitrogen, organic matter, plant available phosphorous, exchangeable sodium, potassium, calcium, magnesium, and Ph. These items were studied in relation to the effects of burning,

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28. Ibid, p. 103.

29. Ursula M. Cowgill, "An Agricultural Study of the Southern Maya Lowlands," American Anthropologist, vol. 64, no. 2 (1962), p. 283.

30. Ibid, p. 278.

of cultivation, and of rest."[31] Except for potassium and magnesium, all other chemical nutrients declined enough in her opinion to cause decreasing harvests, but she felt it "conservative to conclude that stable swidden agriculture can be carried out on the basis of four years' rest after a single crop, or six to eight years' rest after two successive crops."[32] Nonetheless, she recognized some peripheral problems in yield decline, among them the "competition of weeds with cultivated crops either for sheer space, nutrients, or water; and increased prevalences of insect or other pests."[33] But Cowgill, in keeping with advances in archaeological-ethnographic studies, linked her observations of soil fertility with a crucial issue: how many people could be supported in a given area under swidden technology? Her data from San José near Lake Petén showed that one man, with slight help could

> care for up to 13 acres under cultivation in any one year. This is enough to supply the maize requirements of 12.6 people, and since reported size of household averaged 5.78 people, this implies that more than half the total labor supply is potentially available for construction of monumental centers and specialist activities.[34]

Given the yields recorded during her field work, she felt that Maya agriculture "could support a population of 100 to 200 people per square mile."[35]

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31. Ursula M. Cowgill, "Soil Fertility and the Ancient Maya," Transactions of the Connecticut Academy of Arts and Sciences, vol. 42 (1961), p. 53.

32. Cowgill, "Agricultural Study," p. 276.

33. Ibid, p. 279. 34. Ibid, p. 277 35. Ibid, p. 283.

As useful as Cowgill's collected data and analysis have been, her interpretation has not been without its critics, especially since she maintained her data were "applicable to conditions during the Classic Period."[36] Rubén Reina wrote in response to Cowgill that her studies omitted "various human factors other than distance, acreage and help."[37] First he noted the perennial drawbacks--that "few milperos can produce a maximum yield from their fields because of the many problems that arise . . . such as illness; lack of help; the destructive actions of strong winds, animals, or insects; and low yield due to poor soil or poor quality seed."[38] If Cowgill's optimistic findings could be projected into the past as distant as Classic times, why, then, in historic times, did "Archival documents reveal a constant shortage of grain in the Petén, despite the fact that milperos have continually sought to produce the best possible harvest"?[39] A study of records from 1810 to 1924 of the very town Cowgill used as a model, San José, proved to Reina that "In historical times San Joseños faced periods of near starvation, times when only the Ramon seed, obtained from a jungle tree, was available for tortilla making."[40]

While acknowledging the contribution of Cowgill, William Haviland agreed that "agriculture in the Petén may be more

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36. Ibid, p. 275.

37. Rubén Reina, "Milpas and Milperos: Implications for Prehistoric Times," American Anthropologist, vol. 69, no. 1 (1967), p. 13.

38. Ibid, p. 14. 39. Ibid, p. 15 40. Ibid, p. 17.

productive than previously judged, though not necessarily as productive as Cowgill would allow." He had misgivings, since she did not take into account "how much of a crop must be devoted to procuring seeds for subsequent crops."[41] Another reservation was that

> socio-religious factors might have a profound influence on the practice of milpa agriculture, and could limit production to levels below those allowed by Cowgill. Are there regions where, for religious reasons, a man may not milpa? Is there a limit to the size of the milpa, other than how much may be theoretically cared for?"[42]

Such unknown quantities called for more sustained research into the problem.

Yet in such recent arguments a trend may be noticed. No longer do the theoretical arguments focus on agriculture, or soil fertility, each as a question all to itself, but the question is now linked to populations. If the effects of slash and burn agriculture were serious enough to cause the collapse of the Maya, how could one argue the point seriously without adequate information regarding the population of a given area? Recognition of this problem gave rise to further specialized areas of research regarding settlement patterns and demography. This led Maya research down new avenues, for no longer would excavations leave untouched the lesser mounds surrounding

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41. William A. Haviland, "Maya Settlement Patterns: A Critical Review," Archaeological Studies in Middle America, Middle American Research Institute, Tulane University Publication, no. 26 (New Orleans: Tulane University, 1966), p. 36.

42. Ibid.

the massive pyramidal structures as had been the case in the past. If answers could be found, they would be in relation to the mass of the extinct population. Studies of house mounds would be pursued more diligently to provide population estimates and a sustaining area,

> the area occupied by a population whose religious and political ties are to one specific ceremonial center, who supplied the labor for construction and maintenance of the center, and who provide food and services for those specialists concerned with religious and administrative duties.[43]

Such studies are still in their infancy, and as William T. Sanders noted, most of the small number of settlement pattern studies

> have involved intensive surveys of very small districts adjacent to major political centers, and the data have been extremely deficient in what we would call rural settlement patterns. Large-scale surveys comparable to recent surveys conducted in Central Mexico, in highland Guatemala, and in the Valley of Oaxaca have not been conducted in the Maya area.[44]

It will be some time before sufficient data has been gathered to make any but the most tentative speculations. Yet Tikal has been the site of the most ambitious such project to date with the mapping of some six square miles of the central area.[45] Information remains sketchy, but "studies in the Southern Maya Lowlands . . . show . . . a definite increase of population

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43. Ibid, p. 28.

44. William T. Sanders, "The Cultural Ecology of the Lowland Maya: A Reevaluation," in Classic Maya Collapse, ed. Culbert, p. 326.

45. William R. Coe, Tikal: A Handbook of the Ancient Maya Ruins (Philadelphia: University of Pennsylvania, University Museum, 1967), p. 21.

density from the Middle Preclassic to Late Classic times, then a catastrophic and rapid population decline during the Post-classic."[46] Population estimates for the central area of Tikal, the mapped portion of the site, show "that at least 10,000 people were permanent residents of Tikal."[47] The area surrounding the center, though less densely populated might have added to this number thousands more, giving "greater" Tikal a population of as many as 45,000.[48] This figure is far too high for T. Patrick Culbert, who felt that "the population of Tikal could not have been locally supported by a subsistence system comparable to that known from ethnographic accounts," especially since a figure of "30-60 persons per square kilometer" had been "estimated as maximal for a slash-and-burn agricultural system in rain forest."[49]

Betty Meggers of the Smithsonian Institution, like Culbert, agreed that the swidden system could not have supported Tikal, or other major centers of population, through the centuries. Her reasoning, however, took a radical departure from that of others treating Maya agriculture. In another of numerous attempts to prove anthropology a true science, Meggers proposed a "law of environmental limitation on the development of

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46. Sanders, "Cultural Ecology," in Classic Maya Collapse, p. 331.

47. W. R. Coe, Tikal, p. 105.

48. William A. Haviland, "Tikal, Guatemala and Mesoamerican Urbanism," World Archaeology, vol. 2, no. 2 (1970), p. 190.

49. T. Patrick Culbert, "The Maya Downfall at Tikal," in Classic Maya Collapse, ed. Culbert, p. 72.

culture."[50] She classified the lowland Maya environment as an area "of limited agricultural potential" by dependence on swidden technology, where "productivity is minimized by limited soil fertility."[51] Since there were no examples of a culture maintaining itself at a high level in such an environment over a period of years, she felt "that a culture of the level attained by the Classic Maya could not have developed in the . . . environment where the archaeological remains are found, but must have been introduced from elsewhere." Therefore, "the history of the Maya occupation of the tropical forest should represent a decline or deculturation."[52]

To bolster her argument Meggers quoted several archaeological authorities and noted "a lack of transition between pre-Classic and Classic culture . . . that should not exist if the latter is an indigenous development."[53] Such arguments, which lay far from the traditional boundaries of cultural interpretation, were met with severe criticisms. William R. Coe considered her opinion on "the incongruity of environment and local cultural complexity . . . simplistic, if not ill-founded."[54] Using evidence from the Peten, Guatemala, Coe found a concrete example of cultural continuity in "the intricate evolution of

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50. Betty J. Meggers, "Environmental Limitation on the Development of Culture," American Anthropologist, vol. 56, no. 5 (1954), p. 808.

51. Ibid, p. 802. 52. Ibid, p. 817. 53. Ibid, p. 818.

54. William R. Coe, "Environmental Limitations on Maya Culture: A Reexamination," American Anthropologist, vol. 59, no. 2 (1957), p. 328.

a Maya lowland structure like A-V at Uaxactun."[55] Using Meggers' own argument that if the law of environmental limitation "is a true cultural law, it must have no exceptions," Coe considered her reasonably refuted.[56] Yet Coe went further still, and in this writer's opinion, utterly demolished her argument by exploring her documentation which was "often inadequate and even prejudicially selected."[57]

Richard E. W. Adams, commenting on Meggers' theory, noted that since the Meggers versus Coe argument,

> much more evidence for the in situ development of Maya culture has appeared, and other more convincing alternatives have been available. Finally, the newer studies of the swidden system, as well as the Tikal sustaining area studies, have indicated a much higher potential for population support than was previously thought possible.[58]

There are no doubts that many questions remain unanswered about the nature of swidden agriculture and its potential for supporting a substantial population, or if the ancient Maya depended primarily upon it. Whether one follows the optimistic estimates of Ursula Cowgill, or Meggers' disbelief in the swidden system as a viable mode of subsistence over a period of centuries, there is sufficient room for cogent arguments in support and opposition of each. Yet another idea has been

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55. Ibid, p. 331.

56. Meggers, "Environmental Limitation," p. 817; William R. Coe, "Reexamination," p. 331.

57. Ibid, p. 334.

58. Adams, "Review of Theories," p. 28.

proposed recently in what William T. Sanders has termed "a very provocative book"-- The Conditions of Agricultural Growth by Esther Boserup.[59]

Boserup turned to the traditional model of subsistence in which food production was "a limiting factor for population growth" and proposed that "population growth" was the "major factor determining agricultural development."[60] She, unlike most, did not view the swidden system as a changeless agricultural technology. Due to pressures from a growing population, there was less agricultural land available, and the fallowing period had to be shortened, which in turn, led to the need for intensive cultivation.[61] Intensive cultivation necessitated new technologies, and as Sanders commented, the slash and burn technology, "instead of being viewed as a primitive and static system, is viewed as a pioneer stage of occupation of new territory by subsistence farmers."[62]

Sanders, however, found problems with application of Boserup's studies to the Maya, as her researches were largely based on Asian swidden agriculture, where metal was used for implements and soils varied so greatly. In the Maya area,

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59. Sanders, "Cultural Ecology," p. 332.

60. Esther Boserup, The Conditions of Agricultural Growth, (Chicago: Aldine Publishing Company, 1965), pp. 12; 11.

61. Ibid, pp. 16-17.

62. Sanders, "Cultural Ecology," pp. 332-333.

"not all soils are capable of sustained intensive cultivation."[63] Her thesis, "that the typical sequence of development of agriculture has been a gradual change--from extensive to intensive types of land use," is interesting in that it seems to support Betty Meggers' much chastised view of an "immigrant" Maya civilization, and a collapse caused by an apparent failure of the Maya to adapt to the stresses of population growth with new technology.[64]

As in so many cases, when dealing with a multitude of unknown factors, the swidden question remains the subject of much debate. Competent authorities and logic can support either side of the issue of the capability of the Maya to develop a specialized social system based on the assumption that swidden agriculture, with a preponderant reliance on maize, was the primary means of subsistence. For years various theories of agricultural collapse gained increasing numbers of adherents among Mayanists, but with the almost heretical work of Ursula Cowgill, a temporary stumbling block was placed in the way of those who considered Maya maize culture doomed by the use of slash and burn technology. Even noting criticisms of Cowgill's work, since the early 1960's many swidden-disaster supporters modified their views, especially in the light of other subsistence studies of the past two decades which focused on very

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63. Ibid, p. 334.

64. Boserup, Agricultural Growth, p. 181; Betty J. Meggers, Prehistoric America (Chicago: Aldine-Atherton, Inc., 1972), p. 65.

different aspects of the nature of Maya sustenance. Since an overwhelming number of works and a number of prominent Mayanists have supported the relationship of the Classic collapse to agricultural shortcomings, attention must be given to those who, for various reasons, disagreed as a result of their own studies of Maya subsistence potential.

CHAPTER IV

INTERNAL CAUSES OF COLLAPSE: SUBSISTENCE ALTERNATIVES

Following the previous examination of representative arguments on the productivity versus inherent shortcomings of maize cultivation in conjunction with the swidden system of agriculture, attention must now be focused on observations and studies which raise other questions or offer alternative explanations for the Classic Maya collapse. Previously it has been noted that many questions remain unanswered about the nature of Maya subsistence, and the preponderance of discussion focusing on maize-dependence may have obscured less likely, but potentially viable, theories which approach the subsistence problem from other perspectives. Some of these ideas concentrate on alternative sources of subsistence and their implications for the quality of Maya life, while others are related to agricultural problems in general.

