

THE USES AND ABUSES OF THE ANCIENT MAYA

by

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Prepared for *The Emergence of the Modern World* Conference
Otzenhausen, Germany

Organizers Jared Diamond and James Robinson

INTRODUCTION

I happen to study an ancient people – the Classic Maya (AD 250-900; Fig. 1) – who are both immensely popular and widely misunderstood by the public. Popularity guarantees perennial interest in archaeological research (and generous funding), but also means that people invest the Maya with their own hopes, fears, and prejudices. Archaeologists are a bit two-faced about all this. They strive to preserve the aura of mystery and romance that surrounds these ancient people, and at the same time to understand them better and to correct widespread misconceptions about them. One might fairly say that both the public and professional archaeologists have appropriated the Classic Maya for their own purposes. In this paper I hope to provide some insights about how we have used and abused the Maya, along with a frank discussion of what we know and don't know about them.

I thought long and hard about the title of our conference – “Emergence of the Modern World”. Taken at face value, it indicates a concern with tracing the roots of our modern world in inchoate forms evident in earlier times and cultures – essentially an exercise in cultural evolution and historical continuity. In this perspective the ancient Maya tradition ranks pretty low in its contribution to modern life compared, say, to those of Mesopotamia, Greece, Rome, Egypt, or China. All of those great traditions of culture (and others I could list) have bequeathed basic institutions, vocabulary, ideologies, cuisine, canons of art and architecture, and much else to modern people in general, or at least to very large segments of today's humanity. Except for a short-lived burst of enthusiasm for Maya architectural conventions early in the 20th century, and some English loan words such as “cigar”, “cacao”, and “shark”, ancient Maya culture has had little direct effect on modern life, excepting of course the many people of Maya descent living in

various parts of Latin America, who are justly proud of their ancestors and who preserve many of their ways of behaving and thinking about the world.¹

Nor were these other great traditions ever lost or forgotten, whereas the Maya were unknown to Old World people prior to 1502, and the Classic Maya were only slowly “rediscovered” by scholars beginning in the early to mid-19th century. If I confined my remarks to our direct substantive “inheritance” from the Maya I would have little to contribute to our conference. Instead I will address the human propensity to extract meanings from the past that mirror our own concerns, values, prejudices, and preoccupations, and that appear to offer lessons or cautionary tales about how we should behave. Here the Maya have heavily influenced our collective cultural imaginations. They figure prominently in Jared Diamond’s book *Collapse*, for example, and more recently Mel Gibson has loosed upon us his bloody epic *Apocalypto* (I intend no disrespect to anyone by this juxtaposition!). I’ve seen this film twice, and it would be a tempting cheap shot to spew out a few thousand words deconstructing and criticizing it (and not a little perverse, because I rather liked it as pure entertainment). Instead I’ll quote Richard Schickel, who reviewed the film for *Time Magazine*:

“Gibson loves operating in that historical territory where the record is sketchy and subject to mythic reinvention, which leaves him—and anyone else—free to fill in the blanks with whatever dubious ideological instruction he likes” (Schickel 2006: 85).

Put another way, we generally don’t do so much appropriate for our own purposes what we *know* about the past, but rather the lacunae and ambiguities that allow us to find the meanings and messages congenial (or at least useful) to us. In this respect ancient Greeks or Romans or Chinese are a bit discouraging -- they are too well documented to allow free rein to our imaginations, and besides, one has to learn too much about them. On the other hand, the Classic Maya fit the bill perfectly – we know just enough to find them fascinating, but there are lots of blanks we can fill in to our own satisfaction.

A handy place to begin is with a story that I’ve told before, but that bears repeating because it is so pertinent to Schickel’s remark. In 1970 I was excavating the imposing fortifications around the Maya center of Becan, smack in the middle of the Yucatan Peninsula and at that time a rather remote place (now there is an adjacent Club Med). No Maya defenses like Becan’s had ever been systematically investigated before, and they turned out to date to about AD 250-300, or right at the beginning of Classic Maya times. One day a wealthy tourist landed his private plane on our improvised airstrip and we gave him a tour of the site. He was much gratified by the temples and palaces that we had cleared, but became visibly agitated as I showed him around the fortifications. When we finished, he asked me beseechingly if I was quite certain this was a defensive system. When I said yes, he blurted out “Goddammit, somewhere in the world there must have been a peaceful civilization”!

¹ Maya archaeological sites are, to be sure, visited by millions of people each year, although most tourists know little about the Maya past.

This gentleman had eagerly internalized a then prominent myth about the Classic Maya – that apart from a little raiding for sacrificial victims they were a peaceful (and therefore unprecedented) civilization. Obviously for him this “peaceful Maya” myth was an attractive intellectual refuge at a traumatic time – right in the middle of the Vietnam war. Its roots, however, go back at least to the 1880’s, and by the mid-20th century the idea was firmly entrenched in both the archaeological and popular literature. The Classic Maya were portrayed as a creative, intellectual people, led by priest-rulers, who somehow escaped the dreadful cycles of conflict so common elsewhere in the world. This bucolic view of Maya culture peaked, predictably enough, during the late 1940s and early 1950s in the immediate aftermath of World War II. The Maya appeal as a real-life counterpart of James Hilton’s *Shangri-La* helped cement the perspective in the public imagination, and most archaeologists accepted it as well. In their lack of war, as in (ostensibly) so many other things, the Maya were seen as unique among ancient civilizations, and in fact outside the mainstream of world cultural evolution. This perverse reputation, it turned out, was very good at attracting interest and research funds.

Just how this “peaceful Maya” myth took hold is still a mystery to me because there was plenty of evidence for Classic Maya violence and warfare, and certainly the Maya encountered by the Spaniards in 16th century Yucatan were notably bellicose, both in their actions and in their own traditions of historiography. For whatever reasons, archaeologists (except a handful who were largely ignored) dismissed or explained away this evidence. They also failed to undertake research that assessed the dubious contention that the Classic Maya were virtually unique among ancient civilizations in their avoidance of war.² In other words, they helped create and perpetuate a vacuum of evidence conducive to what Schickel calls “mythic reinvention” (or more properly in this case, “invention”). Before 1960 Maya writing could not be deciphered, so our ignorance about its content left another big blank to be filled. The “peaceful Maya” idea and other elements of what is called the “Maya Mystique” have been radically undermined in recent decades (see Webster 2006) because of better archaeology and better understanding of the inscriptions. Consider this recent characterization of Classic Maya war:

"It may well be that vengeful dynastic vendettas, total destruction of cities and the enslavement of whole populations occurred throughout Maya history" (Martin 2000: 176).

Here the myth has turned 180°, transforming the “peaceful Maya” into militarists of Assyrian or Aztec proportions. Gibson takes this perspective to its bloody extreme at a time when the world (not uncoincidentally) is once again threatened by seemingly uncontrollable and sinister forms of violence. Personally I take all this with a great grain of salt, despite the fact that I have spent a considerable portion of my career documenting Maya warfare. I suspect that the ordinary Maya person was assailed or inconvenienced by war only on rare occasions, and that he or she witnessed only a handful of human sacrifices (if any) during an entire lifetime. However this may be, our once fond ideas about Maya peacefulness have been totally changed. Whatever else

² I say “virtually” because similar claims are still made for Bronze Age Minoan civilization on Crete and for the Indus Valley civilization. Interestingly, the early Minoan and Indus Valley scripts have so far resisted decipherment, rendering these societies “nonhistoric” in much the same way the Classic Maya once were.

the Maya were like, we can no longer regard them as paragons of political tranquility. Some similarly radical restructuring of our understanding of ancient Romans is unimaginable.

BASIC ISSUES CONCERNING THE CLASSIC MAYA

I have singled out the following issues as particularly pertinent to the theme of the conference:

- 1) What were the larger cultural contexts within which Maya civilization emerged?
- 2) What environmental factors limited or challenged Maya development, and on the other hand allowed the Classic Maya to become so populous, literate, and artistically developed?
- 3) What limitations or opportunities were imposed by the availability of domesticable wild plants and/or animals, or the arrival of domesticates?
- 4) What do we know about Maya population, social organization, extent of political control, and subsistence base?
- 5) What kinds of things did the Maya trade in the form of luxury goods or necessities?
- 6) Why did other peoples such as the Aztecs and Incas unify their regions of the New World, while the Maya did not?
- 7) How do we explain the famous Classic Maya Collapse? Were there earlier collapses?
- 8) What were the Maya were like when seen by the first Spaniards in the early 16th century?

I will try to answer or comment on each of these questions, although not necessarily in this order. As we shall see, some of them have no answers, and others have too many. I accordingly emphasize what Mayanists agree about and what we disagree or argue about (which is a lot!), while giving my own opinions on debated issues.

One last comment before turning to the Maya. Norman Yoffee (2005) recently argued that the evolutionary models used by anthropologists are not only flawed, but have caused archaeologists (and especially American ones) to try to force the ancient complex societies they investigate into rigid categories such as “state” or “civilization”. While I disagree with Yoffee about many things, he does have a point. Archaeologists yearn to see the particular cultures they study as just as worthy of grandiose labels as any others. This is part of a professional status game that we too often play among ourselves. I think that Mayanists commonly betray this impulse --- if the Aztecs or the Chinese had cities and markets and social classes and dense populations then the Maya must surely have had these things too, even if the evidence for them is debatable or non-existent.

THE MAYA

When the Spaniards arrived in the culture area anthropologists call Mesoamerica in the early 16th century, they found complex polities dominated by kings and nobles. Commoners, most of whom were peasant farmers on well-tended agrarian landscapes, paid tribute and taxes to these great lords. Powerful families lived in imposing centers that served as political and ritual capitals. Temples, palaces, ball courts, schools, monumental sculptures, and other buildings comprised the core infrastructure of such places, some of which were true urban centers. Professional priests kept books and complex calendars, and ideas about gods, ancestors, sacrifices, cosmology, and cosmogony were widely shared, as were rituals, calendars, and

symbols associated with them. Professional merchants brought slaves, obsidian, feathers, chocolate, gold, animal skins, jade, and a host of other valuable things to great markets. Basic elements of this distinctive New World pattern of civilization began to coalesce about 1600 BC.

Mesoamerica as a whole has contributed hugely to the wider world, and particularly to our agricultural economies. The tropical grass maize was domesticated there, and along with a host of other plants (e.g., tobacco, chocolate, tomatoes, avocados) it has immeasurably enriched human well being (or at least, in the case of tobacco, gratification). The Classic Maya were one regional variant of this much broader tradition of civilization. Eastern and southern Mesoamerica was their homeland, and their most famous cultural florescence took place in the tropical lowlands of Mexico, Guatemala, Honduras, Belize, and El Salvador during the 7th-9th centuries, an interval called the Late Classic period. These are the Maya everyone knows about, although the span of Maya culture history was much longer.³

The Maya as First Seen by Europeans

The first Mesoamerican people that the Spaniards met were the descendents of the Classic Maya, and they were concentrated in the northern part of the Yucatan peninsula, far from the old Classic heartland. At least 600,000 Maya speakers lived there in the 16th century, divided into hundreds of small, local polities. Each was headed by a leader called a *batab*, a petty ruler of noble descent with a few hundred or a few thousand subjects. These *batabs* made alliances and wars with each other, and sometimes a particularly powerful one managed to dominate others and patch together a larger kingdom that might have 50,000 people or more. These great lords were distinguished by the title *halach uinic* and also sometimes styled themselves in the old Classic Maya fashion as *ajaw* (lord, king, ruler). A class of hereditary nobles collectively called *almehenob* dominated affairs. Nobles lived in fine houses, governed towns, and were supported by the taxes and labor of commoners and slaves. They owned plantations of cacao trees and were patrons of trading expeditions. Temples were the principal buildings, where priests kept images and books and oversaw many annual ceremonies, regulated by a complex calendar that recorded cycles of 256 years.