To neglect the importance of maize among virtually any sedentary Mesoamerican aboriginal culture would constitute a grave omission; the neglect of other crops and supplementary proteins possibly utilized by the Classic Maya has been largely a matter of course, especially as it pertains to the collapse. Recognition of agricultural diversity among the Maya has deep roots in the early ethnographic accounts. Fray Diego de Landa

described a variety of native edibles raised by or accessible to Yucatecos:

> They have a fruit which is wonderfully fresh and of good taste, which is planted and the root which grows like a turnip short and thick and the fruit is round. They are eaten with salt. The other root which grows below the earth by planting it is a great means of sustenance and is of many different kinds, for there are mulberry colored, yellow and white varieties. They are eaten boiled and roasted and are good eating and resemble chestnuts somewhat and, roasted, are good for beverages. There are two other kinds of good roots and (they) form the sustenance of the Indians. There are two other wild roots, which when salted somewhat resemble the first one I spoke of and they help along the Indians in time of need and famine.[1]

Alfred M. Tozzer, whose copious notes to de Landa constitute a major contribution to Maya history and ethnography, identifies the first root as jicama, the second variously-colored "root" as non-verifiable, though perhaps the peanut, the next two as camote (sweet potato) and cassava, and the two wild roots possibly those know as cup and batun.[2] A later eyewitness account of Crescencia Carillo y Ancona adds further depth to the examination of Maya subsistence as he viewed it in the nineteenth century, noting that in addition to the trade crop, cacao, and the useful cotton plant, the people of Yucatan raised "maíz,ají, frijoles de muchos géneros y colores, jicamas, camotes, yuca, plátanos ciruelas, mameyes, chico zapotes,

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1. Diego de Landa, Landa's Relación de las Cosas de Yucatán, ed. Alfred M. Tozzer, Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 18 (Cambridge, Mass.: Peabody Museum, 1941), p. 196.

2. Alfred M. Tozzer, Landa's Relación, p. 196, fn. 1053, 1054, 1055, 1056.

anonas, árboles de jicaras," and that they were hunters as well, for game was plentiful.[3] Of course, a number of crops which today are widely known, and a staple for some cultures, like the banana, did not figure in the Classic Maya diet, as it and others such as the yam and white potato were of post-Columbian introduction to the area.

Continued enumeration of common nutritional sources gleaned from ethnographic accounts and observations can serve little purpose here, though a further examination of some of those mentioned and their possible influence on the Maya of the Classic period may provide a more balanced picture of subsistence and its postulated relation to the collapse. The role of different crops has been variously interpreted in the formulation of theories regarding the emergence of sedentary cultures and civilizations as well as their demise. Ralph Linton, in 1940, was so willing to acknowledge the importance of the bean plant to the Maya as to theorize, following the now unacceptable concept of Morley's Old and New Empires, that the introduction of beans to the Maya area could have sufficed to cause the sudden flowering of the Old Empire.[4] Could it not be that, from the tremendous variety of nutritive sources

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3. Crescencio Carillo y Ancona, Los Mayas de Yucatán (Mérida: Editorial Yucatense "Club del Libro:, 1950), p. 115.

4. Ralph Linton, "Crops, Soils, and Culture in America,: in The Maya and their Neighbors, Clarence Hay et al (New York: Appleton-Century, 1940), p. 36.

available, varying combinations might supply adequate amounts of protein, carbohydrates, vitamins, and minerals to the Classic Maya, thus negating the agricultural theories so strongly advocated? Until recently, points out William T. Sanders, no one seriously "suggested that the Maya may have depended as much, possibly even more, on such root crops as manioc and sweet potatoes" as on corn, until Bennet Bronson provided an insightful look at the possibility in "Roots and the Subsistence of the Ancient Maya" in 1966.[5] Bronson, one of many who lent his energies to the Tikal Project, the most ambitious long term undertaking in the Maya area, stated in no uncertain terms: "The possibility should be considered that roots had a subsistence reality in the Maya economy equal to that of corn."[6] This certainly cut against the grain of the accepted premise that corn always had been and probably always would be the major staple. The "assumption that staple foods do not change", he warns, "must be cautiously treated."[7]

Garnering the weight of evidence from observations, information from the Conquest period, and lexical and botanical data, he concentrated his discussion on the root crops he considered most likely to have served the Maya--the sweet potato,

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5. William T. Sanders, "The Cultural Ecology of the Lowland Maya: A Reevaluation,: in The Classic Maya Collapse, ed. T. Patrick Culbert (Albuquerque: University of New Mexico Press, 1973), p. 339.

6. Bennet Bronson, "Roots and the Subsistence of the Ancient Maya," Southwestern Journal of Anthropology, vol. 22, no. 3 (1966), p. 256.

7. Ibid, p. 257.

manioc (also known as cassava and yuca), and jicama. Noting a "pan-Maya distribution" of the sweet potato, and the extensive use of manioc by the Chorti, who "grow yuca in special milpas" he compared the caloric value with that of maize, and found them, gram for gram, almost the same.[8] Yet root crops had definite advantages over corn in some important respects:

> Centralized states with sizeable populations commonly try to maintain reserves of stored food, for use as a hedge against famine and as a provision for essential state-supported activities, including war. For a political unit in the warm, moist lowlands, food storage may well be crucial and extremely difficult. Dried corn is reasonably satisfactory in keeping qualities, although markedly inferior to dried manioc. Its real disadvantage is in the seasonal character of its growth: corn must all be planted at the same time of year, producing an annual feast-and-famine cycle. Manioc can be planted at almost any time, and can be harvested when it is needed, for it is capable of remaining in the ground for more than two years. Manioc, yautia, and the sweet potato are grown from cuttings. There is no danger that next year's crop will spoil in storage before planting.[9]

Bronson concluded by noting that the ideal situation would be one of a mixed subsistence economy, in which maize were available with its proteins, which are greatly lacking in root crops.[10]

A brief glance at botanical works supports Bronson's contentions in large measure:

> Manioc is a lowland tropical crop, although sometimes it is grown at elevations as high as 6000 feet. It will grow in somewhat arid regions as well as in regions with fairly high rainfall. Stem cuttings are used for propagation, and are simply stuck in the ground at an angle in fields prepared by slashing and

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8. Ibid, pp. 28, 259, 268.
9. Ibid, p. 271
10. Ibid.

> burning. The plants are then more-or-less left to themselves. Some varieties mature their roots in as little as six or seven months, and in others roots may continue to increase in size for up to four years. The roots are harvested as needed at the farmer's convenience. The plants are extremely productive. The plant also grows better on poor soil than any other major food plant.[11]

In terms of labor, minimal effort would be required, and in some cases, it was unnecessary to plant:

> The roots could be dug as needed at any time of year. No provision for storage was needed. Most significantly, digging is in effect involuntary cultivation. It loosens the soil, giving better aeration and more room for new tubers to grow. Harvest by digging stick is incomplete, pieces of the root stock being missed or rejected. These in turn become new plants. Repeated digging of a patch thus is a means to increase the number of such plants. Continued use tended to maintain, even to increase the productivity of such digging grounds.[12]

One can easily see that utilization of various root crops might have had quite beneficial results for the Classic Maya in terms of: 1) minimal labor expenditure, 2) perennial growth, 3) productivity even in poor soils, 4) high value in terms of carbohydrates, though admittedly lacking in protein, and 5) ease of storage. To many, the world of the twentieth century seems far removed from the grave problems of food preservation, and modern concepts may have obscured such a basic problem from the eyes of many archaeologists. Ruben Reina noted that

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11. Charles B. Heiser, Jr., Seed to Civilization: The Story of Man's Food (San Francisco: W. H. Freeman and Company, 1973), p. 147.

12. Carl O. Sauer, Seeds, Spades, Hearths and Herds: The Domestication of Animals and Foodstuffs, 2nd ed. (Cambridge, Mass.: Massachusetts Institute of Technology Press, 1969), p. 137.

in the contemporary Petén, Guatemala, "The storage of maize in this tropical climate constitutes a great problem for the milpero."[13] The well regarded journal Tropical Agriculture has dealt with virtually every agricultural problem known to the tropics, but as noted by P. H. Giles, even in modern times "The most immediate method of increasing the world's food supply is not by increased production but by reducing losses."[14]

Applying these observations to the past, we can see that the tuber may well have served as important a function as that postulated by Bronson. Dennis H. Puleston, another member of the Tikal Project, undertook research into the nature of chultuns which at first took him down parallel avenues. The chultun is an underground chamber cut into the limestone and is found in northern Yucatán and the southern lowlands as well; however, its use in each area probably differed, and the common designation applied to them in distinct areas led to the assumption, even by Morley, that their use was the same, in spite of differences in design, construction, and location within a building complex.[15] What was their purpose? "Among the possibilities which have previously been suggested as to their function are

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13. Rubén E. Reina, "Milpas and Milperos: Implications for Prehistoric Times," American Anthropologist, vol. 69, no. 1 (1967), p. 16.

14. P. H. Giles, "The Storage of Cereals by Farmers in Northern Nigeria," Tropical Agriculture, vol. 41, no. 3, (1964), p. 197.

15. Sylvanus Griswold Morley, The Ancient Maya, 3rd ed. rev. George W. Brainerd (Stanford: Stanford University Press, 1956), pp. 89, 264-265.

water cisterns, burial chambers, sweat baths, food cellars or religious shrines."[16] Puleston observed their locations at Tikal carefully: "The association of chultuns with modest dwellings lends weight to any hypothesis which suggests some domestic function."[17] There was little doubt at Tikal that the location of chultuns on higher ground, and the porous nature of the rock in which they were dug that their use was not for water storage, as proposed by many. The other most likely function was for food storage:

> If it could be shown that the use of chultuns as root cellars is more likely than their use as corn cribs, the suggestion that the Maya might have depended more heavily on root crops than is generally suspected takes on a new significance.[18]

Pursuing his research in subsequent field seasons at Tikal, Puleston would alter dramatically his assessment regarding the use of chultuns as root cellars. Puleston's reconstruction of Maya prehistory, formulated jointly with his wife Olga, found their civilization emerging in a riverine environment, where land was fertile, water was always available, and "an abundant supply of animal protein in the form of fish, turtles, and molluscs" was incorporated into the diet.[19] Then "Sometime

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16. George F. Andrews, Edzná, Campeche, Mexico, Settlement Patterns and Monumental Architecture (Eugene, Oregon: University of Oregon Press, 1969), p. 59.

17. Dennis E. Puleston, "The Chultuns of Tikal," Expedition, vol. 7, no. 3 (1965), p. 26.

18. Ibid, p. 29.

19. Dennis E. Puleston and Olga S. Puleston, "An Ecological Approach to the Origins of Maya Civilization," Archaeology, vo. 24, no. 4 (1971), p. 333.

before the end of the seventh century B.C. certain groups began utilizing another set of alternatives that allowed them to move away from the rivers into the interior."[20] Scarcity of water in the interior was remedied by the construction of reservoirs, "which permitted the storage of millions of gallons of water."[21] To compensate for the lost animal protein and the level of maize productivity allowed by fertile riverine soils, the Maya turned to the ramón tree, "which produces a dense carbohydrate seed in truly staggering quantities. Wild stands of the tree can produce a minimum of 1000 lbs/acre/year. The potential yield from tended orchard gardens may be two or three times that figure."[22] In addition, "the ramón seed contains slightly more protein than maize, with considerably greater quantities of certain essential amino acids."[23] Cyrus Lundell earlier voiced his belief in the importance of the ramón, and adds an essential point,

> that the fruit of this tree ripens during the dry season, March through May, thus affording the people food during the period when they probably needed it most, for as at the present time, the corn supply may often have been low or exhausted at that time.[24]

The successful adaptation of the Maya to an inland environment, then, according to the Pulestons, depended upon the ramón tree

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20. Ibid, p. 335. 21. Ibid. 22. Ibid, p. 336.

23. Ibid.

24. Cyrus L. Lundell, "The Agriculture of the Maya," Southwest Review, vol. 19 (1934), p. 72.

(long noted by archaeologists as a curious familiar sight at Maya ruins), continued use of maize, though as "a secondary crop relegated to outlying areas", and a reliance on inland game resources for supplementary protein.[25]

Seizing an opportunity to develop an important new theme in Maya subsistence studies, Dennis Puleston embarked on an innovative experiment--to fashion a chultun with stone tools--and upon its completion it was stocked with "an assortment of vegetables including maize, beans, squash, yuca or cassava, camote or sweet potato, macal, and potatoes", noting that potatoes were used "only for comparative purposes."[26] After eleven weeks, the corn, shelled and on the cob, had decomposed, the beans were attacked by mites and fungi, as was the squash, and the root crops, though edible, suffered weight loss and decay. Then, following the "discovery" of the ramón nut's nutritional value, it was included in another experiment with the same crops previously stored in the chultun. After nine weeks, the vegetables showed the same susceptibliity to decomposition and infestation, while the ramón seed "gave every appearance of being as fresh as when it had been put in."[27] Finally, "after 13 mo of underground storage, they were still in excellent condition and completely edible though the wicker

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25. Puleston and Puleston, "Origins of Maya Civilization," p. 336.

26. Dennis E. Puleston, "An Experimental Approach to the Function of Maya Chultuns," American Antiquity, vol. 36, no. 3, (1971), p. 328.

27. Ibid, p. 331.

baskets they had been placed in were reduced to a brown debris."[28]

Puleston's experimentation has proven nothing, but it has suggested much, and is certainly of greater value than the continued vain speculation into the use of chultuns. Their function has remained a mystery, because the modern Maya no longer use anything resembling a chultun for food storage, so there is no ethnographic data to support such use. However, if the Classic Maya did rely upon the ramón seed as a major source of protein, and if the seeds were stored in chultuns though neither is in evidence today, that does nothing to weaken Puleston's thesis; rather, it is in accordance with Bronson's warning not to assume that staple foods do not change. Rubén Reina noted the use of the ramón seed in the Peten in historic times, when the Maya "faced periods of near starvation, times when only the Ramon seed, obtained from a jungle tree, was available for tortilla making--a poor substitute from their point of view."[29] Sanders, too, while crediting Puleston for his work, noted that there is "such a thing as food preferences, and peasants have very definite preferences. Ramon nuts today are considered an emergency food and a poor substitute for maize, and maize was very probably the preferred food in Classic times."[30]

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28. Ibid, p. 332. 29. Reina, "Milpas and Milperos," p. 17.
30. Sanders, "Cultural Ecology," p. 341.