Because many of these cultural features were apparently old and well-established, some archaeologists believe that the 16th century northern Maya can provide us with insights about the institutions and behaviors of their Classic forebears to the south (this is called the “direct historical” approach). Sensible as this idea sounds, archaeologists have in fact long picked and chosen the cultural elements they wished to project back in time. Warfare, already discussed above, is a case in point. We have always known that the 16th century Maya were notoriously warlike, but few archaeologists were comfortable with attributing such belligerency to the Classic Maya. On the other hand, certain aspects of 16th century Maya world view and ritual behavior were routinely presumed to be very ancient. Such selectivity allows students of the Classic Maya to ignore cultural features that do not fit their preconceptions, and emphasize those that do, when using ethnohistoric analogies.

³ Powerful Maya kingdoms and dense populations were also found in the highlands of southern Guatemala and southeastern Mexico in the 16th century. We will not consider them here, except to say that many inferences about the Classic Maya are drawn from them, as well as from their Yucatecan cousins.

I agree with the direct historical assumption up to a point, but the Maya of northern Yucatan at all times had rather distinctive cultural patterns (rather, say, like people of northern and southern Germany, or England and Scotland), and we must not lose sight of the great differences that surely existed. According to their own histories, the northern Maya had been strongly influenced by incursions of Mexicans, which helped make their culture rather distinctive. Sixteenth century leaders used the ancient kingly *ajaw* title, but clearly they were not kings in the old Classic sense. Many elements of Classic culture appear to have been lost or rejected, such as the style of royal presentation (particularly royal inscriptions), elaborate polychrome pottery, and the Classic Long Count calendar. Sixteenth century populations were much smaller than Classic ones, and both their institutions and subsistence strategies must have been quite distinctive. For example, it is tempting to imagine that Classic Maya people were organized into lineages or that they possessed slaves, just like the 16th century Maya. Sensible as such backward projections appear, they might be totally wrong and must be independently confirmed from archaeological or epigraphic data. Just such data are what eventually convinced most archaeologists that the Classic Maya had serious forms of warfare. Using the Maya whom the Spaniards met as analogues to the Classic Maya is thus both sensible and dangerous – a little like trying to understand the Bronze Age Greeks by projecting back from what we know about Athens, Thebes, or Sparta in the 5th century BC.

Maya Origins and Interactions in Mesoamerica

Although Maya people in the linguistic and ethnic sense of the word are very ancient, the emergence of a distinctive Maya form of Mesoamerican civilization was associated with other, and somewhat earlier, complex societies. Chief among these were several cultures that developed during Early and Middle Preclassic times (1200-400 BC), most notably the Olmecs of the Gulf Coast of Mexico. At least by 800 BC the Olmecs and their contemporaries practiced productive agriculture based mainly on maize as a staple crop. They erected monumental buildings, produced spectacular art, and clearly had many of the ritual practices, institutions, symbols, and elements of the Mesoamerican world-view that eventually were expressed more widely in Mesoamerica (Diehl 2004). Writing and complex calendars were invented by some of these Preclassic peoples (by whom and when are subjects of debate), and they clearly had complex sociopolitical systems, dominated by kings and dynastic lines. Widespread trade or other forms of exchange widely disseminated local innovations and created the first pan-Mesoamerican cultural horizon.

By at least 700 BC the Lowland Maya began to take conspicuous part in this larger tradition, and thereafter they erected their own monuments and developed their own distinctive art styles. Recent discoveries show that huge centers with sophisticated architecture began to appear in the Mirador Basin of northern Guatemala in Middle Preclassic times (Hansen 2004). Writing, distinctive art, and (probably) ruling dynasties, and hereditary nobles were all firmly in place there, and in other parts of the Maya Lowlands, by 200 BC and possibly earlier.⁴ Not too long

⁴ The evidence for kings this early is a bit equivocal, given the paucity of art and the very few (and unreadable) early inscriptions. If there were no kings prior to, say, AD 150, then huge construction projects were undertaken in places like the Mirador Basin based on some other dimension of political centralization. Most archaeologists would accept that lines of kings at Tikal, and possibly a few other places, existed at least by the first or second century AD, or the

ago archaeologists associated all of these things with the Classic period (after AD 250), but we now agree that all this cultural complexity had its roots deep in the Preclassic.

We do not know this early Maya stage of development well enough yet to understand what it owes to the Olmecs or other contemporary cultures outside the Maya Lowlands. Some archaeologists see the Maya as late bloomers and borrowers, indebted to the Olmecs and their contemporaries. Others think that by Middle Preclassic times the Mirador Basin (and other) Maya were full partners in the emergence of Mesoamerican civilization. Most would admit that the style and symbols of rulership were introduced from elsewhere. Whatever the case, the Mirador Basin system experienced a major collapse at the end of the Late Preclassic (around AD 150), and the region never recovered more than a tiny fraction of its population. The center of gravity of emergent Classic society shifted further to the south, where sites such as Tikal, Uaxactun, and Calakmul came to dominate the political and cultural landscape.

Somewhat later the Maya, like many other Mesoamerican peoples, were heavily influenced by the great Central Mexican urban civilization of Teotihuacan, which directly or indirectly meddled in Maya dynastic politics and economics (Martin 2003). Signs of a Teotihuacan presence during the 4th and 5th centuries AD are unmistakable. Maya kings wore Mexican-derived regalia and portrayed Teotihuacan symbols on their monuments. Some of them probably traced ancestral or dynastic connections with Teotihuacan. Pottery, obsidian, and other objects or materials were imported from the highlands, and local artisans and architects mimicked Teotihuacan styles. Around AD 550-600 Teotihuacan lost its dominance and was partly abandoned, although the Maya long remembered its heritage. The Classic Maya reached their apogee during the next 300 years, refining and elaborating many shared or borrowed concepts to an extraordinary degree. Architecture, art, and inscriptions from this Late Classic interval are what the world knows as iconically “Maya”.

Given this tangle of complex relationships with other societies, the Maya are no longer seen as a precociously gifted people who were the “Mother Culture” of ancient Mesoamerica, as they were long regarded. Societies like Teotihuacan were much more urban in character, much larger in scale, and much more influential in political, economic, and cultural terms than the Classic Maya ever were. Given all this cultural indebtedness, it is a tribute to the industry and hype of Maya archaeology that these other societies are more poorly known and much less interesting to the public.

Technology, Environment, and Agriculture

Like all Mesoamericans, Maya people faced several serious challenges, most importantly those imposed by simple technology. The Maya possessed no utilitarian metals such as iron, steel, or bronze that would have made cutting, digging, hoeing, or others tasks more efficient. All tools and weapons were essentially made from “Stone Age” materials – stone, wood, bone, and fiber.

very end of the Late Preclassic. There were probably earlier rulers, but we know little about their roles compared to Classic kings. The institution of kingship clearly evolved in Maya society, and Late Classic kings were probably conceived of rather differently even than their Early Classic (AD 250-600) counterparts, much less their Preclassic ones.

They also lacked even simple machines (such as wheeled vehicles) or other devices (such as sails) that increased work efficiency or captured non-human forms of energy. Contributing to this latter deficiency was the absence of large domestic animals that could be used for traction or transport.⁵ Most work, in short, was accomplished by unaided human muscle (abetted by certain forms of energy such as fire for land clearing, etc.).

Several consequences result from this technological impoverishment. First, agricultural practices and the amounts of land that could be cultivated were geared closely to the capacities of human labor, particularly that of the individual farmer and the domestic household. Second, potential surplus food production was constrained compared to that of many Old World farmers, particularly those in Europe or Asia, where plows and draft animals were used.⁶ Third, ecological niches that in the Old World would have been filled by pastoral or semi-pastoral people remained unoccupied or underutilized. Fourth, transport costs were high because (except where waterways were available) everything was carried on human backs. Especially restricted were the movements of cheap, bulk goods such as basic foodstuffs, so subsistence economies tended to be quite localized. Logistical constraints also inhibited, or otherwise affected, the emergence and maintenance of large, dense urban populations, the conduct of wars, and the character of long-distance commerce. Ancient Mesoamerica thus presents Westerners with a counterintuitive evolutionary history – the development over many centuries of societies of impressive scale, complex institutions, and sophisticated intellectual attainments, all without much technological innovation.⁷

Another challenge was the landscape (Gomez-Pompa et al, 2003). Classic Maya civilization emerged and reached its 8th century maturity in an set of environments that in many ways were unfavorable to the development of complex cultures and dense populations. As recently as the 1950s some anthropologists claimed that Maya civilization must have developed elsewhere and then been intruded into the Lowlands, where it was doomed to eventual failure (Meggers 1954).

The Classic Maya heartland of about 130,000 sq km is dominated by a limestone substrate that weathers into fertile, but thin upland soils that support a semi-deciduous tropical forest under natural conditions.⁸ There are few permanent rivers in the Lowlands (mainly along its western

⁵ As Jared Diamond noted in his book *Guns, Germs, and Steel*, the general lack of large domestic animals in the New World insulated native peoples from many infectious diseases associated with animals that afflicted Old World populations.

⁶ Even today, when metal tools and new crops are available, Maya farmers commonly cultivate only about two hectares of land. Much of their surplus household production is used for market exchange or to feed domestic animals.

⁷ There were some changes – copper, gold, and silver were worked after about AD 600. There were also changes in the scale of the existing technology. Although sophisticated forms of irrigation are very old in Mesoamerica, for example, they were certainly applied on larger scales in the 16th century.

⁸ Several important Maya centers and polities developed and thrived in upland environments that have rather different local ecologies. One of these is Copan, in the mountains of western Honduras. Another is the remarkable site of Ceren, in a fertile highland valley of El Salvador. Non-Maya speakers might have composed parts of the populations of both regions. Although often envisioned as forest people, the ethnographically known Maya typically view forest, or more specifically wild, uncultivated land, as sinister and dangerous (see Taube, 2003).

margins and in the region of Belize) because most drainage is subterranean.⁹ A tropical climate with a pronounced wet-dry season provides rain for crops, but precipitation is unpredictable in its abundance in any year, and multi-year drought intervals are frequent. Agricultural populations (at least dense ones) thus face both annual and long-term risks that cannot be ameliorated by stream irrigation except in a few places, and even water for household use is often limited during the dry season. Forty percent or more of the landscape of the southern Maya Lowlands is composed of closed-basin swamps (*bajos*), some of which hold water throughout the year. These *bajos*, along with artificial reservoirs called *aguadas*, were the only sources of dry season drinking water for many Maya people. We know that at some centers the Maya skillfully engineered their buildings and plastered plaza surfaces to channel runoff into storage facilities for later use, but we argue about how extensive and effective such systems were and what their consequences were for Maya political development. Although the Yucatan Peninsula has a long coast, most large and dense Classic Maya populations were located inland, so exploitation of marine food resources was limited.

Some evidence exists for wetland modifications in the form of terracing, drained fields, or transport of bajo soils to create upland fields. All these stabilized agricultural productivity and diminished drought risk, but archaeologists disagree on how extensive or productive they were, and their dates.¹⁰ We also don't understand whether constructions like terraces increased productivity, or instead represented "coping" strategies that have no implications for ever-larger populations (Murtha 2002). A related problem is food storage. In dry environments like that of ancient Egypt food surpluses could be stored indefinitely, helping to ameliorate annual risk. In lowland Mesoamerica it was very difficult to store harvested food for more than a year or so.¹¹

Fortunately the Maya possessed the tropical grass maize as a staple crop. The earliest direct evidence for domestic maize anywhere in Mesoamerica dates to 4300 BC (Piperno and Flannery 2001), and humans probably began the domestication process centuries earlier. Maize was introduced into the Maya Lowlands sometime well before 2000 BC (we don't know for certain which, if any, plants in the general Mesoamerican repertoire were domesticated by the Maya themselves).¹² For a long time the presence of maize seems to have had no appreciable effects on Maya population size and density. In fact, in Mesoamerica as a whole one would be hard-

⁹ Large rivers were essential to the development of other ancient civilizations, especially because of their transport capacities. For example, virtually any commodity could be moved cheaply and efficiently to any part of the Nile Valley using traditional watercraft. Watercourses near inland sites like Tikal sometimes have impressive flows in the wet season, but are reduced to dry arroyos in the dry season.

¹⁰ Drained fields are best documented in the back-swamps of rivers, particularly in Belize. They have not been widely observed in the far more abundant enclosed swamps of the interior of the peninsula.

¹¹ In highland Mexico maize could be stored for some years; see the impressive royal granaries built by the rulers of the Aztec empire as described by Anderson and Barlow (1943).

¹² Signs of the disturbance of natural vegetation consistent with some sort of agriculture appear by about 3000 BC in western Honduras, and are found elsewhere thereafter. What is probably maize pollen shows up in sediment cores in the Copan Valley about 2600-2700 BC, long before direct archaeological evidence of humans (Webster et. al 2005).

pressed to identify a well-established pattern of agricultural villages prior to 1500-1600 BC.¹³ Quite possibly maize was first used as a non-staple crop adjunct to a wider economy that included other domestic plants as well as wild resources. After about 800 BC maize became a common theme in Olmec art, and Middle-Late Preclassic populations increased rapidly in many parts of Mesoamerica. My opinion is that maize only became really productive about this time and that it is responsible for the remarkable florescence of the Middle Preclassic Olmecs, along with many contemporary sister cultures including those of the Maya Lowlands, and more particularly the Mirador Basin.

Maize is grown more like a garden plant than a field plant such as the Old World small grains, wheat and barley. It can be extremely productive even when cultivated only with simple hand tools, routinely yielding in ancient times 700-1800 kg of edible food per ha (a family of 5 would consume about 1000 kg in a year) and under some conditions much more. Also contributing to its productivity is that it was not broadcast, as the Old World small grains often were, and so only a very small proportion of each crop had to be used as seed for the next one. The tropical lowlands, with a long growing season, no frost, and (at least initially) fertile soils appear to have been ideally suited to growing maize, which was supplemented by many other plants (some, like beans, squash, and probably manioc, were grown alongside it in the same fields, as they are today).

Oddly, a big bone of contention among Mayanists is the agricultural strategies that supported their populations – i.e., what crops they grew and how they grew them. I say oddly because we do not argue much about the agrarian habits of ancient Sumerians, Egyptians, or Chinese. There are three reasons why these issues are more contentious for the Classic Maya. First, unlike these other cultures, the Maya left behind no detailed economic records in epigraphic form. Second, organic material does not preserve well in tropical environments, so archaeological inferences are few. Much more important, however, is the widespread presumption (discussed at greater length below) that the Maya were so numerous that they must have depended on staples in addition to (or instead of) maize (e.g. root crops or tree crops), and that they resorted to complicated strategies of arboriculture, management of “artificial rainforests”, micro-niche manipulation, and “landesque” investments in their landscapes, such as terracing and drained fields. This view rejects all or part of the earlier idea, drawn from direct historical analogy with the 16th century Maya, that maize was the dominant staple and mainly produced using extensive, slash-and-burn agriculture (but see McAnany 1995, and Fedick 1996 for alternative opinions).

Recent isotopic studies of Classic Maya skeletons show heavy caloric dependence on maize, so one issue is being sorted out (Gerry and Krueger 1997). Maize was, unsurprisingly, one of only two plants that Mesoamericans revered as gods (the other was maguey) and maize suffused Maya thought and images in Preclassic and Classic times.¹⁴ Kings associated themselves with maize imagery and their monumental inscriptions are replete with agricultural tropes. The whole

¹³ The interval between the appearance of the first Mesoamerican domesticates (and maize was not the earliest) and this threshold of village farming is 4500-5500 years. In the Near East the transition was much shorter, about 2000-2500 years. This comparison reminds us that while agriculture evolved independently in several parts of the world, the details of the process were quite different from place to place, not least in the pace of change.

¹⁴ Many other plants were of course symbolically or ritually associated with gods.

world was often envisioned as a four-sided maize field. Other potential staple crops such as manioc or sweet potatoes were known to the Maya and were clearly used. Years ago David Rogers (1965) speculated that the root crop manioc (or cassava, *Manihot esquntla*) was domesticated in southern and eastern Mesoamerica and was important in the development of Maya civilization.¹⁵ These plants were basic staples in other parts of the world, and often have yields much higher than maize. For unknown reasons (possibly related to the ideological dominance of maize) they never seem to have assumed comparable economic importance among the Maya. Most archaeologists, me included, agree that the agrarian economy and diet of the Classic Maya were heavily based on maize.

Pre-modern human numbers and well-being were everywhere regulated not by optimal or average conditions, but by the bad times. All ancient farming systems were subject to risks that adversely affect food production. Many risks could not be anticipated or controlled by humans, and were specific to particular environments. For example, the uncontrollable height of the Nile flood was the major risk factor for ancient Egyptian farmers. The Nile flood and many other kinds of perturbations are independent of human action, but others are caused or exacerbated by humans. For example, deforestation might cause soil erosion, which would lower soil moisture and increase the risk of crop loss.¹⁶ Maya farmers faced many agrarian risks of both kinds, including droughts, hurricanes, plant diseases, insect pests and predators, and anthropogenically-induced loss of soil fertility. War or social disorder could also disrupt the agricultural cycle and destroy crops.

Some risk factors can be very subtle. For example, Mesoamerican farmers routinely plant different varieties of maize under different conditions in different fields. This strategy uses diversity to ensure desired yields by dampening certain risk factors. Maize, however, is a wind-pollinated plant and fields must be placed at considerable distances apart (at least about 200 m) to maintain the genetic integrity of landraces. This was not a problem for long-fallow swidden farmers. By the end of the Classic period, however, land use was probably so intensive that much of this variety was eliminated, with attendant increases in risk. Similarly, an “artificial rainforest” strategy (if it ever existed) would probably have been impossible or ineffective under conditions of high population density.

Ancient farmers everywhere utilized four kinds of strategies to hedge against risk: diversity, mobility, physical storage, and exchange (Halstead & O’Shea 1989: 3). Classic Maya farmers, however, were unusually hobbled in using these strategies compared to people in many other parts of the ancient world. Diversity of food sources was low compared to Europe or Asia, most importantly in the absence of large domestic animals as alternative food sources. Without herd animals mobility on the landscape was curtailed, and options to move to vacant land were further limited by the social circumscription resulting from large, dense populations. Long-term storage

¹⁵ Remains of a just-harvested fossil manioc field have recently been discovered by Payson Sheets and his colleagues at Ceren, El Salvador.

¹⁶ Deforestation was not only a consequence of agriculture, but also of household requirements (building materials and fuel) and burning for lime production, something that is often overlooked by those who envision the Classic Maya as careful stewards of the agricultural potential of their forests. See Schreiner (2002) for an eye-opening analysis of the demands of lime production.

of grain was impossible, and there were no animals to store resources “on the hoof”. Finally, the “low energy” character of Maya transport technology ruled out bulk food exchanges over long distances. In times of trouble Maya farmers had far fewer choices than their counterparts elsewhere, one reason for the recurrent crises that we shall discuss shortly.

Ancient Maya Historical Demography

Classic Maya civilization was once thought to be unique among early agrarian states because, as we just saw, the farmers who supported it supposedly used extensive forms of agriculture and (consequently) had small and dispersed populations. This brings us to the subject of population size and density. No surviving precolumbian documents anywhere in Mesoamerica record census data, and their absence, particularly for the Maya, provides fertile ground for wishful thinking. Populations must be modeled using indirect means, and estimates vary widely (Culbert and Rice 1990). In fact, archaeologists have wrangled more or less continuously about demographic issues since the 1960s. On the one hand, some posit enormous populations -- individual kingdoms are claimed to have had a million people. Overall population densities on the inhabitable and agriculturally useful parts of the landscape are confidently asserted to be 250-300 people per sq km around AD 700, and much higher – 500 per sq km or more – on the peripheries of major Maya centers.¹⁷ For comparison, Egypt, the famed breadbasket of the ancient Mediterranean world, had an overall density when the Great Pyramids were built of about 47 people per sq km, and roughly 132 per sq km 2800 years later during the height of the Roman occupation.¹⁸ Just how the Maya were able to support far greater densities on their less hospitable landscape (if they did so) has stimulated much speculation. Some of my colleagues envision the Classic Maya as sophisticated tropical ecologists who utilized various forms of forest management or arboriculture, transformed whole landscapes to make them more fertile and sustainable, and micromanaged local ecological niches. Evidence for such expertise and agricultural intensification, they believe, both justifies and explains the high population estimates for Classic times, particularly for the 8th century.

Other archaeologists, myself among them, take a skeptical view of such high estimates and think there were far fewer Maya than commonly supposed. For many years I did archaeological survey and demographic reconstruction at Copan, a famous kingdom in a mountain valley in western Honduras (Fig. 2). When I began this work I confidently imagined that the population of the kingdom during its 8th century heyday was at least 50,000 people. Based on my own research and that of colleagues such as John Wingard (1996), I now think that the Copan king around AD 800 might have had 20,000 subjects, but that’s about it (Webster 2004). More recently I completed a project around the much larger center of Tikal (Webster et al., 2007), where I also think population was lower than generally believed. In my opinion one of the really big kings of the 7th or 8th centuries (and there were only a handful) probably had no more than 50,000 to 100,000 subjects in his core kingdom. Some of the most famous archaeological

¹⁷ By overall density I mean simply the ratio of population to territory in any given large region, without correction for variations in the landscape or patterns of land use.

¹⁸ The estimate of 1.6 million people for 2500 BC comes from Butzer 1976: 85, and assumes that the habitable/cultivable area of the Nile delta and the floodplain together is 34,000 sq km. There are no good census data for these early times, but Butzer’s reconstruction is widely accepted (e.g. see Lehner 1997: 7).

centers or royal capitals, such as Piedras Negras and Palenque, probably had resident populations in the 2000-6000 range immediately in and around their monumental site cores (Barnhart 2007, Nelson 2005). These concentrations, so far as we can tell, formed the bulk of each kingdom and provided most of the available labor.