Given the centuries and advances which separate the modern world from that of the Classic Maya, it may be easier for modern man to dwell upon such contemporary luxuries as "food preferences"; it seems quite likely that the Classic Maya would prefer to maintain their lives and civilization, even if it meant a reliance on what their descendants consider an inferior source of nutrition. Further, the introduction of domestic animals such as cattle, chickens, and pigs has given the contemporary Maya more of a reason and alternative to reject the ramón seed as a part of their traditional diet.

While the work of Puleston presented new problems for those concerned with Maya subsistence studies, one must be aware, as Sanders warns, of "the extreme position he takes. He believes that most of the caloric intake of the Tikal Maya was derived from the ramon nut and that maize was of slight significance."[31] This is a valid but perhaps overstated reservation. Nonetheless, Puleston did acknowledge the diversity of nutritive sources available to the Maya to a greater degree than many Mayanists. One might remark at this point that Puleston's study of chultuns in no way undercuts the validity of Bennet Bronson's suggestions regarding the importance of root crops to the Classic Maya, as it is sufficiently clear that if tubers do not preserve well in chultuns, their storage in the ground over a period of time is well documented.

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31. Ibid.

If Dennis Puleston's study of chultuns and their relation to Maya subsistence are accepted, one must remember that the cultivation of ramón orchards "was apparently a northeastern Petén phenomenon and seems to have been lacking in the more peripheral areas."[32] Therefore, if the ramón tree staved off collapse in the southern lowlands, it would have had no such effect in the northern lowlands of Yucatán. It is in the Yucatán Peninsula that we find more data relating chultuns to a subsistence problem of an entirely different nature.

The following statement may seem absurd in its simplicity, but sometimes the obvious bears inspection: no form of animal life can survive without an adequate supply of water, for consumption or for the plant life it sustains. A tropical environment is no guarantee of a consistent amount of rainfall. As one surveys the scrub-forest-covered landscape of Yucatán, devoid of flowing rivers or streams, the absurdity of an obvious statement is lessened. Diego de Landa marvelled at the water sources in the land of Yucatán in the absence of surface water:

> Nature worked so differently in this country in the matter of rivers and springs, which in the rest of the world run on top of the land, that here in this country all run and flow through secret passages under it. On land God provided openings in the rock, which the Indians call cenotes, which reach down to the water through the cut in the living rock.[33]

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32. Ibid.

33. Landa, Landa's Relación, p. 187.

These cenotes, "circular sink holes formed by the collpase of underground caves," exposed precious underground water and made it accessible, providing the major source of water to the Maya.[34] The overly romanticized cenote cult of Chichén Itzá, into which it was once believed virgins were thrown from the ground level to the surface of the water, far below, was dedicated to the chacs, or rain gods of the Maya. Though underwater investigations and examination of skeletal remains have shown the sacrifice of virgins a distortion, the victims, often children, were expected to communicate with the chacs, who lived far beneath the water, and implore them to send sufficient rainfall to insure continued existence to the people. Other rites dedicated to the chacs during such ceremonies included the burning of various substances such as tobacco and copal, which formed clouds of dark smoke, which would aid the rain-making gods to create dark rain clouds.[35]

Edward H. Thompson observed the scarcity of water in the peninsula, and found it more than curious that the ancient ruins of Labná were not located in the proximity of a cenote:

> One of the singular facts about Labná was that it seemed to have depended entirely upon the rainfall for its water supply. Every large edifice within this ancient city had at least one reservoir or cistern called by the Mayas chultunes, built into

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34. Michael D. Coe, The Maya (New York: Praeger Publishers, 1966, p. 23.

35. J. Eric S. Thompson, Maya History and Religion (Norman: Univeristy of Oklahoma Press, 1970), pp. 180, 113.

> the structure of the terrace on which the edifice rested.[36]

By his own count, Thompson had explored well over 100 of these underground chambers in Yucatán, and considered them important to the very survival of the Maya, for if they were not solely "intended to receive and hold the rain water during the rainy season" their alternative use was storage of food.[37] The careful consul climbed into many of them, and found other ancient materials (as well as a living rattlesnake which he met eye to eye while lowering himself into one chultun), which might have indicated alternative functions for the chultuns, but his reasoning led him to place more credence in their use as reservoirs. Unlike the porous nature of the Petén chultuns, which were carved into the rock, those in Yucatan had "walls made of stone and mortar rubble, faced with cut stone and surfaced with a hard finish of mortar."[38] Such construction, with their location on terraces where they would catch water pointed to a need to conserve the precious liquid resource.

Dennis Puleston, the advocate of archaeological experimentation, noted that chultuns indeed could be used effectively for the storage of water, as one "at Uxmal was used to sustain

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36. Edward H. Thompson, People of the Serpent, Life and Adventure Among the Mayas (New York: Capricorn Books, 1965), p. 62.

37. Edward H. Thompson, "Ruins of Xkichmóok, Yucatán," Field Museum Publication, no. 28, Anthropological Series 2, no. 3, p. 225.

38. Edward Thompson, People of the Serpent, p. 63.

(Frans) Blom's field crew at the site in 1930."[39] That experiment proved of great value to the inhabitants of the region, as "Since that time other chultuns have been restored with their circular catchment-basins, and are currently in use at Kabáh, Sayil, and possibly other sites, as well as Uxmal."[40]

Yet there were other means of water conservation observed in Yucatán, first by Diego de Landa, who described the need of the Indians "to make hollows in the rocks in the rainy season in order to collect the rain water in them to supply the households."[41] As Tozzer explains,

> These hollows or water-holes, usually called aguadas in Spanish, are both natural and artificial. Starting with a natural depression, they were often enlarged, deepened and, in some cases, paved with stone or cement.[42]

John Lloyd Stephens, who travelled through the Puuc region of Yucatán in 1841, also noted the problem of water storage and described the use of sartenajas, another term for aguadas, which collected "deposits of rain-water in the holes and hollows of rocks."[43] Years later Consul Edward Thompson, commenting on the continued use of such means of conservation, noted the "large pot-holes in the hillside ledges called sartenjas (which)

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39. Puleston, "Function of Maya Chultuns," p. 324.

40. Ibid.

41. Landa, Landa's Relación, p. 188.

42. Tozzer, Landa's Relación, p. 188, fn. 984.

43. John Lloyd Stephens, Incidents of Travel in Yucatan, 2 vols. (New York: Harper and Brothers, 1843), 2:13.

probably supplied the wants of a portion, while hollow trees fire-hewn into water reservoirs may have served likewise."[44]

The varied means of conserving water, from the sophisticated water-holding chultun to the more primitive hollowed tree indicate a long term problem of supply to maintian life at a subsistence level, and the greater water demand of a large population which existed in the Classic period could have severely depleted the accessible reserves. It is certainly within the bounds of reason that a cycle of drought could have caused the dispersal of residents of Maya population centers into smaller groups at nearby areas, though not so near as to allow the continued life under the auspices of the highly structured social organization known in Classic times.

If the use of chultuns for water storage was common only to the Yucatec Maya, the problem of water shortages was one of supreme importance throughout the lowlands. In the Petén, "in the immediate environs of Tikal, there are no springs, permanent streams, or rivers, and rainfall, though moderately heavy, is quickly absorbed by the porous limestone bedrock."[45] How, then, did this twenty-five square mile residential and ceremonial center survive? Previously the existence of large

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44. Edward H. Thompson, "Ancient Structures of Yucatán Not Communal Dwellings," Proceedings of the American Antiquarian Society, n.s. 8 (1892), p. 269.

45. Edwin M. Shook, "Archaeological Investigations in Tikal, Petén, Guatemala," XXXV Congreso Internacional de Americanistas (México, D.F.: Congress of Americanists, 1964), p. 379.

reservoirs at Tikal has been noted, reservoirs which could supply the needs of the city.[46] These aguadas

> are generally circular basins about 50 to 100 m. in diameter dug into the clay soil of swampy places, the excavated earth being piled in a dam-like embankment around the room. They impound rainwater and in some instances run-off from adacent (sic) slopes."[47]

Indications of water shortages are many, but evidences of such remain slight. However, Rubén Reina brought to light some information from the recesses of the Archives of the Indies in Seville which seems to indicate fluctuations in the water level in the southern lowlands of the Petén in historic times. There have been some questions regarding the identification of islands in Lake Petén-Itzá, which Hernán Cortés passed during his journey to Honduras in 1525. Reina believes that what is today the Tayasal Peninsula, just across from the island city Flores, was once an island, but due to a drop in the level of the water, more ground was exposed, thus linking it with the mainland. In support of his contention are two maps he discovered, one with an approximate date of 1730, and the other dated 1785, which both show the Tayasal peninsula as it once might have been--an island.[48]

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46. Puleston and Puleston, "Origins of Maya Civilization," p. 335.

47. William R. Bullard, Jr., "Maya Settlement Patterns in Northeastern Petén, Guatemala," American Antiquity, vol. 25, no. 3 (1960), p. 363.

48. Rubén Reina, "A Peninsula that May Once Have Been an Island: Tayasal, Petén, Guatemala," Expedition, vol. 9, no. 1 (1966), p. 26.

Applying the documentation of the maps and their support of change to the Classic Maya he mused,

> It is interesting to speculate on the effects of fluctuation of water level, particularly on food supply. If the water in this general region of Peten was about 50 feet higher, the bajos in Tikal would have been a substantial body of water and perhaps naturally linked to the general water systems of the large rivers, particularly in the rainy season.[49]

Then during the dry season, as the water level receded, the reservoirs of Tikal would be cut off from the rivers, and fish would be trapped in the bajos, leaving an added source of nutrition. However, if "the water level of lakes and rivers subsided for a prolonged period, an important source of food disappeared and could have caused a disruption of life in a highly urbanized Maya center."[50]

Oliver Ricketson, however, preferred to believe that no such change in seasonal rains took place. Instead his theory "accepts Maya civilization as having developed on the peninsula of Yucatán under physical conditions and climate generally similar to those now existing and calls for no far-fetched postulates."[51] Ricketson relied upon the examination of Petén bajos by C. Wythe Cooke, a member of the United States Geological Survey. Cooke observed that silt from the gently southerly

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49. Ibid, p. 29.

50. Ibid.

51. Oliver G. Ricketson and Edith B. Ricketson, Uaxactún, Guatemala, Group E--1926-1937, Carnegie Institution of Washington Publication, no. 477 (Washington, D.C.: Carnegie Institution, 1937), p. 11.

sloping terrain of the Petén was washed into what once were shallow lakes, thus denuding the surrounding agricultural region of its already thin layer of top soil, and turning what was once almost an interconnecting system of lakes in the Petén into swampy depressions. "It is quite possible," theorized Cook,

> that the transition from lake to bajo may have occurred during the time of the Mayan Empire, when much of the uplands must have been under cultivation. The rate of erosion must have been enormously accelerated when the forest was cut and the cultivated soil was exposed to the full force of the torrential rains.[52]

Cooke saw erosion, with rain as the destructive agent, as a natural cause of collapse in relation to agriculture, regardless of what system was employed. At the same time, the sources of water were depleted with each successive rainy season. Ricketson, though he envisioned a decline in healthful conditions due to an increase of mosquitoes in the swampy bajos, placed far more emphasis on the erosion problem. This is because, unlike most Mayanists of the 1930's, he believed the Maya practiced intensive, rather than extensive agriculture like the swidden system, and, like those in the mainstream, felt that slash and burn agriculture "would never have supported the ancient Maya population at its peak. Consequently, soil exhaustion can not be traced to the milpa (swidden) system."[53]

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52. C. Wythe Cooke, "Why the Mayan Cities of the Peten District, Guatemala, were Abandoned," Journal of the Washington Academy of Sciences, vol. 21, no. 13, in Ricketson and Ricketson, Uaxactún, pp. 10-11.

53. Ricketson and Ricketson, Uaxactún, p. 12.

The potential of agriculture under the swidden system has been discussed previously, and need not be repeated here so long as one recalls the more recent studies have shown technology more productive than believed at the time of Ricketson's publication. It should be pointed out, however, that Ricketson's evidences of intensive cultivation through the use of agricultural terracing were found in areas external to the Petén, and therefore cannot be accepted as general practices.

Ricketson's theory of erosion by rain brings us to a middle ground in the examination of subsistence problems in relation to water as a primary force. To those who believed a prolonged period of dryness drastically affected the Maya, as evidenced by the use of chultuns and sartenjas in northern Yucatán and of reservoirs in the Petén, and to those who believed environmental conditions in Classic times were much as they are today, should be added Ellsworth Huntington, who postulated that an environmental cycle climaxing with a tremendous increase in rainfall rendered the land of the Maya unsuitable for a large population.

Sylvanus Morley, writing in 1920, considered Huntington's theory "the best known hypothesis seeking to explain the extinction of the Old Empire civilization."[54] In a series

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54. Sylvanus Griswold Morley, The Inscriptions of Copán, Carnegie Institution of Washington Publication, no. 219 (Washington, D.C.: Carnegie Institution, 1920), p. 448.

of works Huntington developed his theme of environmental determinism, making the "apparent connection between climate and history."[55] Since, as he believed, the Maya developed a civilization in the "lowlands where agriculture is practically impossible" the "anomalies of the Maya situation"-- that a great civilization grew under such adverse conditions--could be explained by a "climatic change such that the dry conditions which prevail a little farther north prevailed in the Maya region when these people attained eminence."[56] A lesser amount of rainfall he considered

> a distinct advantage, because it prevents the growth of the great tropical forest which so effectively checks human progress. If the rainfall of the past had been greater than that of the present, the effect would have been to diminish rather than increase the density of population.[57]

Such a postulated diminution of population Huntington ascribed to a combination of unhealthful conditions and an agricultural crisis. The Maya slash and burn technology became ineffective. During a prolonged period of increased precipitation, the dry season "was probably so short that the bushes could not be burned."[58] Without sufficient time to dry, the

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55. Ellsworth Huntington, Civilization and Climate (New Haven: Yale University Press, 1915), p. 6.