Archaeologists tend to inflate their estimates in part because they correlate large, dense populations with cultural complexity. Of course some societies of essentially tribal or folk farmers attain very respectable population densities. For example, according to Paula Brown (1978: 100, 106) the Chimbu of highland New Guinea have densities of 135-175 people per sq km in cultivated zones, and overall densities of about 87 per sq km. I estimate peak overall densities for the Copan Valley only about 55 people per sq km (not much higher than Brown's upper limit for swidden agriculture in New Guinea), and densities on the valley's core cultivated landscape (134 sq km) at about 134 per sq km (these were not maintained for more than a century or two). Another reason why some Maya archaeologists like high population estimates is that it makes the collapse much more dramatic and catastrophic (about which more shortly).

The high densities some archaeologists ascribe to the Classic Maya are impressive, but there are other suggestive demographic patterns. Local Maya populations tended to have spotty spatial distributions and to fluctuate markedly through time. If stability and/or steady rates of increase are our measures of demographic success, then the Maya present a puzzling overall picture beginning in Preclassic times. As we already saw, the Mirador Basin, which covers about 2200 sq km, had a dense population prior to AD 150 but thereafter was all but abandoned. Other regions had respectable Late Preclassic populations, then experienced apparent demographic declines during the Early Classic, only to recover after about AD 600. Moreover, the population peaks of specific Late Classic polities and regions are not always well synchronized. Some polities had single bursts of population growth and decline, while others had more complex patterns. Some individual kingdoms lasted for a millennium, while others appeared, flourished, and disappeared in a century. We do not know what all of this means, but there appear to be considerable ebbs and flows of population on the landscape, which argues for recurring crises and movements of people. Just such fluctuations and migrations figured prominently in the native histories of northern Yucatan many centuries later. None of this is consistent with the "expert tropical ecologist" perspective.

Arguments about the size of Classic Maya populations are too detailed and too boring to discuss here. More interesting are the reasons for disagreement, especially considering that the Maya left us a very complete and visible archaeological record of Classic period house remains. Until the 1940s and 1950s archaeologists assumed that Maya populations were quite small and thinly distributed, with densities in the range of 20 or 30 people per sq km (consistent with long-fallow slash and burn agriculture). Few systematic settlement surveys on any scale had been done, so one could defend this position in the absence of household data. Since then many surveys have shown unexpectedly dense household remains on Maya landscapes, especially around the immediate peripheries of great Maya centers. Such remains constitute one data set from which to model population estimates.

The Demographic Implications of Monumental Architecture: I think these dense remains have fooled us, and that our projections based on them are often much too high. These projections are distorted by commonly shared biases. As already noted, dense populations are assumed to indicate cultural complexity. Even more important, many Maya archaeologists today are impressed by the scales of Classic Maya civic, ritual, and palatial architecture. These buildings are (at least sometimes) really big and often heavily decorated. Surely, the reasoning goes, they could not have been built by small populations. A couple of years ago I was contacted by a television producer who was making a series called something like “Great Engineers of the Ancient World”. I’m afraid my comments disappointed him. I said that while we might consider the Maya great builders they certainly were not great engineers, if by that label we mean people with sophisticated knowledge of materials and their capacities, construction systems, and intricate architectural designs.¹⁹ As a comparative example, the people who built Hagia Sophia in Constantinople in the 6th century would have found a big Maya pyramid no challenge at all, but no Maya architects ever conceived a similarly complex structure, nor could they have built it if they had.

Even the “great builder” assessment can be questioned. When one does a bit of experimental archaeology and then models the “cost” of big structures, they turn out to be much less “expensive” in energetic (and hence political) terms than we imagine. For example, using work estimates generated by experimental archaeology (Abrams 1994), I calculate that Tikal’s imposing 8th century Temple 1 could have been built over a period of seven years by 130 people (most of them non-specialists), each working for three months during the dry season. This is not much of a labor imposition on a local population that is asserted to be at least 45,000-62,000 people. Even if that population were reduced by 75%, such a construction project would be easily within its capacity.

Some years ago I published a paper (Webster and Kirker 1995) laying out this and other estimates. I concluded that what was remarkable was not the abundance of big Maya buildings, but rather that they are so few. I take great pride in the fact that my article is hardly ever cited, because it means I’ve said something profoundly embarrassing to most Mayanists. Better to hope, as the archbishop’s wife said about Darwinian evolution, that if the idea is true it does not become widely known.

Some archaeologists have suggested that the greatest construction efforts -- and especially large tombs and temples -- occurred early in the histories of ancient civilizations because emerging polities were still insecure and their rulers had to assert themselves by exceptional and very public displays of power and legitimacy. Later on, when the ruling institutions were more mature, royal effort was directed elsewhere. Put another way, big public projects help to consolidate kingship, create new institutions, and remold the collective identities of subjects. One can make such a case, for example, for Egypt, where nothing on the scale of the Pyramids was attempted after about 2400 BC, and also for the great city of Teotihuacan in Central Mexico, where the Street of the Dead complex was mainly finished before AD 250-350.

¹⁹ There are one or two sets of features that show some engineering acumen, such as the complex drainage system beneath the site of Palenque, but generally Maya efforts were big, not sophisticated.

I'm dubious, though, about this proposition as a generality. An important question is whether the production of impressive monuments is the essential consideration, or whether the actual mobilization of labor is in itself the message, quite apart from its products (Trigger 1990). If the former is the case, then the necessary infrastructure was in place at Teotihuacan early on, and why should it be replicated later? We would not expect continued monumental efforts --- political energies could be expended otherwise. Consider another example. The Mexica (Aztecs) built comparatively modest ritual or public structures, but utilized enormous amounts of labor to create infrastructure. The Aztec causeway/dyke system, which was approximately 80 km in length, was built during a short interval in the mid-late 15th century. I calculate the volume of material used in just one 9.5 km long causeway segment of this system at somewhat over 266,000 cu m. This is enormously larger than any single civic structure the Aztecs built, but only a fraction of the total effort they invested in causeways, dykes, canals, and aqueducts. All this was accomplished midway through a very short evolutionary interval (the Aztec empire lasted less than a century) so whether they did this "early" or "late" is a rather fruitless question. The larger point is that while the constructions themselves were not as psychologically obtrusive (or as useful for political spectacle) as temples or other public buildings, no one could miss the power message embodied in the use of mass labor itself.

The "early monumental architecture" idea is difficult to apply specifically to the Maya for two reasons. First, unlike Egypt or Teotihuacan or the Aztecs, the Maya never achieved anything resembling the permanent, effective, political centralization of a very large region. One would therefore have to ask this question not of the Maya as a whole, but of some particularly long-lived polity. At Tikal, for example, which had a history of over a millennium, the answer would be no -- the biggest buildings were not built early on, contemporary with the emergence of the first kings. A second problem is that the Maya at all times tended to make larger buildings by covering older ones (in the case of temples) or expanding them (in the case of palaces). What looks new and visually striking is often just the latest accretion to a core of older buildings -- there is much less to it than meets the eye.

A better question is whether, as particular ancient polities matured, rulers mobilized more or less *per capita* energy from their populations? With regard to the Classic Maya I suspect the answer is less for public architecture. In fact, the "output" of monumental architecture during any time interval is less impressive than we think. Big things were built, but because late populations were larger than earlier ones, less per capita labor was needed. From the perspective of Maya leaders, impressions were managed without undue political cost -- and this of course is the trick for any political leader at any time. And here the Aztec example given above provides an interesting contrast. The small causeway segment I cited required a fill volume roughly 13 times greater than that of a famous Classic Maya building such as Temple 1 at Tikal. I bring up this comparison because Maya archaeologists have occasionally remarked to me how much more impressive many of their epicentral buildings are than the main Aztec pyramid-temple, the Templo Mayor in the Aztec capital of Tenochtitlan.

Returning to the original issue of population size and density, I think we have created for ourselves a problem that might not really exist, and then have struggled to solve it for years. The answer to "Why were there so many Maya?" could simply be "There weren't nearly as many as we imagine". If Egyptians could build all three of the "great" pyramids (and many other things)

within 90 years using the labor available from a population of about 1,600,000 people (overall density = 47 per sq km) then even the largest Maya constructions could easily have been built by much smaller populations than usually envisioned. Such an adjustment in our thinking would also explain why signs of intensive agriculture or “landesque” capital improvements to the Maya landscape (e.g., terrace systems, drained fields) are so spotty in distribution, so limited in scale, and sometimes not contemporaneous with peak population intervals. Maybe there were so few Maya that a mix of simpler, less intensive strategies sufficed for a very long time. It is worth remembering that archaeologists two generations ago thought the great Classic centers were built and maintained by small, dispersed populations of swidden farmers. The idea that big populations were necessary to explain big buildings emerged later.

Art, Writing, Mathematics, and Calendars: Implications for Complex Institutions

This brings us to the issue of Maya “artistic development”, or more broadly their symbolic sophistication. Humans are strongly drawn to images and symbols, a propensity that is probably hard-wired into our psyches. We are thus predisposed to privilege those ancient cultures that have left us visually imposing archaeological records, and to downplay or ignore those that have not. For example, there are plenty of films about ancient Egypt, but try to find good ones about ancient Sumer (before 2300 BC), whose weathered lumps of mud architecture and less than monumental art aren’t very visually compelling. When sets of images and symbols cohere as larger systems (writing, mathematics, calendars, etc.) we are even more impressed. One reason why the Classic Maya are much better known than their Teotihuacano patrons is that Teotihuacan art, heavily expressed in the form of wall murals, has not survived well, and what remains does not easily resolve itself into messages meaningful to us. Without doubt the Classic Maya left us one of the most flamboyant archaeological records of durable and intelligible images and symbols found anywhere, carved and painted on everything from bones to buildings. The intellectual mastery that we deduce from all this material, along with specific kinds of information it conveys, are principal reasons why the Maya are so famous and so interesting to us.

Here again we might be fooled. I believe we are overly inclined to equate artistic and symbolic sophistication with institutional complexity and sociopolitical scale. A little reflection, of course, tells us that small and comparatively simple cultures sometimes have extremely rich traditions of art --- the natives of the northwest coast of North America or coastal New Guinea are obvious cases in point. But surely, we imagine, such achievements as Maya mathematics, calendars, and writing must be acknowledged as markers of great sophistication. Let’s take a closer look.

Art itself is a symbolic system, and the 19th century resurrection of the Classic Maya in the western imagination was closely connected with the appreciation of façade sculpture, carved stelae and altars, and other images painted or incised on smaller objects. Many of these images are extremely elegant and imposing, and we now know that they have their own complex “grammar” of meaning. Closely associated with the images are inscriptions and dates.

Perhaps the most famous symbolic systems of the Classic Maya (because they have been understood for a long time) are several kinds of calendars, along with their attendant systems of

mathematical notation and astronomical observations. The Maya employed two fundamental ways of reckoning short cycles of time. Both are very ancient in Mesoamerica, and neither was probably “invented” by the Maya. One calendar was based on the permutation of 18 named months and twenty numbered days which, along with five intercalated “extra” days, yielded a cycle of 365 days, just short of a solar year. The second was a ritual calendar of 260 days based on a similar permutation of 13 numbers and 20 named days (just what, if any, natural cycle it represents is unknown). When these two calendars are meshed together they create a longer cycle of not quite 52 years.

These cycles were not very useful in keeping accurate track of events over long periods because the same dates would confusingly recur sooner or later. Moreover, the 365 day calendar drifts against the true solar year because it is a fraction of a day short, so it is not a good guide to seasons or other yearly events (the Egyptian solar calendar, the source our own via the Romans, had the same defect). Other Mesoamerican people (e.g. the Aztecs) were content with such imprecision, but the Maya perfected a third calendar called the Long Count that allowed them to track time in an essentially linear fashion, so that each day (as in our calendar) has a unique date.²⁰ All these calendars used a system of vigesimal (i.e. 20-based) arithmetical notation that included the sophisticated concepts of “zero” or “place”. Their calendars and mathematical expertise allowed the Maya to track long astronomical cycles, most notably those of the sun and the planet Venus. Scholars understood these calendrical achievements by the beginning of the 20th century, so they contributed greatly to the reputation of the Classic Maya as innovators and intellectuals. What the Maya typically recorded using these calendars, we now know, was the passage of ideologically significant intervals of time that were commemorated by monument dedication, which was in turn linked, almost always retrospectively, to “historical” events in the lives of important people or kingdoms.

Long before we understood Maya calendars, however, what impressed the wider world was that the Maya possessed books. Maya literacy created a sensation among European intellectuals in the early 16th century, despite the fact that their books could not be read. Of course, most other cultures and societies that Europeans then knew about were literate (or more properly, had literate elites). What seems to have surprised them is that a hitherto unknown and alien people had achieved literacy. From the western point of view literacy eventually became a hallmark of those kinds of societies we call “civilizations”, most notably in the evolutionary schemes of Lewis Henry Morgan (1878). Writing assumed a diagnostic importance out of proportion to other cultural features, and to its own significance. In a word, writing trumps complexity, or, better, is assumed to be a correlate of it: “Writing exists only in a civilization, and a civilization cannot exist without it” (Gelb1963: 12). One could hardly find a more succinct and assertive conflation of a kind of symbolic system with a societal type or evolutionary stage. Why this prejudice should have such a hold on the Western mind is unclear. Romans, Greeks, Egyptians, Chinese, and other impressive cultures to be sure were literate, but the enormous and complex Inka empire was not, as the Spaniards well knew by the mid-15th century; and of course historians and ethnographers have since documented many other impressive, but non-literate societies. We seem to be able to grudgingly extend the honorific “civilization” to some non-

²⁰ Unique, at least, within one of the approximately 400 year long cycles that made up the Long Count.

literate people like the Inka, but balk at the converse -- the idea that literate people might have rather simple social and political institutions.

By the 17th century many European scholars regarded the non-literate peoples who were increasingly being encountered in the New World and elsewhere as savages, not least because if they could not read, they could not be enlightened by the Scriptures, and indeed must generally be heathens, cut off from any kind of history or tradition or spiritual awareness:

[They were] naked, vnciuill, some of them deuouers of mans flesh, ignorant of shipping, without all kinde of learning, hauing no remembrance of historie or writing about them: never hauing heard of any such religion as in other places of the world is knowne: but being utterly ignorant of Scripture, & *Christ* or *Moses*, or any God; neither hauing among them any token of crosse, Church, temple, or devotion, agreeing with other nations (John Layfield, about 1610; quoted in Nicholson 2003: 161).

Sixteenth century Maya literacy, of course, was just the end of a long tradition. Centuries earlier the Classic Maya (and indeed their Preclassic forebears), also wrote, although no intact books have survived. Thousands of shorter, more durable inscriptions remain, however, and for a long time it was assumed that the Classic Maya were the inventors of Mesoamerican writing. Although this is not true, they did develop a logosyllabic system that was more sophisticated than any other ever used in Mesoamerica. Unlike the Aztecs, they could probably write down just about anything they could say, so writing was directly linked to speech – or at least a kind of speech. Written Maya took the form of an archaic language, one no longer actively spoken as a vernacular, rather like Latin in medieval Europe (Houston et al. 2000).

We have only been able to read the inscriptions with any facility since about 1980, a century after Maya archaeology began. Many reconstructions of Classic society were thus made long before there was any complementary evidence from the glyphs, so one could imagine many odd things about the Maya, such as their lack of kings and wars. Consider, by contrast, what happened in Egypt. Hieroglyphs could be read as early as 1822, so that subsequent Egyptian archaeology developed in the penumbra of history, and similar fanciful interpretations of the archaeological record were constrained. Once Maya inscriptions could be read, it was as if, one of my colleagues remarked, an ancient “time capsule” had been opened, with messages directly from them to us. Suddenly the Maya seemed much more like other ancient civilizations – kings, wars, and all.

Because the inscriptions are often closely associated with calendrical notations, they provide us with a sort of history of people, places and events. I say “sort of” because there are many gaps and there is abundant evidence that this “historical” record was manipulated for political and ritual purposes. Most recorded events are retrospective -- often deeply so -- creating the opportunity to manipulate and accommodate them to the needs the patrons who commissioned the inscriptions. For example, one early and very famous “star war” military event that occurred in AD 562 between Tikal and Caracol is known only through an inscription made 70 years later.

However valuable they are as history, Maya inscriptions unfortunately reveal a very narrow set of concerns. Kings, their relatives, and lesser lords recorded details about their life cycles (birth,

accession, death), their gods and rituals, their ancestors, their titles, their alliances, toponyms, and their wars (and there is plenty about war). Moreover, the nature of the media that convey glyphs means that messages are very short, ranging from a handful to a few score glyphs (there are rare exceptions, such as the Hieroglyphic Stairway at Copan, with some 2000 glyphs), and they accordingly convey comparatively little information to us. But what about more utilitarian uses? Did a Classic Maya king ever write a message to an ally that said something like “Meet me at the edge of the river on July 25 with a force of 1000 warriors”? Were there account books that kept track of taxes received or labor mobilized for royal projects? We simply do not know.

Of course the earliest writing in some other ancient civilizations was also restricted to narrow topics, such as royal affairs (Egypt) and the economic administration of temples and estates (Sumer). Nevertheless, records in both these traditions provide us with detailed insights concerning the structure of officialdom, decision-making, and complex economic behavior (e.g., the many official ranks and titles of Early Dynastic Egypt, or the “Standard Professions List” of Uruk period Sumer). Should we regard Maya inscriptions as symptomatic of similarly complex political, bureaucratic, or economic institutions? The answer of those who have the “state” or “civilization” yearnings posited by Yoffee is a definite “Yes”, but in all honesty we do not know this either. I think we must seriously entertain the possibility that in the Classic Maya case the intellectually brilliant elaboration of writing, calendars, mathematics, and art might be decoupled from institutional complexity.

The Basic Institutions of the Ancient Maya

The nature of institutions is, in my opinion the critical issue, a point made by many other participants in the conference. With regard to the Classic Maya we are in poorly known and controversial territory, especially because their 16th century descendants serve as such questionable models.

Kingship: We have good archaeological and epigraphic evidence for only two basic institutions -- kingship and the household. At the highest level, we all agree that there were many kings and polities at any given time. Although not usually themselves worshipped as deities, living kings possessed extraordinary connections with gods, ancestors, and other supernatural forces and were personally charged with spiritual potency. Succession to the royal office was mainly in the male line, but apparently not through rigidly prescribed relationships (e.g., father to son). Instead, there was a concern with reserving the office of king to a particular ruling patriline, within which brothers or other male consanguines were eligible (the Aztecs had a similar system). Because kings were probably polygynous, there would often have been numerous candidates.²¹ Such an inheritance pattern betrays the importance of the ancestry (sometimes mythical) of the line’s founders, and probably also the desire to keep the entitlements of each royal house from being dissipated. When suitable male heirs were not available, women acted as regents or occasionally rulers, and the royal title descended to their sons, a kind of flexible

²¹ The glyphs say nothing directly about marriage patterns, which must be read between the lines in inscriptions that associate particular royal men and women and (sometimes) children. The best inferential evidence for polygyny comes from the dynastic inscriptions at Yaxchilan where women who were royal wives or consorts were contemporaries. My opinion is that elite Maya men, and certainly kings, were polygynous.

accommodation that kept succession close to a central line of descent.²² Several dramatic archaeological finds of “massacre deposits” suggest that entire elite or royal families were sometimes eliminated by violence during Late Classic wars (Massey and Steele 1997; Gugliotta 2007).

Despite the veneer of elite culture that spread widely over the Maya Lowlands in Classic times (and which itself shows significant variation from polity to polity), there was never any effective political centralization that united the region. Great kings, through diplomacy and strategic marriages, pieced together far-flung alliances and coalitions of polities waged long struggles for supremacy. Lesser kings were subordinated by political expediency, ambition, or outright force to greater ones (in the Maya idiom they were “possessed”). Despite such hierarchies, the style of Classic rule everywhere emphasized the local king as the legitimate ruler of his people and the guarantor of well-being through his rituals, which ensured the favor of the gods and ancestors, kept the forces of chaos at bay, and brought bountiful harvests.²³ How these universalistic pretensions played out against the decidedly local political arenas of individual rulers is unknown (Webster 2002a). This tradition, along with a comparatively high resource redundancy, poor transport ability, and fairly simple administrative institutions (see below), helps explain why no single Maya polity ever managed to create a larger, multi-polity system, at least for more than a generation or two.

Courts and Palaces: Because of the heavy focus of art and inscriptions on the affairs of rulers, we know a lot about kings and their courts – courts here understood to be both the people around kings and the facilities – residential, ritual, and administrative – that they used. Palace-focused research has been highly fashionable for the last several decades, and since the 1970s archaeologists have excavated many such places (Inomata and Houston 2001). Palaces represent the convergence of kingship and the household, incorporating as they do all the necessary political, administrative, and ritual apparatus for dynastic rule, in addition to royal residence. These palaces were often very large, constructed of fine masonry, and embellished with sculpture and paintings that celebrated royal rule. In addition to direct archaeological evidence of palaces we have numerous palace scenes, most strikingly painted on polychrome vessels.

Their obvious residential functions aside, we know that royal rituals took place in and around palaces, that diplomats and other important visitors were received there, that they housed god-bundles and other royal paraphernalia, that they served as courts where officials and lords associated with the king, and that gifts and tribute were presented in palace settings. Palaces were also places where artisans, often themselves nobles, produced fine ceramics, sculptures, and other items of high social and ritual value. Nor were palaces restricted to kings. At some centers such as Copan the royal precincts were surrounded with palatial compounds where hundreds of relatives, retainers, artisans, and perhaps slaves served lesser nobles. Sometimes these are

²² Such accommodations are historically commonplace. Prince Charles, the presumptive heir to the British throne, is not descended from the immediate patriline of his mother, but rather that of a more distantly related prince. Nevertheless, if he becomes king he will stress his relationship to his mother’s more exalted descent group and act as the chief custodian of the properties and other entitlements of the Windsor royal house.

²³ Bruce Trigger’s (2003) ambitious comparative studies show that such concerns are practically universal in ancient civilizations.

almost as impressive as royal palaces, boasting their own façade sculpture, carved benches or “thrones”, and altars. Such places reveal not only something about those officials or courtiers who served the king, but also the political fault lines along which discontent and competition might disturb kingdoms from within.