56. Ibid, pp. 241, 242.

57. Ellsworth Huntington, The Climatic Factor, As Illustrated in Arid America, Carnegie Institution of Washington Publication, no. 192 (Washington, D.C.: Carnegie Institution, 1914), p. 190.

58. Ellsworth Huntington, "Maya Civilization and Climatic Changes," Proceedings of the XIX International Congress of Americanists (Washington, D.C.: Congress of Americanists, 1917), p. 160.

felled trees remained in piles, and crops could not be planted, leading to a wholesale agricultural disaster coupled with the aforementioned deterioration of a once healthful climate.

What is especially curious is Huntington's correlation of epochs of Maya history, according to Morley's chronology, with his proposed cycles of increased and decreased precipitation. These cycles were documented in the North by observing the variations in the width of California Sequoia tree rings in trees ranging in age from 250 to 3250 years. The years of drought revealed barely perceptible growth, while years of heavy precipitation produced a much wider annual ring. Even J. Eric Thompson and Thomas Gann commented briefly on the "curious coincidence between Huntingdon's (sic) alternating favorable and unfavorable climatic conditions, and the periods of progress and retrogression in the Maya civilization."[59] Indeed Huntington's graph of climatic change in California from 100 B.C. to 1800 A.D. lends remarkable circumstantial support to his thesis when compared to his table of Maya history of the same period.[60] Most notable is that period of extreme scarcity of dated monuments in the latter half of the

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59. Ibid, p. 158; Thomas W. F. Gann and J. Eric S. Thompson, The History of the Maya (New York: Charles Scribner's Sons, 1937), pp. 64-65.

60. Huntington, The Climatic Factor, p. 231.

sixth century, which coincided with the inferred period of unsuitable living/agricultural conditions due to prolonged heavy precipitation. That a definite period of relative inactivity occurred at the close of the sixth century, insofar as archaeological investigations have revealed, was established early by Morley. He considered it the close of the so-called Old Empire. Gordon Willey recently re-examined this hiatus; both he and Morley ascribed the discontinuity to causes other than Huntington's proposed climatic changes.[61]

One might say regarding Huntington's theory that it represents an early attempt by those outside the archaeological discipline to lend their expertise to the interpretation of prehistory. Nonetheless, however curious the coincidences between the cycles of rainfall in California and the course of Maya history, there remains one serious drawback: there is simply no corollary evidence that the Maya area experienced climatic conditions comparable to those which are documented for California.[62]

That a great diversity of opinion exists regarding problems of Classic Maya subsistence is readily apparent. Not only is it apparent, but it is perhaps incredible to note the

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61. Sylvanus Griswold Morley, An Introduction to the Study of Maya Hieroglyphs (New York: Dover Publishers, Inc., 1975), pp. 2-3. Gordon R. Willey, :The Classic Maya Hiatus: a 'rehearsal' for the collapse?," in Mesoamerican Archaeology: New Approaches, ed. Norman Hammond (Austin: University of Texas Press, 1974), pp. 317-430.

62. Morley, Inscriptions of Copán, p. 452.

extreme polarity of opinions, supported by varying weights of evidence, proven and circumstantial, dealing with the same basic problem. Of all observations from which inferences are drawn, coupled with plainly stated themes of collapse, more literature is found concerned with Maya agriculture and subsistence than any other proposed cause of collapse with the exception of invasion. Cognizance of the often irreconcilable theories dealing with subsistence is perhaps instructive in grasping the elusive nature of the over-all problem. Though some theories and inferences must fall in the "unlikely" category, there remain a variety of other viable proposals. To state authoritatively which of those should be considered and which discarded is a judgment none but the most self-assured could make.

CHAPTER V

VIOLENCE AND THE CLASSIC MAYA COLLAPSE

The theories of collapse analyzed in the previous chapters all relate to ecological failures. The three to be considered herein are socio-political theories. Two of them--J. Eric Thompson's theory of a peasant revolt against an increasingly distant and indifferent authority and the theory of inter-city warfare--hold the collapse to be the result of pressures internal to the Maya world. The third maintains that an outright invasion by other aboriginal peoples caused the depopulation and abandonment of Maya centers. A concurrent treatment is necessitated by the nature of available evidence, since "signs of internal social revolt are very hard to detect, and all evidence adduced to support such an interpretation could be alternatively construed."[1] How, for instance, could one hope to prove with certainty that the desecration of stele bearing portraits of historical personages was the handiwork of Maya peasants who could no longer acquiesce in the increasing demands of a civil-religious hierarchy, when the same physical evidence as strongly supports the belief

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1. Richard E. W. Adams, "The Collapse of Maya Civilization: A Review of Previous Theories," in The Classic Maya Collapse, ed. T. Patrick Culbert (Albuquerque: University of New Mexico Press, 1973), p. 30

that it was the work of an invading foreign or Maya conqueror intent on removing a prominent symbol of the previous authority? Evidences of violence and militarism are noted at various sites in the late Classic period and will be examined briefly, but to interpolate the causes of such violence is a tenuous task, dependent as it is on both archaeological and ethnographic interpretation, thrust backward through time to a day when models of social organization modern scholars believe viable for the Classic period may or may not apply.

The possibility of invasion overturning the world of the Maya has much to recommend it, from the standpoint of comparative studies of other fallen civilizations as well as a multitude of evidences, of variable merit, from within the Maya area itself. Chichén Itzá, a center of major importance during the Classic period, in its Post-Classic setting presents Mayanists with a well documented model of occupation and subsequent control by an intrusive group, perhaps from Tula, in the Valley of Mexico, over 800 miles distant. This postulated invasion by the Toltec, from whom so many Mesoamerican peoples claimed descent, took place shortly after 889 or 909 A.D. It is evident in the remodeling of old buildings and construction of new ones in Toltec style.[2] We shall see subsequently, however, that the invaders may not have been Toltec, but a group

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2. J. Eric S. Thompson, The Rise and Fall of Maya Civilization, 2nd ed. (Norman: University of Oklahoma Press, 1966), p. 117.

of Mexicanized Maya. Nevertheless, if such distances were overcome in pursuit of conquest during the Post-Classic period, there is little logic to support those who might contend that vast distances and geographical barriers, crossed only by foot or dugout canoe, would prove an insurmountable obstacle to those of a slightly earlier time.

It has been noted earlier in this study that many of the nineteenth century travellers to and writers about the Maya region postulated a violent end to Maya civilization, among them the artist Jean Frederick Waldeck, B. M. Norman, and the eccentric Augustus LePlongeon. Yet there was little, if any evidence to substantiate their hypotheses until the pioneer of ethnohistorical studies, Charles Etienne Brasseur de Bourbourg, made a body of native literature available for study. Unfortunately, the publication of many of these sources was accompanied by his own interpretations, which were "often directed to proving fanciful and preconceived ideas."[3]

Believing that he could discern historical fact from the maze of contradictory information found in native traditions, Brasseur compiled his own version of aboriginal history in a fashion scarcely more coherent than the confusing nature of the native manuscripts. According to tradition there had

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3. Carroll Edward Mace, "Charles Etienne Brasseur de Bourbourg, 1814-1874," in Howard F. Cline, ed., Guide to Ethnohistorical Sources: Part Two, in Robert Wauchope, gen. ed., Handbook of Middle American Indians, 16 vols. (Austin, University of Texas Press, 1964-75), 13:298.

been several periods of Nahuatl migrations, the first movement from Chiapas to the North toward Central Mexico, and the later migrations to the South once again. He believed Palenque had been the original capital of the Quiché Maya empire. When the Nahuatl peoples migrated to the South, they settled within its boundaries, near Ocosingo, which Brasseur claimed was the legendary Tulhá (Tula). The recently arrived Nahuatl banded together with the oppressed subjects of the kingdom to provoke a "civil war" which broke the back of the Quiché empire: "The revolutions that followed in the city of Tulhá, carried in its wake the independence of all the provinces of the great empire of the Quichés, and the establishment of a large number of small kingdoms erected on its remains."[4]

Thus came the destruction of one classic period, which Brasseur dated toward the end of the fifth century A.D. But to Copán he assigned an entirely different epoch. He believed it was still inhabited in the twelfth century, although perhaps in a state of decline. It was then that "Barbarians from different regions left at the same time, invaded the ancient empire of the Quichés, exiled or annihilated its inhabitants, destroyed the cities . . . and changed into deserts the most populated places."[5]

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4. Charles Etienne Brasseur de Bourbourg, Cartas para servir de introducción a la história primitiva de las naciones civilizadas de la América setentrional (México: Imprenta de M. Murguía, 1851), p. 73.

5. Ibid, p. 74.

Brasseur, then, advanced two theories for the Maya collapse: internal strife and an invasion of barbarians, taking place in two epochs separated by centuries. His greatest difficulty at this time stemmed from assignment of a chronology of the events, but his later works were roundly condemned by virtually all but Augustus LePlongeon, as Brasseur's "final synthesis proclaimed that all Indian manuscripts described geological upheavals which had transformed the world"--not just the world of the Maya.[6] However, the publication of native manuscripts provided a wealth of primary sources which could be employed by other scholars, who judiciously ignored the increasingly imaginative interpretations of Brasseur.

Though suffering merited neglect by modern scholars, Brasseur's interpretive works were cited often in the latter part of the nineteenth century, as a number of general histories reveal. Some of these references to Brasseur were quite negative. John D. Baldwin, in a careful work, scoffed at many of Brasseur's formulations, and noted that in the absence of hard evidence "theorizing has very naturally been stimulated to great activity."[7] Daniel G. Brinton, another, but much more conservative ethnohistorical pioneer than Brasseur, was anxious to debunk what he considered the myth of Toltec existence. He censured any historical reconstruction

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6. Mace, "Brasseur de Bourbourg," p. 298.

7. John D. Baldwin, Ancient America, (New York: Harper and Brothers, 1875), p. 165.

that included Tula, calling it "the monstrous myth of the later priests and poets, which makes of it a birthplace and abode of the gods, and its inhabitants the semi-divine conquerors of Mexico and Central America. For this latter fable there is not a vestige of solid foundation."[8]

As time passed, Brasseur's original contributions proved unimportant, but the use of manuscripts became a major factor in the Maya research, and the historicity of aboriginal migrations was widely accepted, though they lacked a definite chronology. The application of material relating a series of aboriginal migrations to the Maya collapse, however, suffered in the absence of definite supporting evidence linking migrant peoples to a violent end of the Maya Classic period, a modern designation which, at the turn of the century had yet to be ascertained. Even so, it became apparent to many that the course of Maya civilization could not have remained unaffected by alien influences.

Toward the close of the nineteenth century, an important phase in the history of Maya archaeology began, which was to provide data in support of a violent end to the Classic Maya. Funds from various sources allowed for the collection of a greater number of objects for research. The pioneering efforts of Alfred Percival Maudslay in collecting evidence for scholarly

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8. Daniel G. Brinton, "Were the Toltecs an historic nationality?" Proceedings of the American Philosophical Society, XXIII (1887), 236.

study have been widely acclaimed.[9] Beginning in the 1880's this English gentleman made accurate drawings of stele, but more importantly, labored to provide plaster castings of many Maya artistic features for use by others.[10] Exact duplicates in plaster allowed for no imaginative reconstructions like those earlier drawings unveiled by Jean Frederick Waldeck.

Imagination is a useful tool for the reconstruction of the archaeological past, but it must be tempered with logic while employing whatever evidence is available. United States Consul Edward H. Thompson was especially adept at this, but carefully noted that he offered his ideas with the hope of furthering knowledge and research--not for the sake of his ego. Thompson, too, had suggestions that implied a violent end to the Maya "Empire." Like anyone visiting the ancient monuments of the Maya, Thompson was struck by their sheer magnificence of proportion. He agreed with B. M. Norman that the massive palaces and temples were erected by slaves "to produce the conditions looking to the superlative in comfort and luxury."[11] The result was "a successful effort of a

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9. Sylvanus Griswold Morley, The Ancient Maya, 3rd ed. rev. George Brainerd (Stanford: Stanford University Press, 1956), p. vii; Thomas A. Joyce, Mexican Archaeology (New York: G. P. Putnam's Sons, 1914), p. vii.

10. Alfred Percival Maudslay, Archaeology, Biologia Centrali-Americana, 5 vols. (London: Porter and Dulau, 1889-1902), 1:3.

11. Edward H. Thompson, "The Genesis of the Maya Arch," American Anthropologist, vol. 13, (1911), p. 502.

slave-holding people to be as comfortable as they could be regardless of cost, life or labor cost."[12] Though he expanded no further, the inference had been made--that successful completion of certain material goals took precedence over the wellbeing of a lower class of inhabitants, a class which must have been, according to his statements, of substantial size. Circumstantial as the "evidence" may have been, the idea of internal social decay was again planted and expanded in the growing volume of Mayanist literature.

Thompson also wished to clarify what had previously, and understandably, been the muddled role of migrating Nahuatl and their relation to the Maya. Initially he stressed the cultural unity of a people called the Chanes, who, centuries ago, arrived in ships at the mouth of the Pánuco River in present day Tampico. As time passed, migrations, to the North and South, began from that region. These peoples, of a common background, now separated geographically and by the passage of years, became known as tultecas in the North, while their relatives to the South were known as ulmecas.[13] An inderterminate time later

> a roving band of the Tultecas, lost brothers of the Ulmecas . . . turned southward and went first to the ancient parting place of the two groups of chanes. Through the slow growing centuries they had become near kin in manners, thoughts, and language to the

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12. Ibid.

13. Edward H. Thompson, People of the Serpent, Life and Adventure Among the Maya (New York: Capricorn Books, 1965), pp. 77-79.