Leaders and Management: Archaeologists all agree that Classic Maya kings and nobles and government were heavily palace/court oriented, but what about the actual mechanics of royal rule? How did these elite people, at most 10% of the population, relate to the rest of society? Granted that there were many Maya kingdoms and that there must have been considerable political variation among them (to a degree correlated with scale and longevity), archaeologists are strongly divided about how Classic Maya societies were politically structured. Some, impressed by the splendor of royal monuments, envision strongly centralized polities dominated by powerful kings and royal bureaucracies. According to this perspective, rulers and their minions closely monitored the affairs of their kingdoms and were effective managers of civic projects, wars, diplomacy, trade, and subsistence economies. Others believe that kings were weak rulers who depended heavily on their charisma and ritual roles, who had nothing resembling complex bureaucracies, and whose managerial roles were very limited. In a word, they were not very state-like. I fall into this latter camp.

Consider, for example, the issue of what rulers “managed”. There is no question that they choreographed and participated in rituals, that they initiated construction projects and mobilized labor for them, that they provided leadership in war, and that they negotiated with their peers in other kingdoms. We do not know, however, whether they directly managed any aspect of the subsistence economy, or trade, or determined policies of taxation. They had around them deputy governors who bore titles like *sajal*, and other officials called *aj k’uhuun*, who in some sense aided or “provided for” the ruler. Whether these functionaries (and others) constituted something we would call a bureaucracy or instead a looser cadre of royal relatives and courtiers is debatable (I suspect the latter). Nor do we know how far any king could challenge his own nobles or allies in the overall management of political policies or events.

Social Relations: More importantly, we do not know how kings and lords related to lesser people. We do agree that commoners probably made up 90% or more of the population.²⁴ We can easily see the spatial arrangements -- ordinary people lived in small households whose remains are sometimes scattered across the landscape (as at Tikal), or alternatively clustered closely around the central temples and palaces (as at Palenque, Piedras Negras, and Copan). These remains are sometimes very modest, on a scale to accommodate nuclear families. Others are bigger, and probably housed extended families of a dozen or more people. Some such households appear to have been more long-lived and often more prosperous than others. But the larger questions remain: were nobles hereditary elites who distinguished themselves from commoners, as among the 16th century Aztecs, or were kinship and other links maintained among people of different social ranks? Were there slaves? Can we properly speak of well-developed social classes? Did common people feel a strong traditional bond with their local rulers and traditions, or was their identification looser, allowing considerable mobility on the

²⁴ Ratios of commoners (producers) to consumers (elites or other non-farmers) were commonly about this great in most ancient agrarian civilizations.

political landscape? We argue about all these things, and will continue to do so because the inscriptions provide no answers.

Maya “Cities”?: Jumping up to a larger scale, one might expect that another well-known component of Maya life would be the “city”, because archaeologists have been systematically excavating big Maya places since the 19th century. As we already saw, all archaeologists agree that the biggest, well-established Maya centers such as Tikal, Copan, or Palenque were political capitals -- the seats of ruling dynasties and their courts. The inscriptions confirm this, and we can often point to particular sets of buildings where this or that king and his family resided. In some regions such as northwestern Guatemala these political capitals were less than a day’s walk apart, yet still autonomous and often in active conflict. Even the two long-standing “superpowers” rivals, Tikal and Calakmul, were only about 5-6 days apart by foot.

Whether the Classic Maya had anything like well-developed urban centers in the Old World sense of the term is hotly debated (Sanders and Webster 1988). Our attitudes toward such places have swung between two poles. Up until the 1960s, before inscriptions could be read, big Classic sites were conceived of as “vacant ceremonial centers”, built and maintained by farmers, who congregated in them for periodic rituals overseen by priests. By the 1980s, when a flood of inscriptions had made it clear that they were the seats of kings, the opinion swung to the interpretation that they were true cities, just like Tenochtitlan, like Teotihuacan, and like Old World cities more generally. Each big Classic center was increasingly envisioned as a “...preindustrial city in function and in most aspects of form except for population density” (Hammond 1975:58). Mayanists proclaimed, with apparent relief, that the burden of Maya uniqueness could be jettisoned, and “.....that the ‘true city’ model brings ancient Maya society into the mainstream of cultural evolution, entailing as it does the institutions of state-level governance, an urban-type economy, and the correlates of a complex class system” (Willey and Hammond 1979: xii). Some have gone so far as to apply modern terms such as “urban sprawl” and “suburbanization” to Maya centers.

The truth lies somewhere between these two poles. I think that big Maya centers were profoundly different from well-developed ancient cities, and certainly from modern ones. Instead, most big Maya sites were “regal-ritual” centers --- the ruling apparatus of a royal dynasty (or a succession of them).²⁵ They are essentially the enormous household facilities of kings, often built over centuries, where the ruler and his family resided, where the royal court was located, and where illustrious ancestors were buried. Lesser nobles and commoners clustered around the margins of such places, but in numbers far smaller and densities far lower than characteristic of well developed cities. Indeed, it is difficult to imagine how a settlement on the scale of the Aztec capital, where roughly 150,000 people (most not farmers) were crowded into a set of islands that covered a scant 12-15 sq km, could have been supplied on a Maya landscape. Many Mayanists find this revisionist viewpoint objectionable -- if Central Mexico and the Old World civilizations had cities, then Tikal and other such places must have been cities too. Just look how big the buildings are! So what if Maya “urban” densities are far lower than at other cities!

²⁵ There are some exceptions. For example Chinchucmil, in northwestern Yucatan, is clearly some sort of special place that departs from this model --- possibly a commercial entrepot.

Markets and Exchange: Symptomatic of this mind-set is the related issue of markets, which are routinely referred to in the literature: “The most important economic institution of the ancient Maya was the centralized market” (Brainerd, Morley, and Sharer 1983: 249).

Markets, both as places and as principles of exchange, are seen by many anthropologists and historians as essential components of urban civilizations (rather like writing). In fact, they were one of the things that most impressed European chroniclers like Hernan Cortes and Bernal Diaz as they first marched through highland Mexico in 1519. If by markets we mean places where people habitually go to exchange minor household food surpluses or simple craft items or services, then they are indeed probably universal among ancient complex cultures. If instead we mean centralized systems of interlinked facilities essential to the wider economy where exchanges of many kinds of things and services – ordinary and extraordinary – take place on a vast and formally institutionalized scale, then they are not universal. Such markets existed in Central Mexico, but no early 16th century Spaniards rhapsodized about big markets among the Maya of Yucatan. Anthropologists frequently assert that well-developed market systems are characteristic of Mesoamerica in general, but there is no good ethnohistoric evidence for them at all from early Spanish accounts of either the highland or northern Maya when they were first encountered. Nor, some arguments to the contrary, has any Maya archaeologist definitively identified big Classic period market facilities or shown that market exchange was critical to local or regional economies.²⁶ Despite the paucity of both historic and archaeological evidence, many archaeologists assert that Classic Maya markets were well-established economic institutions that operated not only locally, but that also were linked to pan-Mesoamerican systems of commerce, with professional merchants and motivations of “supply and demand” and “profit” couched in almost capitalistic terms. Here again the only models many archaeologists seem to find attractive are those that make the Maya seem more like us.

Of course we know that impressive civilizations can operate perfectly well without markets in the hyper-developed sense described above. The highland Inka didn't have them, nor probably, did the Old Kingdom Egyptians who built the pyramids. In defense of ancient Maya markets, some archaeologists point to the many kinds of exotic things that circulated widely among Classic polities, and particularly among their elites. Such finished objects or raw materials are especially retrieved from contexts such as tombs, palaces, and ritual caches. They include pottery, shell, jade, obsidian, and chert, all directly represented in the archaeological record, along with skins, feathers, cotton mantles, chocolate, and other things indirectly inferred from Maya art. Whether these things were commonly redistributed via institutionalized markets or some other exchange mechanism remains unclear. All we usually know is that something from a distant place wound up somewhere else, not how it got there. Most of these things are precisely the light, highly valued objects or materials appropriate to the distinctive Mesoamerican modes of human transport, especially across terrestrial environments. They also are not necessities, in any fundamental energetic or biological sense, so people could do without them (and needless to

²⁶ I might be wrong about this. Murals recently discovered by Mexican archaeologists at Calakmul depict individuals engaged in what might be market exchange. These murals are associated with a large open space with stall-like rooms. Other aspects of the iconography are strange, however, and it remains unclear exactly what is being shown. Calakmul is a huge Classic center, so this might be the proverbial exception that proves the rule. On the other hand, the murals might show something like preparations for a feast or a royal marriage.

say, very little of this stuff wound up in the houses of common people anyway). There are unfortunately very few good estimates of the amount or intensity of exchanges for any kind of material.

Anthropologists are familiar with many ways other than commerce in which things moved about in non-Western, pre-industrial societies. Dowries and bride price, exchanges among relatives or “trade friends” (Hughes 1977), gift-giving at political negotiations, offerings presented during funerals or pilgrimage, and tribute payments are but a few examples (and the Maya are known to have done some of these things). Perhaps the Classic Maya did have big markets, but if so they don’t show up unmistakably in the archaeological record, and we might as well be candid and admit that we don’t know. Given the paucity of evidence and the lack of references to large 16th century markets, I remain a skeptic about their presence. And here numbers do matter; really dense urban populations stimulate market demand and its close correlate, occupational specialization. I think that Classic Maya economies generally lacked anything like big Aztec markets, comparable levels of specialized craft production, and that motivation for the long-distance movement of goods was probably not very “profit-motivated” by any modern standards.

Only two basic commodities are known (or reasonably assumed) to have been routinely exchanged over long distances and used by people of all ranks. The first is obsidian, a volcanic glass used to make cutting tools, and the second is salt (which can, of course, be considered a biological necessity). Obsidian, usually in the form of prismatic blades, was widely moved across Maya landscapes and is routinely found in both elite and commoner contexts. It originated in quarries in the highlands of Guatemala, Honduras, and (very occasionally) Mexico. Its distribution in Maya sites is spotty, ranging from thousands of fragments capping elite burials to a handful of blades recovered from rural household sites. I have personally done (or otherwise overseen) numerous household excavations in the Maya Lowlands and obsidian is surprisingly rare, even at sites nearest to the sources. In other words, it was consumed by most people in small quantities that could have been procured through very low intensity exchange mechanisms even using inefficient human transport. Salt might have circulated in greater quantities, but because it does not preserve we cannot easily detect its presence, and certainly not the amounts moved around. These two materials, along with a little chert that has more restricted distributions, are the only non-elite goods that seem to have been widely redistributed in appreciable amounts.

I do have one suspicion about bulk goods and the subsistence economy. The Maya were in a kind of double bind with regard to large transfers of food from one polity or region to another. Imagine that there was a severe shortfall in maize production in one kingdom (because of drought, storm damage, insect pests, or some other crisis) so that the local population was in severe trouble. Their general food deficit could not be made up by inputs from distant places for two reasons. First, farmers elsewhere could not produce sufficiently large surpluses for reasons already discussed. Second, moving corn or beans any distance is enormously inefficient, because the porter “eats up” the energy equivalents of what he is carrying. These constraints are why I think large transfers of basic food resources were always local.