> people they had neighbored in the north. They drifted along the ancient trail of the Ulmecas, down to the capital of the Ulmeca mayas, Chichen Itza. This was the so-called Toltec invasion, which occurred but a few centuries before the coming of the Spaniards.[14]

At this point one is not certain whether the Mayaphile Thompson considered the "Reunion" of the two groups a peaceful source of inspiration resulting in the "Toltec" phase of Chichén Itzá, or a "renaissance," as it has so often been termed, imposed by conquest. He had earlier elaborated on the possibilities of conquest in a letter to his friend William H. Holmes, in conjunction with his discovery of seven graves within enclosed structures at Chichén Itzá: "The stones which formed the graves were for the most part worked stones that had at one time formed a part of the structure."[15] This evidence

> together with the finding of the broken and mutilated stone figure or idol--portions in different places within the line of work--at first thought seem to point to the fact that the graves were those of a people buried within the ruins of a conquered city whose ruined structures served as monuments above them; whose dethroned and mutilated sacred images were thrown in as trophies and votive offerings, together with the valued objects of peace and friendship, upon the graves of the deceased victors.[16]

From examination of another grave nearby the consul wrote:

> I could seem to trace the hand of a wanton destroyer, breaking the sacred vessels of a conquered enemy

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14. Ibid, p. 79

15. Edward H. Thompson, "The High Priest's Grave, Chichén Itzá, Yucatán, Mexico," Field Museum of Natural History, Anthropological Series Publication, no. 412 (1938), 36.

16. Ibid.

> prior to razing his temple. There were many pieces, some of large size, whose positions, when found, in relation to others of the same vessel were such as could only have been brought about by strong lateral blows.[17]

Thompson took great pains to explain indications of violent disruption in Yucatán to William Holmes, as the distinguished antiquarian had made a whirlwind visit through portions of the Maya area with the consul, and had been convinced that "on the whole the Mayas must, during the period of greatest prosperity, have been a peaceable people" since there was "little or no indication of the selection of particularly defensible sites and few walls that resemble fortifications."[18] Holmes continued: "Comparative peace prevailed for a long period, but the rapid development of many centers of culture and power seem to have led to jealousies and feuds" which fragmented the civilization well before the advent of the Spaniards.[19]

Holmes relied on his cursory glimpse of Maya sites and on Yucatecan sources recounting the destruction of the Post-Classic League of Mayapan, which signalled the end of any semblance of unified cultural organization in the area. Thompson was aware of these sources, too, but his evidences of possible violent conquest were contained within ancient structures, temples having been erected over graves, thereby

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17. Ibid, p. 42.

18. William H. Holmes, Archaeological Studies among the Ancient Cities of Mexico, Field Columbian Museum, Anthropological Series, 2 pts. (New York: Field Museum, 1895-1897), 1:23.

19. Ibid, p. 19.

making a stronger case for an external conquest and subsequent revitalization at an earlier time, as opposed to Holmes' belief that internal strife brought the civilization to its end.

While Thompson conducted his investigations with the intent to cooperate with other researchers, another turn of the century Mayanist, Teobert Maler, considered all the ruins of the Maya area his private province.[20] This abrasive German born Austrian, in his twilight years may have, as Robert Brunhouse cautiously alleges, actually bribed Thompson's Maya workers at Chichén Itzá to "steal all the objects they could smuggle" obtained from the consul's dives into the Sacred Cenote.[21] Nevertheless, in earlier years this "lone wolf" explorer contributed an outstanding body of research to the Peabody Museum of Harvard--for a price, of course. His numerous excellent quality photographs captured many evidences of violence carved in limestone stele.

Maler was particularly impressed with the ruins of Piedras Negras, on the banks of the Usumacinta, where he described several stele bearing portraits of warrior chieftains and their captives.[22] He made special note of a lintel which

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20. Teobert Maler, Researches in the Central Portion of the Usumatsintla Valley: Report of Explorations for the Museum 1898-1900, Memoirs of the Peabody Museum of Archaeology and Ethnography, Harvard University, vol. 2 (Cambridge, Mass: Peabody Museum, 1901-09), 108.

21. Robert L. Brunhouse, In Search of the Maya (Albuquerque: University of New Mexico Press, 1973), p. 182.

22. Maler, The Usumatsintla Valley, pp. 30-31.

he interpreted as a monument commemorating the consecration of warriors, a strong indication of a militaristic current among the Maya.[23] But it was at Yaxchilán, which he dourly noted, Alfred P. Maudslay and Desire Charnay explored together in 1882, fifteen years earlier, that he voiced his comments on the militaristic makeup of the Maya.[24] Yaxchilán, like other sites along the Usumacinta, abounded in representations of warriors and bound captives. Unlike William Holmes, Maler considered the location and construction of buildings at Yaxchilán noteworthy indications of their defensive value. First, the Usumacinta afforded protection against a well organized attack from that flank,

> while from the platform of structure A 51 there is a very good view in the direction of the neighboring southwestern mountains. With the striving for architectural effects, strategical requirements were also taken into consideration in the plan of the city. Thus the lesser Acropolis formed for those times an impregnable citadel. I believe that the city, defended by inhabitants so well versed in the arts of war, was never conquered by an enemy during the long period of its existence.[25]

Whether or not one accepts Maler's assessment of the invincibility of the Maya of Yaxchilán, his comments and photographs reveal a preoccupation with the construction of defensive sites, and artistic renderings of warriors and captives, belying statements that the Maya were, in the words of Holmes, "a peaceable people."[26] Even so, the stele found by Maler were only indicators of violence, of victor and captive, and the

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23. Ibid, p. 31. 24. Ibid, p. 108. 25. Ibid, p. 192.

26. Holmes, Archaeological Studies, 1:23.

accompanying hieroglyphic inscriptions could not be deciphered to clarify their meaning.

The problem of glyphic interpretation hampers investigations to this day, although many have now been identified, but the first decades of the twentieth century found most in agreement with Herbert J. Spinden, whose major work, A Study of Maya Art, published in 1913 held that "all great monuments were apparently connected with religious practices."[27] He noted further that Maya art was "largely given over to the expression of barbarous concepts," a reference which no doubt includes numerous scenes of bound captives, apparent candidates for sacrifice.[28] He did describe some exceptions to religious motives, "which apparently memorialize success in war, and in these none of the usual religious paraphernalia appears."[29] A description of such an example from a Yaxchilán lintel follows:

> In the center is a chief with spear and shield and in full regalia. The head of a slain enemy hangs hair down from his breast, and cross bones decorate his dress. At the left is one of his assistants, likewise armed. Kneeling on the ground are four captives bound with rope. Upon the bodies of these captives are glyphs which may record their names and the date of their capture. At the upper part of the stone are two bands of glyphs which possibly contain the narrative of the victory or other information of historical interest.[30]

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27. Herbert J. Spinden, A Study of Maya Art, Its Subject Matter and Historical Development (New York: Dover Publications, Inc., 1975), p. 15

28. Ibid, p. 14 29. Ibid, p. 21. 30. Ibid, p. 23.

Here one must note, in the absence of an accompanying drawing or photograph, that the bound captives seem in all respects to be Maya, as they exhibit no alien traits which would connect them with an enemy from afar. This certainly implies for Maya political organization a series of autonomous city-states of variable power which occasionally or for sustained periods engaged in combat with each other. Spinden felt that "Undoubtedly some cities were more progressive than others of the same period" and that "Some were great centers of wealth lying in fruitful lands, while others were poor in resources and perhaps held in tribute."[31]

Thomas A. Joyce soon followed Spinden's study with a careful synthesis of what was known of Mexican archaeology in 1914. He detected no signs of violent destruction of Maya buildings, and remarked that

> The Maya, to judge from the monuments, had enjoyed centuries of peace, and only in the northeast and north do we find reliefs which give any hint of war. But these may be significant, and no doubt the decline of the old culture was due to pressure exercised by their northern neighbors, a pressure which had its origin in the steady southerly drift of tribes from regions considerably further north, and which led to the occupation of the Mexican valley by the Nahua-speaking Toltec.[32]

Like Edward Thompson, Joyce believed the Toltec to have been related to the Maya. They had left the Maya region to journey north and remain for centuries before the southerly advance of non-related northern tribes pushed them southward again.[33]

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31. Ibid, p. 165. 32. Joyce, Mexican Archaeology, pp. 364-65.

33. Ibid, pp. 365-66.

Morley, however, felt the scheme of Joyce too simplistic, for he ignored the nature of the problem. He maintained that the migrations of the Nahua

> always appear to have been along the Pacific Coastplain and never along the Atlantic side of the Continental Divide. There is no archaeological evidence that the two races ever came into contact, except possibly in Copán or the southeastern frontier and from Ocosingo northward in the extreme west.[34]

In addition, the terminal dates on the stele from Maya centers "indicate that they were not abandoned simultaneously" and that moving from Copán in the south and Palenque in the west, "the last cities to be abandoned" were in the northeastern and central Petén.[35] This would make Joyce's suggestion unfeasible, since the proposed conquest would have bypassed both areas, and taken place on the Pacific coastal plain, separated from the lowland areas by the Sierra Madre del Sur.

Morley did not accept the existence of foreign contacts with the Maya until the New Empire period at Chichén Itzá. His late writings contend:

> the character of the Maya area enforced a degree of isolation unusual among high civilizations. While the dense jungle of the central Maya area may not have been impassable, it must still have cut them off to a large extent from the outside contacts through which new ideas and inventions are diffused, and hindered the development of a large-scale trade which could have supplied resources lacking in the area.[36]

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34. Sylvanus Griswold Morley, The Inscriptions of Copán, Carnegie Institution of Washington Publication, no. 219 (Washington, D.C.: Carnegie Institution, 1920), p. 444.

35. Ibid. 36. Morley, The Ancient Maya, p. 426.

Morley's opinion to the contrary, it was early in the study of the Maya that George Byron Gordon stated:

> The two great cultures of antiquity that flourished (the Valley of Mexico and the Maya area) are related to each other in such a way that it is impossible to take a comprehensive survey of either without considering also the claims of the other.[37]

His recognition of the numerous common motives found in each area led him to believe firmly in the existence of "widespread commercial relations between the aboriginal Americans."[38]

If such was indeed the case, the identification of ties within and without the Maya region would severely undercut the validity of Morley's position on Maya isolation. Archaeologists then would be able to distinguish spheres of influence which might directly affect formulations postulating a violent end to Maya civilization. Ties with peoples external to the central Maya area could be examined and alien influences recognized, and perhaps be distinguished as peaceful or coercive. As it happens, recent archaeological investigations confirm the existence of widespread commercial networks throughout Mesoamerica, from Pre-Classic to Post-Classic times. According to J. Eric Thompson,

> Maya culture neither matured nor decayed in isolation; influences from outside the area surely affected the culture at all times starting with the undoubted relationships with outside the area in the Mamom period.

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37. George Byron Gordon, "The Serpent Motive in the Ancient Art of Central America and Mexico," Transactions of the Department of Archaeology Free Museum of Science and Art, University of Pennsylvania, vol. 1 (1905), 131.

38. Ibid.

> Representations of Tlaloc on dated monuments reveal how these Mexican deities managed to insinuate themselves into Maya life at a quite early date and continued to do so again and again in widely separated centers . . . Whether these representations of the Mexican rain gods reflect an alien cult of the ruling caste and therefore witness to its inclination to outside ideas, or whether they denote repeated penetrations from outside, the conclusion to be drawn is the same, namely that the southern Maya lowlands did not dwell in splendid isolation.[39]

Peaceful alliances between trading nations have soured on more than one occasion, often resulting in the use of force against erstwhile partners in the exchange of goods. At the least, contact between peoples through such means results in the diffusion of ideas, many of which might affect a society's direction. Of primary importance in this is the simple fact that foreign influences did play a role in the development of Maya civilization, and the corollary suggestion that such contacts with other peoples played a role in its violent end.

At this point in the examination of evidence and theories of violent collapse we have arrived at what might be termed the archaeological present. By the 1950's a great volume of data had accumulated, but publication of results lagged far behind, a fact demonstrated by such tardy publications as that of the Carnegie Institution of Washington authored by Alfred V.

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39. J. Eric S. Thompson, "Archaeological Synthesis of the Southern Maya Lowlands, in Gordon R. Willey, ed., Archaeology of Southern Mesoamerica: Part I in Wauchope, Middle American Indians, 2:358.

Kidder in 1950 which introduced the findings of excavations at Uaxactún that took place between 1931 and 1937. Nonetheless, through symposiums and correspondence, specialists were able to communicate their findings to each other for incorporation in works which appeared subsequently. But now pieces began to fit in a more coherent manner, even though numerous questions remain unanswered, as any Mayanist would quickly agree. The formulations of the past two decades are then, more complex, for archaeologists broke free from a mainstream trend of concentration on chronology, classification and description to perform the heretical act of cultural interpretation. What, for instance, are the implications of the identification of Central Mexican artistic and hieroglyphic motives on stele found in the lowlands of the Petén during Classic times? How are they associated with local ceramic manufacture of the same time, and with trade goods of foreign provenance? More important, what is revealed about the Maya and their history through such discoveries? Such considerations and others are brought to bear on the problem of the Maya collapse, and due to their complexity, will be granted broader discussion in the context of the "archaeological present" and the violent end of Maya civilization.