There might be an exception, however, that involved only elites, who comprised 10% or less of the population. Whether kings and lords were sensitive to the plight of starving farmers is

arguable, but they were unquestionably concerned with their own well-being. I suspect that as a result of wars, intermarriage, and complex patterns of inheritance, Late Classic Maya people of rank held rights not only to the products of their local landscapes, but also to distant fields or estates (often in other kingdoms). Such a pattern is seen elsewhere in Mesoamerica. For example, Aztec lords and noble houses owned widely scattered estates (this is sometimes called the “archipelago estate” pattern). Maya palace revenues might have similarly derived from places that were at considerable distances. Movements of maize and beans necessary to keep elite households provisioned would have been possible over distances of 100 km or more, because the total amounts moved were small and the losses politically tolerable (i.e., not a significant drain on the donor region). Long distance food transfers could not bail out whole starving populations, but they certainly might have buffered elites from the uncertainties and risks of agricultural shortfalls. This “I’ve got mine” syndrome might have fostered considerable resentment between Maya elites and commoners, and contributed to the social breakdown that was part of the Maya collapse.

Here the Aztecs offer an interesting parallel. Almost all their maize tribute came from inside the Basin of Mexico (the core region of the empire) or from nearby provinces.²⁷ Exactly how much was demanded each year is unclear, and some fraction of this tribute never reached the Basin, being set aside for local imperial purposes. Even if we assume, however, that all of it was imported into the Basin consumed there, the maximum estimate of Anderson and Barlow (1943) would have fed about 10% of the population. This amounts to roughly the proportion of people residing in the Aztec capital, Tenochtitlan, or more suggestively, the elite population of the region. Some ethnohistoric records suggest that kings (and other elites) only reluctantly opened their grain stores during times of famine, and only in the face of political unrest. Even so, such redistribution could not have gone far to feed the general Aztec population.

Rights to Agrarian Resources: While on this subject it is worthwhile noting our almost total ignorance about an essential issue of Maya agrarian economics: what kinds of claims did people assert over the agricultural landscape and/or its products (or more crudely, what were basic patterns of “ownership”)? Only one thing is clear – elites (or other non-food producers) were supported by the surpluses of farmers. While it is possible to estimate how burdensome (or not) such contributions might have been (see Webster 1985), we know nothing about the “taxation” arrangements that enabled such appropriation. Did kings and elites “own” estates, as suggested above? Could land and labor be redistributed by royal favor to reward warriors or officials? Did common farmers believe they had strong rights to land? Were these rights collective or individual? Were some farmers tenants or even slaves? How were rights to agrarian resources obtained, maintained, and transmitted across generations? Inscriptions offer no answers, and information on these topics is almost impossible to get from the archaeological record. In stark contrast, we know about all of these things for the Aztecs, and we could not otherwise understand the workings of Aztec society or the structure of its institutions. Imagine trying to

²⁷ Aztec rulers could order maize moved much farther and in much greater quantity than feeble Classic Maya kings. Powerful kings, of course, are not overly concerned with efficiency of transport, so their demands could be particularly far-reaching. Market exchange, in any sense that we know it, would have precluded widespread movement of maize. Even had supply and demand determined the “price” of basic commodities in Mesoamerica, and household surpluses were available, peasants would not freely choose to accept the loss involved in carrying their grain great distances.

make sense of European history if we were ignorant about all these things. So fundamental are these questions that if I could be granted just one wish concerning the Classic Maya, it would be the answers to them.

The Classic Maya “Collapse”

All these economic considerations bring us to the biggest issue of them all, at least in the public imagination: the famous “collapse” of the Classic Maya (Webster 2002b). The one thing most people think they know about the Maya is that their civilization came to an abrupt and dramatic end. Warfare was rife, environments were wrecked, cities were abandoned, and whole agricultural landscapes reverted to forest. Gibson’s *Apocalypto* plays (in its crude and garbled way) on this public perception and its implied moral lessons. The Classic Maya have become everyone’s favorite object lesson of demographic, social, and ecological catastrophe. Jared Diamond made good use of them in his book *Collapse*, and the most recent entry the list is Alan Weisman’s 2007 book *The World Without Us*. In fact, ever since the early 19th century, when travelers like Stephens and Catherwood (Stephens 1949) sent back romantic accounts of ruined cities in the forest, the supposed collapse has been the one big fact that always lurks behind research on the Classic Maya, and which always guarantees good press.

Some writers use hyperbole to make the Maya object lesson particularly dramatic, and much more abrupt and all-encompassing than it was. Consider this statement from Weisman’s book: “Beginning in the eighth century AD, within just a hundred years lowland Mayan civilization vanished” (Weisman 2007: 225). Now this is just plain wrong. Even if we measure “collapse” by the old-fashioned yardstick – the cessation of Long Count dates at particular sites – the process lasted from about AD 760-909. Measured in other ways it lasted much longer (or didn’t happen at all) and was enormously varied in its pacing, character, and scale (see, for example, the many regional studies in Demarest and Rice 2004). Weisman also gives the impression that some six million people vanished in a century, with only “scattered remnants of population” remaining. I personally doubt that there were anything like 6 million Maya in the early 8th century. No one knows how many were left by, say 1000 AD, but in many places they amounted to much more than “scattered remnants”. At Copan, resident elites continued on in some fashion until about AD 1000, almost two centuries after the last royal monument was erected, and population wound down over several centuries.

Remember also that there were “mini-collapses” and periods of crisis on the regional and local levels beginning in Preclassic times, and continuing throughout Maya history, right up until the Spaniards arrived. The ancient Maya displayed considerable resilience in recovering from these crises, which they did in many ways. So conspicuous have these vicissitudes become that some of my colleagues prefer either not to use the label “collapse” at all, or to at least see the collapse of the 8th-9th centuries as just a big one among a series of smaller ones. In a way this makes sense. Certainly the Maya of northern Yucatan never collapsed (although there were spectacular local failures there), and preserved an impressive, literate culture right up to the 16th century.²⁸

²⁸ Although they used maize as a staple like the southern Maya, their overall population densities appear to have been lower. This is probably one key to why the northern tradition survived, plagued though it was by some local and very abrupt demographic and political collapses.

Still, something dramatic did happen to the great polities of the southern Maya Lowlands beginning about AD 760. At one center after another kings stopped erecting dated monuments in the old royal fashion, palaces and temples fell into disuse, and populations declined. If our perspective is the whole 130,000 sq km area, the royal demise extended over about 140-150 years, and lasted into the early 10th century -- so it is not a sudden catastrophe as we usually imagine. Some individual kingdoms did fall apart very rapidly, but others, such as Copan, declined much more gradually and some never collapsed at all. Trying to explain all this is difficult for many reasons, including the fact that we don't all agree how Classic Maya society worked and so can't agree on exactly what collapsed. Dozens of explanations have nevertheless been championed for this decline. None by itself is convincing, nor is it ever likely to be. Humans, however, usually prefer simple explanations to complex ones, so the search for the one big cause of the Maya collapse continues unabated.

Some old explanations are easy to reject. The idea that peasants rebelled against the insatiable labor demands of their rulers falls short for two reasons. If such rebellions occurred, one would expect plenty of farmers to survive (and even the resurgence of some new forms of hierarchical society) once the old oppressors were gone. And labor demands as we already saw were much less onerous than once thought. Nor do epidemic diseases seem likely culprits. Smallpox, typhus, cholera, typhoid, measles, and plague all appear to be European introductions (as were endemic diseases such as yellow fever and malaria). If something like the European "Black Death" afflicted the Maya, we would expect extremely rapid and widespread mortality and social disruption, not the protracted and patchy collapse as we now know it. Moreover, large human populations eventually rebound from such epidemics even if it takes a few centuries. Such recovery did not occur in the Maya heartland, which was still practically abandoned when Cortes journeyed through it in 1524-25. Warfare, while admittedly most intense in Late Classic times, eventually produces winners and losers, and however destructive, it is by itself unconvincing as a cause for the collapse. Certainly there are no signs of widespread foreign invasions either.

The favorite "silver bullet" explanation during the last decade or so has been an enormous drought thought to have afflicted the Yucatan Peninsula (and regions far beyond) between AD 800-1000 (Hodell et al. 1995; Peterson and Haug 2005; Gill 2000). I think the evidence for a major drought is increasingly convincing, but that its magnitude and regional effects are not clear. More importantly, such a drought fails to square with known patterns of Maya demographic and political history. For example, the big collapse occurred in the wettest parts of the peninsula, not the much drier north. Some paleoclimatologists try to explain this unconformity by showing that drinking water is more accessible in the north. This, of course, is a false issue. Even if farmers could find drinking water, there would still be insufficient rain to water crops, so their subsistence systems would fail and they would die shortly of starvation anyway. Droughts were a contributing factor to the collapse, certainly, but we have a long way to go to understand their role. Even more recently some geoscientists have speculated that "geomagnetic determinism" might explain not only the big Maya collapse, but some of the smaller ones as well (e.g., Gallet and Genevry 2006). Our fascination with Maya droughts is probably directly related to our own concerns about global warming and climate change.

Much of the research on paleoclimatic events and processes is based on remarkable new methods of analysis. Evidence for droughts, for example, is increasingly detected in ice cores, shifts in oxygen isotope ratios in lakes and seas, and trace element analysis of finely stratified sediments recovered from deep sea basins. Remember the “Law of the Hammer”? (Moore and Keene 1983). It says that whenever we invent powerful scientific tools (the hammers) we must find something to hit them with. Unfortunately the Maya provide everybody’s favorite nail. Associating new scientific insights with the romantic and mysterious “Maya Collapse” is a favorite way to get attention for your research. None of these reductionist explanations, of course, account very well for the highly varied internal process of the collapse(s) as archaeologists know it -- and the more we study it the more complicated it becomes.

The most widely accepted explanations for the Maya collapse are complicated and less dramatic. Archaeologists generally agree that an interlocked set of stresses such as overpopulation, degradation of the agricultural environment, famine, disease, warfare, internal social unrest, climate change, and ideological fatigue increasingly afflicted the Late Classic Maya. In some regions warfare was most important, while erosion and deforestation were more prominent elsewhere, but nowhere did a single cause operate on its own. None of these stresses was new; similar problems contributed to the earlier crises so evident in our record of Maya culture history.

So what made the Maya more vulnerable in Late Classic times? Evolutionary biologists increasingly incorporate “niche construction” or “niche inheritance” into their models (e.g., Laland and Brown, 2006). These are new labels for a process, now seen as widespread in nature, that archaeologists and cultural ecologists have long recognized in human cultural evolution. People, mainly through culture, actively alter (“construct”) and maintain important components of the ecological niches they inhabit and use. Succeeding generations “inherit” these new niche components. Feedback between anthropogenically altered environments and human populations produces new selective stresses which usually stimulate positive adaptive change in the short run, but sometimes have negative effects in the long run. On one level, such stresses select for new genetic patterns. A famous example is genes for absorbing the lactose in milk. These appear to have become widespread in Old World humans only after use of domestic, milk-producing animals had become well-established (Laland and Brown: 97). But in the case of humans, adaptations are usually non-genetic, manifested in cultural behavior. Intensified warfare, for example, might benefit specific populations under conditions of anthropogenically-induced resource shortages, and selection would favor elaboration of weaponry, military organization, and even ideology (see Webster 1975 for a discussion focusing on the Maya).