The maturation of archaeological theory will become evident with the following examination of the peasant revolt theory. That such a possibility existed was recognized early by

B. M. Norman, Edward H. Thompson, and Brasseur de Bourbourg, but received more detailed consideration by Alfred V. Kidder, who, crediting J. Eric Thompson and J. Alden Mason for the idea, expanded on the theme of "a revolt of the common people against their theocratic overlords."[40] This, he felt, could have been sparked by a series of poor harvests, coupled with an extraordinary labor burden, levied by an

> efficient but highly complex governmental machine, in the running of which the vast majority of the people presumably took no part. A machine of this sort once smashed and the rulers and their overseers done away with, it is easy to imagine that such a disastrous state of disorganization and leaderless anarchy might have supervened as to have resulted not only in the abandonment of the ceremonial centers, but also in suicidal strifes, famine, sickness, and so strong a feeling that the land was accursed that what little was left of the once large population gradually drifted away. People who actually left the country to join other groups would, under the social revolution hypothesis, have been mere hewers of wood and drawers of water, carrying little or nothing of the higher culture of their former rulers. Thus they would quickly have been absorbed and have left no archaeologically discernible trace of their origin.[41]

Proof of such an occurence was admittedly lacking, but had it happened as Kidder thought, there would have been little evidence save for the cited isolated instance of "ancient vandalism at Piedras Negras, where sculptures were ruthlessly battered in such a way as to suggest the fury of a revolt against the priesthood."[42]

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40. Alfred V. Kidder, "Introduction," Uaxactún, Guatemala: Excavations of 1931-1937, by A. Ledyard Smith, Carnegie Institution of Washington Publication, no. 588 (Washington, D.C.: Carnegie Institution, 1950), p. 9.

41. Ibid, p. 10.

42. Ibid.

In the formulation of Kidder's argument one can recognize a more complex chain of events to explain the collapse, but it was the late J. Eric Thompson who developed this theme to its fullest thus far. Given Thompson's eminent place among Mayanists, a thorough discussion of his theory is warranted. That is not to say his interpretations should be accepted in every case, as he frequently succumbs to what seems an overly subjective and "protective" view of the Maya, but his undisputed skills as an archaeologist, epigrapher, linguist, and ethnohistorian have granted him a tremendous insight to the Maya that few, if any, could equal. A general summary of his theory as first explored, follows:

> It is not illogical to suppose that there was a series of peasant revolts against the theocratic minority of priests. This may have been caused by the ever growing demands for service in construction work and in the production of food for an increasing number of nonproducers. Exotic religious developments, such as the cult of the planet Venus, adopted by the hierarchy may have driven a wedge between the two groups, making the peasants feel that the hierarchy was no longer performing its main function, that of propitiating the gods of the soil in whom, alone, they heartily believed. The gradualness of the collapse over the whole area argues against the view that there was strong central authority and in favor of the city-state theory. In my opinion, in city after city the ruling group was driven out or, more probably, massacred by the dependent peasants, and power then passed to peasant leaders and small-town witch doctors. The building program and the erection of stelae ceased abruptly, but the people still repaired to the ceremonial centers for certain religious services and perhaps for markets, but the buildings, no longer kept up, gradually fell into disrepair.[43]

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43. J. Eric Thompson, Rise and Fall, pp. 105-6.

It is not illogical to suppose such events occurred when Thompson's evidence is examined. His reconstruction begins with an examination of the social structure: the identification of a city-state political arrangement, with well delineated social classes under the leadership of a theocratic minority. As an epigrapher, aided by the necessary linguistic skills for decipherment, he noted the last known stele dates of selected sites, and agreed with Morley that "the collapse of the stela cult seems to have started across the base of the Peninsula of Yucatan" revealing a logical pattern for the spread of chaos in the central lowlands--beginning in the vicinity of Copán in 800 A.D., moving northward finally to overtake such sites as Yaxchilán and Seibal, whose latest known stele bear dates of 810 and 889, respectively.[44]

A pattern established, Thompson then looked for archaeological clues to bolster his conviction of the sudden catastrophe. "At Uaxactun" he noted, "the walls of the latest building were left unfinished," and "in some cases work ceased so suddenly that platforms built to support buildings were left uncrowned."[45] Though the population no doubt dispersed following the revolt, the area was not deserted, for at Uaxactún, burials were made on top of debris left in the wake of destruction. At nearby Tikal, "broken stelae were reset, even upside down."[46] Such activities, he felt "can be

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44. Ibid, pp. 105, 100. 45. Ibid, p. 100. 46. Ibid, p. 106.

attributed to the peasant population after the massacre or expulsion of the hierarchy."[47]

Further indications of disruption of Maya society were explored as well. At Altar de Sacrificios, "strategically placed at the confluence of the Pasión and Chixoy rivers" were discovered "nonlocal wares originating from somewhere along the bottom of the Gulf of Mexico."[48] Ceramic ware designated Fine Orange and Fine Gray were found at Altar in conjunction with figurines which showed a marked departure from the accepted Maya concept of beauty. Nearby Seibal revealed late Classic stele with "portraits of non-Classic Maya type, and in one case the hieroglyphs are non-Maya. Here" he continues, "we are dealing with the replacement of Maya rulers by foreigners in the last century of the Classic period who maintained the stela-raising Maya rite, but modified the art style and had heretical ideas about hieroglyphic texts."[49]

At first glance, this information seems incongruous with his theory of peasant revolt, but he considered this intrusion very late, and believed it "a minor factor in the collapse of the ceremonial centers, except that a usurping group would be an added reason for revolt."[50] He considered a full-scale invasion of non-Maya unlikely because of the nature of the archaeological evidence:

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47. Ibid.
48. Ibid, p. 107.
49. Ibid, pp. 107-8.
50. Ibid, p. 108.

> At Piedras Negras a magnificent dais had been deliberately smashed. This destruction might have been the work of invaders, but, equally well or better, it could have been an act of vengeance or spite by revolting peasants, since the dais was the seat of former rule. The fact that the figures of gods on the Piedras Negras stelae were not likewise destroyed indicates that the damage to the throne was inflicted by revolting peasants who attacked the symbol of their civil bondage, but respected the images of their gods.[51]

Here one can see the major problem of interpretation of evidence: destruction is noted, but the cause of damage is questionable, and allows, as Thompson concedes, alternative explanation. Such alternative reconstructions await consideration, but Thompson offers more information on the late Classic state of affairs. Moving from the central lowlands, Thompson examined the late Classic situation in northern Yucatán, which followed a different pattern as cities there were inhabited centuries longer than those of the Petén, and with the previously noted foreign influences, particularly at Chichén Itzá. A detailed discussion found in Maya History and Religion presents a new insight into late Classic history, and will be summarized briefly below.

Non-Maya influences have been detected throughout Yucatan, but nowhere to a greater extent than Chichén Itzá. After A.D. 918 a definite Mexican influence is identified, long believed the result of a Toltec invasion. Thompson believes these influences are associated with the Chontal Maya, who he suggests

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51. Ibid.

are the same as the Itzá, and prefers to call the Putun Maya, after their home in Potonchan. Gaining widespread influence throughout Mesoamerica, the Putun, from their homeland in Tabasco-Campeche, became famous as merchants: their location on the Gulf Coast allowed them to develop extensive trade routes by water and land. Of Maya linguistic stock, they nonetheless absorbed much of the influences from Central Mexico--including perhaps, a strong inclination to militarism and the adoption of many Mexican cult practices. By late Classic times trading bases were established along the peripheries of the Yucatán Peninsula, with one major post situated on the island of Cozumel, and another at Polé, on the mainland. From these footholds the Putun decided to impose themselves on the center of Chichén Itzá, a move which was effected by 918. These Mexicanized Putun imposed a new order on the Yucatec Maya, one which was eminently suited to Toltec refugees who accompanied the historical leader Kukulcan following his expulsion from Tula in the tenth century. It was late in the tenth century, then, that in league with the Putun, the Toltec artistic-architectural influence at Chichén Itzá began to forcefully replace that of the Yucatec Maya.[52]

The foregoing accounts for the many late and Post-Classic foreign influences in the northern lowlands in a reasonable fashion, but what of those Thompson noted at Seibal on the

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52. J. Eric S. Thompson, Maya History and Religion (Norman: University of Oklahoma Press, 1970), pp. 3-25.

Pasión River, and Altar de Sacrificios on the Usumacinta? These, too, are considered by Thompson the result of Putun expansion from the Tabasco-Campeche region by way of the Grijalva and Usumacinta rivers. Sixteenth century reports of Putun speaking Maya at Tenosique, not far downstream from major centers on the Usumacinta, led him to conclude they were the progeny of late Classic invaders. This he augments with his decipherment of Cipacti glyphs at Seibal--the name of the ruling lineage of Putun Potonchan. Further, he again considers the late ceramic sequences at Altar de Sacrificios and its postulated discontinuity with traditional wares with the presence of the previously mentioned Fine Orange and Fine Gray pottery. He ascribes their presence as imports from the Putun area along the Gulf Coast following their ascendancy over the "pure" Maya.[53]

What seems curious about Thompson's reconstruction is that, after explaining the means by which the Putun gained control, he does not consider their presence much more than an incidental factor in late Classic history, for he believes these new Putun rulers met the same fate as the rest of the Maya hierarchy, which earlier succumbed to revolt. Since the pattern of abandonment of Maya centers began on the opposite end of the Maya area from the sites along the Usumacinta and Pasión rivers, he maintains that earlier established "revolutionary conditions may well have given these

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53. Ibid, pp. 25-47.

invaders the chance to establish themselves at Seibal and Ucanal and, perhaps, earlier at Altar de Sacrificios."[54]

J. Eric Thompson's reconstruction of a peasant revolt and explanation of Mexican influences is wholly within the bounds of logic given the information presently available. Reviewing Thompson's theory, George Cowgill concedes that "it does seem a perfectly plausible suppostion," but "I know of no real evidence that such a sequence of events actually occured."[55] Nor does anyone else. Others who have examined much of the same evidence as Thompson suggest the collapse should be attributed to inter-city warfare between the Maya themselves. Beginning with the discovery of the Bonampak murals in 1946, the traditional view of the Classic Maya as "one of the least warlike nations who ever existed" has come under fire.[56] The colorful Bonampak murals present a vivid scene of capture and subsequent torture of prisoners, and though J. Eric Thompson maintains this depicts a mere raid and should not be interpreted as an evidence of a people preoccupied with war, a number of recent discoveries have shown the Maya very much practiced in the art of warfare, as Maler earlier surmised.[57]

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54. Ibid, p. 43.

55. George Cowgill, "The End of Classic Maya Culture: A Review of Recent Evidences," Southwestern Journal of Anthropology, vol. 20, no. 2 (1964), 154.

56. Thomas W. F. Gann and J. Eric S. Thompson, The History of the Maya (New York: Charles Scribner's Sons, 1937), p. 63.

57. Karl J. Ruppert, J. Eric S. Thompson, and Tatiana Proskouriakoff, Bonampak, Chiapas, Mexico, Carnegie Institution of Washington Publication, no. 602 (Washington, D.C.: Carnegie Institution, 1955), p. 51.

Robert Rands explored the theme of Maya warfare in his doctoral dissertation through examination of late Classic art. Though he came to no definite conclusions about warfare he voiced doubts about the traditional view, that the Maya

> ceremonial centers were too poorly defended to withstand attack and the dispersed population too vulnerable. If warfare is visualized with the technological limitations presumably present at that time, however, the form taken by the centers appears to provide adequate protection. In the absence of mechanically propelled missiles such as the arrow and atlatl darts, the steep-sided platforms which form the base of plazas and buildings afford promising possibilities for defense.[58]

Others agree that defensive technologies were necessary, and this view was substantiated by a discovery by Dennis Puleston and Donald Callender, Jr. While mapping structures at Tikal, they found "a 9 1/2 km. long defensive earthworks. The earthworks lie directly between Tikal and the nearest large site, Uaxactun."[59] This, they argue, indicates a need for protection--not necessarily from outside invasion, but from their Maya neighbors. Such a view is reinforced by excavations undertaken at Becán, Campeche, in 1970. Here, in 1934, Karl Ruppert and John Denison discovered what they considered defensive fortifications. Most fellow archaeologists smugly dismissed such an untraditional view, since everyone knew the Maya were pacific until the late Classic influx of Central

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58. Robert L. Rands, "Some Evidences of Warfare in Classic Maya Art." (Ph.D. diss., Columbia University, 1952), p. 165.

59. Dennis E. Puleston and Donald W. Callender, Jr., "Defensive Earthworks at Tikal," Expedition, vol. 9, no. 3 (1967), 40.

Mexican militaristic traits. Time has borne out the basic assumption of Ruppert and Denison, and a study of Becán's defensive technologies by David Webster suggests that "the fortifications reflect large-scale warfare in the internal developmental process of lowland civilization itself."[60] Many possible causes for inter-site warfare might be proposed, including rapid population growth, and the strategic location of some sites which were erected "to dominate important trade routes or political boundaries, and consequently were turned into fortified strongholds. I personally believe" continues Webster, "that there were sufficient indigenous stresses in Maya society to explain the existence of the Becan defenses and that no necessary explanations involving foreign intrusions need be sought."[61]

Norman Hammond attacked this problem by attempting to discern what particular Maya centers exerted control over nearby sites, that is, to find a political hierarchy of late Classic centers. Hammond prepared a map showing the density of late Classic sites in the central lowland area, along with a proposed sustaining area, of population and resources for each. He believes the Maya were engaged in a continuous

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60. David L. Webster, "The Fortifications of Becan, Campeche, Mexico", Archaeological Investigations on the Yucatan Peninsula, eds. Margaret A. Harrison and Robert Wauchope, Middle American Research Institute, Tulane University Publication, no. 31 (New Orleans: Tulane University, 1975), p. 127.

61. Ibid.

struggle among themselves to consolidate spheres of influence and gain firm control of coveted natural resources necessary for a burgeoning population. Though he does not propose this as the cause for the collpase, it serves as additional reinforcement to the belief that the late Classic Maya constantly faced internecine warfare.[62]

Two major areas of study offer promise of clarification of late Classic spheres of influence. The first of these is the study of trade patterns, of both inter-site and long distance commerce. These patterns should reveal what Maya centers were at peace with each other on the basis of commercial exchange. The late E. Wyllys Andrews IV suggested as much after examination of mollusca found in the Maya lowlands, observing that in the southern Maya lowlands

> imports included a number of less impressive Pacific species whose very similar Atlantic cousins could be obtained much nearer. At Copan . . . nearly all the archaeological shell was of Pacific origin, despite the proximity of the Gulf of Honduras. Even at Piedras Negras at the north corner of the Peten, Pacific influence is prominent. More interesting is the fact that the central Peten sites appear to have imported most of their Atlantic shell not from the nearby Caribbean, but from the considerably more distant Gulf of Mexico.[63]

To the north, in Yucatán, the pattern was more logical, as mollusca at Dzibilchaltún and Chichén Itzá are "traceable to

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62. Norman Hammond, "The distribution of Late Classic Maya major ceremonial centers in the Central Area," in Mesoamerican Archaeology, New Approaches, ed. Norman Hammond (Austin: University of Texas Press, 1974), pp. 313-331.

63. E. Wyllys Andrews IV, The Archaeological Use and Distributions of Mollusca in the Maya Lowlands, Middle American Research Institute, Tulane University Publication, no. 34 (New Orleans: Tulane University, 1969), p. 60.

the nearest convenient beaches, with a handful of exceptions apparently brought from the more distant Caribbean coast. This might imply ethnic barriers to trade of which we are not otherwise aware."[64]

Current investigations on the island of Cozumel, long recognized as a major religious shrine, should further illuminate the nature of trade patterns, and perhaps indicate if Mexican (or Putun) "groups were cutting the Lowland Maya out of trade networks."[65] Results may show late Classic Maya centers resisting a "Mexicanoid" usurpation of trade along northern Yucatán, which prompted them to turn to the Pacific oriented trade patterns, thus providing the Putun with a motive for conquest of the southern lowlands, already wracked by political disputes and the economic hardships of changing an established commercial network.

The second area of study which may clarify spheres of influence among the late Classic Maya is in its infancy, and might be termed, literally, Classic Maya history. The Maya have often been considered a prehistoric people, not because they did not write, but because we have been unable to read their inscriptions. Miss Tatiana Proskouriakoff broke new ground not by her suggestion that Maya hieroglyphs did not

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64. Ibid, pp. 59, 60.

65. Jeremy A. Sabloff and William L. Rathje, "A study of changing precolumbian commercial patterns on the island of Cozumel, Mexico," Atti Del XL Congresso Internazionale Degli Americanisti (Roma: Congress of Americanists, 1972), p. 457.

pertain solely to astronomical-religious matters, but by her demonstration that many glyphs were actually of an historic nature, recording the names and dates of accession of sovereigns as well as their accomplishments.[66] Tentative relationships between late Classic centers have been postulated on the basis of hieroglyphic interpretations. The Yaxchilán Jaguar Dynasty seems to have spread its influence to the Usumacinta site of Chinikihá and further into the central Petén, at Tikal and Aguateca.[67] The nature of the Jaguar Dynasty's relationship to Tikal's Sky Dynasty is presently being explored, as is the Sky Dynasty's tie with Quiriguá and Copán. It seems very likely that a series of diplomatically inspired marriages between dynasties cemented alliances between Yaxchilán, Tikal, Copán, and Quiriguá, though much work remains to substantiate such hieroglyphic interpretation.[68]

Decipherment of hieroglyphics may eventually reveal documentary evidence of alliances and enmities between late Classic centers, but without positive proof, Mayanists are left with the prospect of continued differing opinions about life and death in the late Classic. At this point, one can only say that

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66. Tatiana Proskouriakoff, "Historical Implications of a Pattern of Dates at Piedras Negras, Guatemala," American Antiquity, vol. 25, no. 4 (1960), pp. 454-75.

67. Merle Greene, Robert L. Rands, and John A. Graham, Maya Sculpture of an Ancient Civilization, Rubbings (Berkeley: Lederer, Street and Zeus, 1972), pp. 42, 300.

68. John P. Molloy and William L. Rathje, "Sexploitation among the Late Calssic Maya," in Mesoamerican Archaeology, pp. 431-444.

there is substantial evidence of conflict among the late Classic Maya, but no means of directly linking such evidence with the Classic collapse. More acceptable are the suggestions of those who place a greater weight on external considerations while recognizing that a complex Maya hierarchical system may already have staggered from a variety of internal forces which contributed to their inability to cope successfully with an invasion.

A recent proposal by George Cowgill accepts, like Thompson,

> a period of Mexican invasions, affecting the entire Maya lowlands, lasting some years, possibly several generations; during this time strife and social disorganization were prevalent, resulting in substantial decline, but not extermination, of population throughout the lowlands. The final outcome may have been control over the entire lowlands by a relatively small group of invaders, who then set about to consolidate their power over the Maya survivors, ruling the whole region from a single capital at Chichen Itza. I suggest that the invaders may have more or less forcibly resettled the inhabitants of the whole Maya Lowlands, moving them to localities within easy reach of Chichen Itza.[69]

Such a reconstruction offers a solution for the disappearance of the peasant population from the central lowlands, and is not unreasonable when one recalls that the Peruvian Inca as well as the Spaniards forced conquered Indian groups to settle in newly established towns to facilitate control over them. Cowgill, aware of the pattern of abandonment beginning in the southern and southwestern region, postulated that the resettlement movement may have been "assisted by a northward retreat

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69. Cowgill, "The End of Classic Maya Culture," p. 155.

of the Maya from attacks which struck first at the southern and southwestern parts of the lowlands."[70]

Cowgill did not specifically mention Seibal as an indication of Mexican influences, though he did name nearby Altar de Sacrificios in that respect, but it is Seibal, like Chichén Itzá, which offers a fresh insight to foreign influences during the late Classic.[71] Unlike Chichén Itzá, little information had been obtained from Seibal other than the brief reports by Teobert Maler of his investigations in 1895 and 1905, and of Sylvanus Morley, who explored the site in 1938.[72] In 1961 new explorations were initiated, and in a preliminary report of 1966 A. Ledyard Smith and Gordon Willey offered hopes of gaining a new body of substantial information from that site.[73] The following year saw Willey and Jeremy Sabloff present an excellent synthesis of data at their disposal from the whole of the lowlands, coupled with new findings from Seibal, to announce a theory of invasion:

> In boldest form, the hypothesis states that the Southern lowlands (the Guatemalan Peten and bordering portions of Chiapas and Tabasco) were invaded by non-Classic Maya peoples. This invasion began

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70. Ibid.

71. Ibid, p. 151.

72. Gordon R. Willey and A. Ledyard Smith, "A Temple at Seibal, Guatemala," Archaeology, vol. 20, no. 4 (1967), 290.

73. A. Ledyard Smith and Gordon R. Willey, "The Harvard University Explorations at Seibal, Department of Petén, Guatemala: The 1964 Season," XXXVI Congreso Internacional de Americanistas, 1964, (Sevilla: Congress of Americanists, 1966), p. 388.

> in the 9th century A.D., and it set in motion a train of events that destroyed the Classic Maya within 100 years.[74]

The Classic setting was considered precarious, with strains placed on an agricultural technology by a booming population. Willey and Sabloff agree with Thompson on

> the interpretation of Maya socio-political structure as relatively feeble and lacking those powers of coercion that would have protected it against revolt from within. But would not this same feebleness have rendered it relatively helpless to attack from without?[75]

Linking the non-Maya style stele which appeared at Seibal at the beginning of the Tenth Katun (A.D. 830) with the new fine paste ceramics they were able "to isolate over twenty specific stylistic elements and themes which are present on both the sculpture and Pabellon-Modeled-carved pots and sherds."[76] They believe the pottery, along with non-Classic Maya figurines, were of Gulf Coast origin, and that the discovery of an atypical round temple could also be linked with a Mexicanized people.[77] Neighboring sites along the Usumacinta-Pasión rivers yielded corroborationg evidence. Fine paste ware has been discovered at Altar de Sacrificios, Yaxchilán, and Piedras Negras, as well as at Palenque in Chiapas. The

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74. Jeremy A. Sabloff and Gordon R. Willey, "The Collapse of Maya Civilization in the Southern Lowlands: A Consideration of History and Process," Southwestern Journal of Anthropology, vol. 23, no. 4 (1967), 312.

75. Ibid, pp. 317-18. 76. Ibid, p. 322.

77. Ibid, pp. 322-23.

fine paste ware is cited as a major evidence of intruders, as chemical analysis of sherds indicates its origin in the Jonuta region of Tabasco, and findings from careful ceramic studies at Palenque by Robert Rands reveal that "soon after the introduction of Fine Paste wares at Palenque there was a complete decline."[78]

The invasion began in the Usumacinta-Pasión area as well as northern Yucatán, by peoples from the Gulf Coast region, who then "sent raiding parties throughout the Central Peten."[79] Conquest was possibly effected through use of "superior military weapons, including the dart and atlatl" along an invasion trail which

> may have first been pioneered by the merchants or armies of Teotihuacan several centuries earlier. At that time, there appears to have been a crisis in Classic Maya civilization, suggested by the hiatus in stelae dates which lasted from A.D. 534-593.[80]

Following the Mexican ascendancy at Seibal, the strains of conquest and an interrupted milpa cycle rendered the new rulers impotent to marshal the conquered Maya into a viable organizational structure which could support them.

> Faced with a lack of traditional leadership, many of the Maya may have tried to eke out an existence in scattered jungle milpas. It is also likely that many others migrated northward to attach themselves to centers in Yucatan which were more successfully maintained than in the south.[81]

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78. Ibid, pp. 324-25, 324.
79. Ibid, p. 327.
80. Ibid.
81. Ibid, p. 328.

Reviewing the above reconstruction, one particular problem arises. Sabloff and Willey agreed with George Cowgill, that perhaps the Maya retreated from the southern lowlands in the face of invasion, but that appears contradictory to their formulation, that the invasion began in the Usumacinta-Pasión bases should have produced a pattern of abandonment beginning in the northern lowlands, causing the people to flee toward the south, contrary to the evidence of dated stele. This problem, however, was to be resolved as Willey further pursued the evidence in a later synthesis, which included even newer data from the Usumacinta-Pasión.

The publication of Richard Adams' study of ceramic sequences at Altar de Sacrificios in 1971 and 1973 found him, as one might suspect, in agreement and at odds with the newer hypotheses of J. Eric Thompson and Jeremy Sabloff and Gordon Willey. Armed with crisp words for Thompson, he rejected the "ethnic tag" given to the so-called Putun, doubting that the sixteenth century "ethnic and linguistic distributions accurately reflect the situation of the period of the Maya collapse, about 700 years before."[82] He felt Thompson misrepresented the archaeological facts by dating the Putun incursion at Altar prior to that at Seibal, as Adams dates Altar's foreign influences some twenty to forty years later than those

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82. Richard E. W. Adams, "Maya Collapse: Transformation and Termination in the Ceramic Sequence at Altar de Sacrificios," in Classic Maya Collapse, p. 157.

at Seibal.[83] Where Thompson considered the Boca and Jimba ceramic phases at Altar de Sacrificos contemporaneous and foreign, Adams established that such was not the case, and maintained the former ignored evidence available to him. The Boca pottery revealed foreign influence in motives, but still exhibited a great continuity with previous sequences, and was essentially Maya. The latter part of the Boca phase suggested "intriguing links with northern Yucatán. Pottery decoration and figurines reflect an increased interest in warfare. These ceramic changes are correlated with the cessation of monumental erection of large-scale monumantal construction."[84] He saw close links between Seibal and Altar under the domination of "an intrusive militaristic and 'Mexicanized' Maya group with headquarters at Seibal."[85]

However, with the advent of the Jimba ceramic phase, the pottery "suffers a sudden and completely discontinuous change."[86] Stylistically, the wares are linked to the Gulf Coast region, and physical types represented on the pottery reveal non-Classic Maya traits. Noting the geography of the region, Adams correlated terminal stele dates at sites between Altar and the Gulf Coast, and postulated

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83. Richard E. W. Adams, The Ceramics of Altar de Sacrificios, Guatemala, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, vol. 63 (Cambridge, Mass: Peabody Museum, 1971), p. 165.

84. Ibid, p. 161. 85. Ibid, p. 162. 86. Ibid.

> that the people who made Jimba pottery moved from lowland Chiapas-Tabasco . . . across the area east to Bonampak to the Usumacinta upriver and southeast of the sites of Yaxchilan and Piedras Negras. From there they moved down the Usumacinta against Yaxchilan and Piedras Negras and later into the Altar region.[87]

This movement, he believed, was only the first of several invasions by non-Maya, and paved the way for eventual intrusion into the area by the Toltec. In terms of overall effect on the Classic Maya he noted:

> Widespread repercussions undobtedly resulted from such a disruption of the Maya world. Local conditions at sites far away from the Pasion may have determined the special nature of the collapse in any one region. Civil wars and local disasters may have combined with the morale-shaking news from the Pasion to induce the abandonment of local leadership and ceremonial centers.[88]

Gordon Willey subsequently revised his earlier theory of invasion to accomodate the latest findings of Adams at Altar, and has forcefully presented the most coherent explanation of the Maya collapse yet printed. He agrees with Adams that Thompson was in error by placing the Boca and Jimba ceramic phases of Altar de Sacrificios side by side; but he accepts Thompson's identification of the Putun invaders. He sees two sets of foreign influences in the Pasión Valley, the first at Seibal, which reveal the large number of Mexican-Toltec motives. Through correspondence with E. Wyllys Andrews IV, he learned that many stele motives and stuccos

> are very similar to stuccos from the site of Becan in the Rio Bec region of southern Campeche. In other words, a case could be made out that Seibal came under

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87. Ibid, pp. 162-63.

88. Ibid, p. 164.

> the influence of peoples from Becan, or peoples related to those of Becan, early in the ninth century A.D. These may have been Chontal or Putun Maya.[89]

This first Putun incursion was followed some time after A.D. 849 by a second, this time originating from the "lower Usumacinta-lower Grijalva region. This second set of influences may have been a continuation of the first," and is recognizable by more "'Mexicanoid' representations in stelae at Seibal, and at Altar de Sacrificios by the Fine Orange and Fine Gray Wares."[90] Then, "shortly after A.D. 889 Seibal is abandoned," and at about the same time, the last identifiably Maya ceramics at Altar (Boca) give way to the Jimba complex, which had a short-lived span before Altar sank into obscurity.[91]

Willey's reconstruction, aided by recent research by Adams and others along the Usumacinta-Pasión valleys, in conjunction with Thompson's assignment of expansionist tendencies to the Putun Maya, brings a semblance of order to divergent interpretations. Some differences of opinion seem more fancied than real; for instance, Adams' acceptance of the Tabasco-Campeche area for the origins of "Mexicanoid" influence, but his rejection of Thompson's identification of the craftsmen as Putun. Willey basically accepts Thompson's proposed history

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89. Gordon R. Willey, The Altar de Sacrificios Excavations, General Summary and Conclusions, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, vol. 64 (Cambridge, Mass.: Peabody Museum, 1973), p. 61.

90. Ibid. 91 Ibid.

of the Putun expansion, but cannot agree that the Maya centers fell to revolt when it appears that the Putun were the primary agents of destruction. Instead Willey concludes that

> Maya Classic Period troubles, including all of the exacerbations of preexisting stresses and strains within that society, was most basically instigated by the cutting off of trade, to the west and to the north, and that this was done by the Chontal or Putun Maya. Some few sites, such as Seibal, were given a brief, late lease on life by Putun alliances; but as the Postclassic Period continued, such sites were found to be too far from the coast and from the main trade routes to be maintained as profitable concerns.[92]

Whether or not the Classic Maya collapse can be attributed to peasant revolt, internal strife culminating in intercity warfare, or invasion, an examination of the evidence of violence in the Classic period reveals, at the least, that the traditional interpretation of the Maya as a peaceful people little concerned with offensive warfare or their own defense must be revised. The formulations of the past two decades are predicated on a much more substantial body of knowledge than earlier theories, but even so, imagination continues to play a major role in interpretation. This is much in evidence with J. Eric Thompson's theory of peasant revolt--after painstakingly, though not flawlessly, as Adams was quick to observe, tracing the course of Putun expansion through the Maya area, he maintained his belief that such an invasion was only an incidental occurrence prior to the revolt of the

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92. Ibid, p. 62.

oppressed and forgotten Maya peasantry. In like manner, though more and more information reveals a pattern of endemic warfare among the Classic Maya, it still entails a shaky leap of faith to believe the Maya civilization fell from this cause alone, and few are willing to allow that a misnamed "civil war" between autonomous city-states was the primary factor in the collapse. The remaining alternative, invasion, musters far more support from all available sources, and has the luxury of weighty more documentable logic to offer as an explanation of the Classic Maya collapse.

CHAPTER VI

CONCLUSION

What happened to the Classic Maya? One can say with certainty that the highly organized ceremonial life ceased; that the population centers in the core area of the central and southern lowlands were abandoned; and that the priests and dynastic rulers, once resplendent and confident in the exercise of authority, relinquished their combined grip on the populace, and fell prey to the same march of time that rendered other once brilliant civilizations lifeless and forgotten. Why this happened has not yet been explained to the satisfaction of more than a slight number. Modern descendants of the Classic Maya remain ignorant of the rich cultural legacy and history bequeathed them by their ancestors, and some of them, when confronted with the sight of the crumbled ruins of their forefathers, tremble--not with pride--but in fear, for spirits of the ancients inhabit the fallen temples and the rain forest which envelopes them. Their memory of the past does not encompass the time when their race scaled great heights and created a fabulous civilization.

The Spanish priests of the post-Conquest years may have been able to provide us with much reliable information when

they gathered the ancient hieroglyphic codices which recorded the Maya achievements. Unfortunately, they collected the books only to destroy them, for neither the reigning Spanish monarch nor the local encomendero wished to rule over a pagan people. The written histories of the Maya were consumed in the fires of Spanish zealots, and so today we are forced to rely upon archaeological inference to explain the terminal events of Classic Maya history. Through the years archaeologists and anthropologists have provided us with much valuable data, but the variety of interpretations based upon the same information, provides only suggestions rather than definitive explanations for the collapse.

From the preceding chapters one can see that the Classic Maya were subject to numerous stresses, both internal and external, but the impact of each postulated difficulty remains debatable. Local circumstances and internal stresses no doubt played a role in the fall of the Classic Maya, but the following reconstruction of the collapse will place the major emphasis on invasion, an invasion prompted by the economic motives and imperial designs of a people J. Eric Thompson calls the Putun Maya. First the setting of the Classic Maya will be examined, keeping in mind that within the Maya area there will be numerous exceptions to the summary offered here.

The thick rain forest which today covers the silent ruins of ancient Maya centers once was cleared. Life in Classic

times was highly organized, and the population was expected to contribute its services to the gods--and to their representatives on earth--the priesthood and the dynastic rulers. We shall view the Maya hierarchy within each city-state as a powerful entity, for the material accomplishments which capture the imagination of the modern world could not have been effected without a power of considerable magnitude. Though it seems a rigid class structure was maintained, it is here considered that the hierarchy, though powerful, was essentially non-coercive, that the civilization arose because each segment of society had something to offer and to gain from the other. The hierarchy offered protection to the peasant, a market for goods of craftsmen, and through the centuries of unceasing monumental construction, a sense of security and stability for all. The priesthood was a fundamental source of authority within the hierarchy, for their sway over the populace was great. Through priestly prophecies, augurings, and astronomical calculations, the peasants were informed of the most propitious moment for the planting of the milpas to assure the best possible harvest. Religious convictions were deep rooted among the Maya, and the pomp and ceremony associated with priestly rites and festivals convinced most that the priesthood was a necessary link between the gods and men. Surely the gods paid far more heed to the supplications of feathered and painted priests in their massive ornate temple

sanctuaries than to the daily prayers offered in the champas, the huts of the common people. Rites of blood-drawing and of human sacrifice could not fail to please the gods, and over such ceremonies only the priests presided. Respect was demanded. This respect for the priesthood was in some measure transferred to the political rulers, whose alliance with the Holy Ones was close, the dynastic rulers often grooming members of their clan to serve in a priestly capacity. However, none of the accomplishments of the Classic Maya could have been effected without the peasant, who worked in his milpa to provide the agricultural surplus that specialized occupations demand. That generations of peasants would unwillingly serve the Maya hierarchy seems unlikely. As in later times, discontented Maya could have migrated from the population centers and established themselves in small units, far from hierarchical control. We must assume that the Maya peasant possessed sufficient incentive to remain a member of Classic society, even if his role was that of a subordinate, perhaps ranking on the social scale only above the slave. It has been said that the monumental building programs of the late Classic Maya were successful only through the exercise of a coercive authority over the entire population. One need only look at modern capitals throughout the world and ask if they were constructed in the same manner or whether a measure of free will motivated the laborer.

We have briefly examined the Maya microcosm, but must remember that for the most part, Maya city-states were autonomous. Through the years of the Classic period, a burgeoning population began to cause a multitude of internal problems. Though the various city-states were united in culture, each had its own political aspirations. The large number of Classic population centers and their proximity to each other occasioned an increasing number of serious conflicts. With a large population to sustain, each city required more land for agricultural purposes. Land with high harvest potential was coveted, and border wars with neighboring city-states resulted. Sometimes the neighboring city bacame an ally; in other cases a long history of destructive raids marked their association. The many indicators of violence found throughout the Maya area--carved on stele, or announced by strategic location of sites and the construction of defensive fortifications--attest to a culture which was very early initiated into the art of war.

Competition also extended into the economic sector. Not all sites were blessed with a superabundance of natural resources. The accessibility of some natural resources was limited by animosities between city-states, and sometimes a nearby source of supply was ignored in favor of procuring materials from a more distant location through trade. Spheres of influence through trade cannot yet be described accurately,

but it is certain that Tikal was a major point of redistribution of goods from many places, including Teotihuacán, before its destruction in the latter part of the seventh century.

The widespread distribution of trade goods within the Maya area is here considered a major cause of the Classic Maya collapse. An intricate network of distribution wove its trails to virtually every Maya center, large and small. The need for goods to exchange fueled the economy of each city-state. The farmers supplied the surplus to feed the craftsmen, who in turn produced pottery, featherwork, carved jade, and other items for export. Of course the hierarchy would benefit mightily from the collection of duties as well as from the special attentions of wealthy merchants seeking favors. This very prosperity was the death knell of the Classic Maya. Early in the Classic period the lure of rich natural resources and the proven talent of Maya craftsmen tempted merchants from distant Teotihuacán to extend their influence to the Maya homeland. Impressed with what they found, merchants, who often served as spies, convinced the political authority of Teotihuacán to conquer the highland Maya, cousins of the lowlanders, at Kaminaljuyú, Guatemala. From the highlands the Teotihuacanos controlled the rich natural resources of both the mountains and the nearby Pacific coast. Some of the raw materials, especially obsidian, were taken to Teotihuacán,

via Monte Albán in central Oaxaca, for use by their craftsmen, while they traded others with the lowland Maya of Tikal, perhaps using the highland Maya as middlemen. With the fall of Teotihuacán, about 650 A.D., a power vacuum was created, throwing the commercial economy of the Maya into chaos.

Slowly the Maya recovered, but it was a painful process. New trade routes and markets had to be discovered. This was impeded by the increased competition among late Classic Maya centers for territorial and economic ascendancy over their neighbors, and during that time internal warfare became endemic. Out of such unrest came some diplomatic alliances, as those previously noted, between Tikal, Yaxchilán, Copán and other centers. In the main, however, intercity warfare became a way of life, and it disrupted the old order while impeding the emergence of a new.

This disruption was not unnoticed by those Maya identified as the Putun. The Putun, a people whose life was intimately bound with their role as merchants, may prove the key to the Classic Maya collapse. We will follow the Putun Maya from their homeland in Tabasco-Campeche, as they expand their influence through trade around the Yucatán Peninsula. They were frequent visitors to Central Mexico, and seem to have benefited from the destruction of Teotihuacán, as they assumed the primary role in a pan-Mesoamerican trade network. Assimilating many cultural traits of the militaristic post-Teotihuacan Mexicans, they established themselves by force

and diplomacy at Cozumel, Polé and other locales, almost encircling the Maya area with outposts. Recognizing the vast potential of the lowlands, they began a program of conquest to protect and to further develop their trade. This was greatly facilitated by the internal situation of the Maya, who in the face of invasion, could not resolve their differences long enough to repel the outsiders, related by blood, but foreign in custom. Early in the ninth century, the Putun, with several footholds on the periphery of the Yucatán mainland, pushed inland to Chichén Itzá, to Becán, and also to Copán, Quiriguá, and thence north and northeasterly throughout the Petén. This was not accomplished in one fell swoop, but entailed a number of advances encompassing a period of years. A second major thrust emanated from the Tabasco-Campeche region, initially employing the Usumacinta River system to transport Putun warriors as far as possible, and thence by land via Yaxchilán, Piedras Negras, and Bonampak, to establish rule at Seibal and Altar de Sacrificios.

The conquest of the central Petén proved futile, as the Putun invasion wreaked havoc on the milpa cycle on which the large population depended, and severely rocked the foundations of a society already foundering. The invaders attempted to establish themselves as the legitimate sovereigns, destroying the images of previous dynasties, though not the images of the gods. However, depopulation through battle, famine, sickness, and migration in the face of conquest left the

glory-eyed Putun in possession of only the crumbled shell of the once brilliant civilization they hoped to rule.

The situation in the peripheral western-central area along the Usumacinta-Pasión drainage differed. Sites along the Usumacinta and Pasión were closer to the Putun home in Tabasco-Campeche than the central Petén, so control was facilitated, and the centers of Seibal and Altar de Sacrificios were occupied long enough to construct some monuments and buildings in the Mexicanoid style. Occupation at Seibal and Altar de Sacrificios continued until the Putun hierarchy recognized the futility of the commercial venture at places so isolated from major trade routes. Had the central Petén conquest resulted in only a change of leadership and not depopulation and abandonment, a series of inland trade routes could have been profitably maintained, as they were by the Classic Maya. Instead of becoming vital links in a new Putun-controlled commercial pattern, centers along the Usumacinta-Pasión were recognized as dead weights to an errant master plan of conquest. Far from the newly emerging trade routes, the last centers of the peripheral central area were abandoned by the new rulers shortly before the beginning of the tenth century.

Putun energies were then consolidated in the northern lowlands of the Yucatán Peninsula. Chichén Itzá prospered and became a new Putun-controlled capital. Much of the Classic Maya population of the southern lowlands, deprived

of traditional leadership, sorely missed the benefits of a strong state as well as the mysterious priestly ceremonies and festivals that had long been a part of their history. Some migrated to the new Putun centers in Yucatán, while those who stayed behind organized into small groups in the rain forest, often returning to the now deserted Classic Maya centers to offer sacrifices, and as at Tikal, to reset fallen stele, sometimes upside down, in a pathetic attempt to find continuity with the past. Putun success in northern Yucatán continued for centuries, and a new society emerged--one of the Yucatec Maya, the Putun, refugees from the central and southern Maya lowlands, and Toltecs in the company of Kukulcan in his flight from Tula. The mix of peoples and traditions caused Yucatán to prosper--from the commercial energies of the Putun, coupled with the desires of Classic Maya refugees to approximate a way of life they were forced to leave behind.[1]

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1. This conclusion is the author's, though it follows the general outline as laid down by J. Eric S. Thompson, Maya History and Religion, (Norman: University of Oklahoma Press, 1970) with consideration of counter-arguments by Richard E. W. Adams, The Ceramics of Altar de Sacrificios, Guatemala, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, vol. 63 (Cambridge, Mass: Peabody Museum, 1971) and Gordon R. Willey, The Altar de Sacrificios Excavations, General Summary and Conclusions, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, vol. 64 (Cambridge, Mass: Peabody Museum, 1973).

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