Human niche construction may be deliberate or unintentional, or a combination of both. There is evidence from several parts of the Maya Lowlands that early swidden farming caused upland soils to erode and collect in or around low-lying moist depressions, or swamps. Early stages of this process probably went unnoticed by farmers, but eventually Maya people began to cultivate these bajo-margin soils and to build retaining features to slow erosion and increase soil moisture, adapting to human-induced landscape changes.

However large Maya regional populations might have been in absolute terms, archaeologists agree that they grew rapidly after AD 600 and then peaked roughly between AD 700 and 850. If

reproductive fitness is our measure of evolutionary success, then the Classic Maya enjoyed remarkable fitness during the several centuries of the Late Classic. During the previous 2000 years, however, their ancestors had altered the ecological niches of the Lowlands. The 8th century Maya inherited a landscape that was much changed, and not for the better. Deforestation and erosion were widespread, soil fertility was diminished, what were once shallow lakes were silted over, wild resources were scarcer, and species diversity was (probably) reduced. There were more local political systems than ever before, and people generally lived under conditions of unprecedented social and political circumscription. Another process that has received insufficient attention is that the agricultural potential of various parts of the landscape became more differentiated and more concentrated (as the swamp-margin example suggests). New patterns of productivity and risk probably exacerbated competition among farmers even within specific polities, as well as on the regional level (and here how claims to land were made is a crucial issue).²⁹ All this made populations and political systems much more vulnerable both to agrarian crises and to intense competition. Kingdoms and populations that in AD 600 might have weathered severe droughts or other stresses could not withstand them under the degraded conditions of the 8th or 9th centuries, nor resolve the intense warfare that also caused much disruption. The whole shaky edifice of Classic society came down, although it was more of a slump than a crash.³⁰

There was unquestionably an ideological component to this great unraveling of culture. Some archaeologists have imagined that the Maya, using their own calendars and a cyclical view of time, predicted their own demise, and that this prediction became a kind of self-fulfilling prophecy. I don't believe this for a moment.³¹ I do think, however, that ancient Maya people were adaptively constrained by many of their own basic cultural postulates, particularly their obsessive focus on maize not just as a food, but as a spiritual or almost mystical substance, and the only "respectable" staple crop. Maize and associated agricultural symbolism pervaded the institution of supernaturally potent kingship from very early times.³² Kings projected themselves as the great guarantors of agrarian prosperity and stability, and manifestly could not deliver on these promises. Many things about the collapse were gradual, but the rejection of kingship and its symbolic correlates – royal monuments, art, burials, palaces, inscriptions – appears to have been everywhere abrupt. Even where Maya populations survived for centuries they did not revive the old royal ways of Classic times.

²⁹ Demographers call this differentiation "variance in well-being (see Wood 1998). Too much variance produces stress in social systems -- witness the increasing problems with wealth differentiation in the United States.

³⁰ I think that the big mystery here is not why the Maya collapsed, but why some sort of recovery never took place in the southern Maya Lowlands.

³¹ Although I do think that prophecy, which the Maya have historically used in the face of crisis and oppression, probably played a big part in undermining royal institutions from the bottom up as conditions worsened.

³² See, for example, the recently discovered murals at San Bartolo, Guatemala, which date to Late Preclassic times (Saturno et. al. 2005).

Lest I be misunderstood, I am making here a materialist argument in which ideology is the dependent variable. As the late Stephen Jay Gould insisted in many publications, evolution must incorporate “history” – that is, specific characters of particular phylogenetic lines accumulate through time. Humans of course inherit genes, but also traditions of culture that prevent, constrain, or retard subsequent change. Maize, for the Maya, had for so long been such a superior and productive crop (i.e., so adaptively significant in fitness terms) that it affected all other aspects of life, including world view and rulership. This feedback, I think, eventually constrained flexibility in the face of unanticipated stresses, an “adaptive lag” that eventually proved fatal to their kingdoms.³³ A very similar entanglement of cultural values, politics, and institutions with a single staple crop – rice – exists in eastern and southern Asia (see the many examples cited in Hamilton 2003). We ourselves are increasingly caught up in the negative effects of our own cherished (and usually unquestioned) assumptions --for example, that energy will always be cheap and that technological innovation will solve problems and provide opportunities. The big lesson here is that we should critically examine our own cultural postulates, because the world does not necessarily work the way we imagine it does, nor does it owe us anything – especially predictability or prosperity. The epigrapher David Stuart once remarked that the whole Late Classic period was a rehearsal for the Maya collapse, and I think he was right. A time of unprecedented population growth, powerful rulers, huge centers and buildings, fine art, and intellectual creativity masked an impending crisis on a scale that the Maya had never experienced before.

Imagine a historical question like “What caused World War I”? We don’t expect a nice, neat explanation for such a complicated event. Yet the public (and apparently some scientists) imagine that we will find just such an answer for the Maya collapse, a complex process that happened 1300 years ago, over many decades, among people unlike us who barely left an historical record. Given our propensity to see our own fears reflected back at us by the Maya, and to use them for our own purposes, do we really want an answer?

SUMMARY

What we don’t know about the Classic Maya is a lot. This is why they fascinate us, and why they are useful to us. Since we began to rediscover them in the mid-19th century the Maya have been shape-shifters -- peaceful or warlike, ruled by benevolent priests or by ambitious kings, skilled tropical ecologists or great despoilers of landscapes. We can imagine them as strange and exotic, and at the same time like other ancient civilizations, or even like us. Decipherment of the inscriptions and a great deal of sophisticated archaeology done over the last 40 years have begun to pin them down, so we can no longer bend them into any forms agreeable to us. Nevertheless, there remain many gaps in our knowledge that make them still seem enigmatic and romantic, and that we can fill up as our imaginations dictate.

Readers by now know that I don’t think the Maya were quite as wonderful as many would like to believe. My comments above tend to demote them, and run counter to the “weren’t the Maya numerous, exotic, accomplished, and romantic” image that archaeology commonly purveys and

³³ Think of the cultural lag (still present in many quarters) between our own scientific prediction and documentation of global warming, and the widespread acceptance that it is happening and that we should do something about it.

that the public eagerly absorbs. One might of course object that I'm showing my own biases here -- but at least they have the virtue of being uncommon ones.

Already on our cultural horizon is the next big abuse of the Classic Maya -- predictions of Doomsday. Archaeologists have long known that the current big cycle in the Long Count Calendar (called the 13th *baktun*, an interval of about 400 years) will end on December 21, 2012, a date that the wider world has recently discovered. Google 2012 and the word "Maya" into the search engine of your computer (I've recently examined two books found this way) and you will be flooded with predictions -- one set promising a sudden rebirth of human spirituality or, in a more sinister vein, the end of the world, or at least of civilization. This momentous date has purportedly been found in the Chinese *I Ching*, the Book of Revelations, the "medieval predictions of Merlin" (whatever those are), and many other prophetic works. Malevolent alignments of planets and stars are said to coincide with it. Web sites, books, television documentaries, and movies like *Apocalypto* are sensationalizing the impending event, and the crescendo will intensify over the next few years. The Maya, of course, would simply have begun another cycle, just as they did before, and their world would have gone on. Here's my prediction: 2012 will come and go without the world falling apart (at least any faster than it is at present), and people will forget about this particular intrusion of the ancient Maya into our lives. Nevertheless, long after 2012 we will still be fascinated with the Classic Maya. We will continue to use and abuse them for our own purposes, and see our own fate as somehow linked with their own. Each generation gets the Maya it deserves, or thinks it wants.

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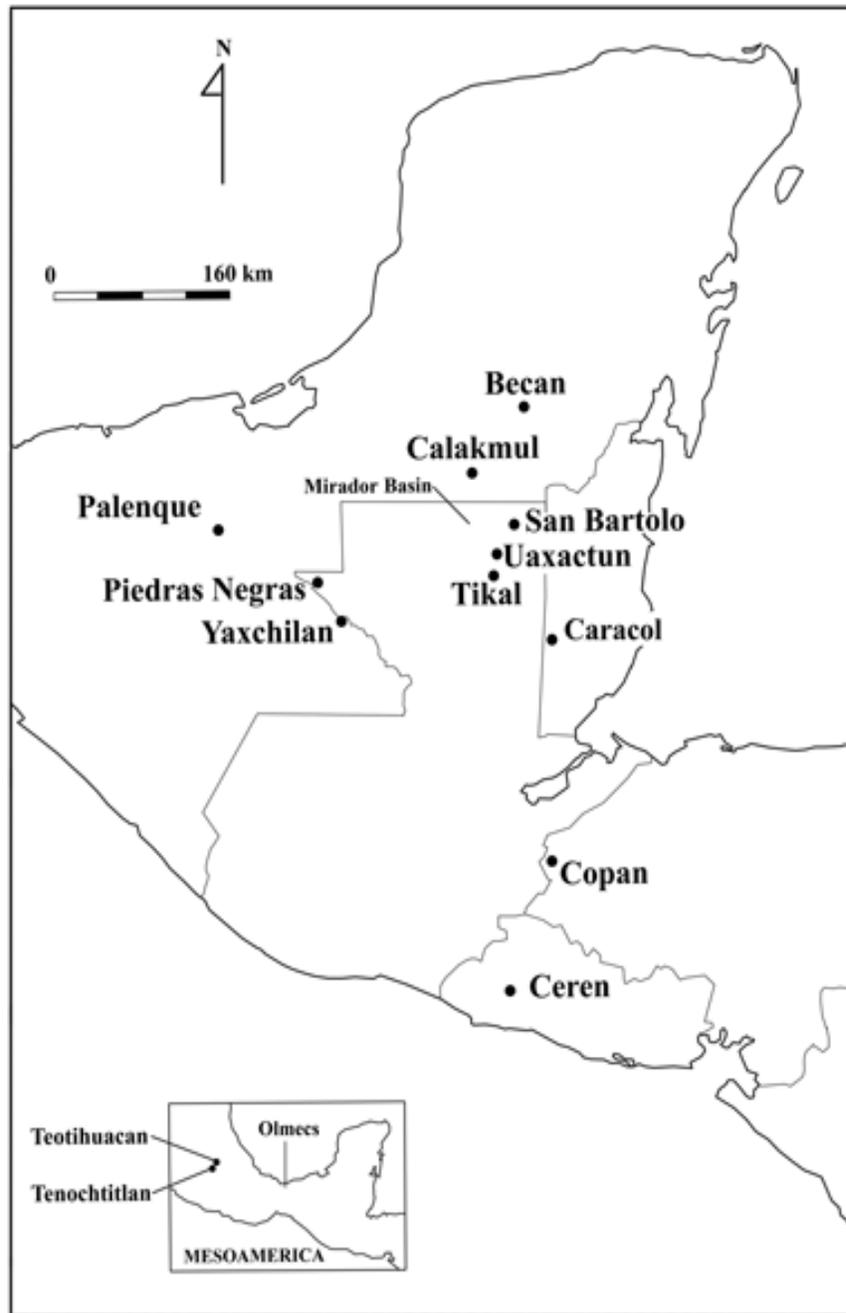


Figure 1: Sites and regions mentioned in the text.

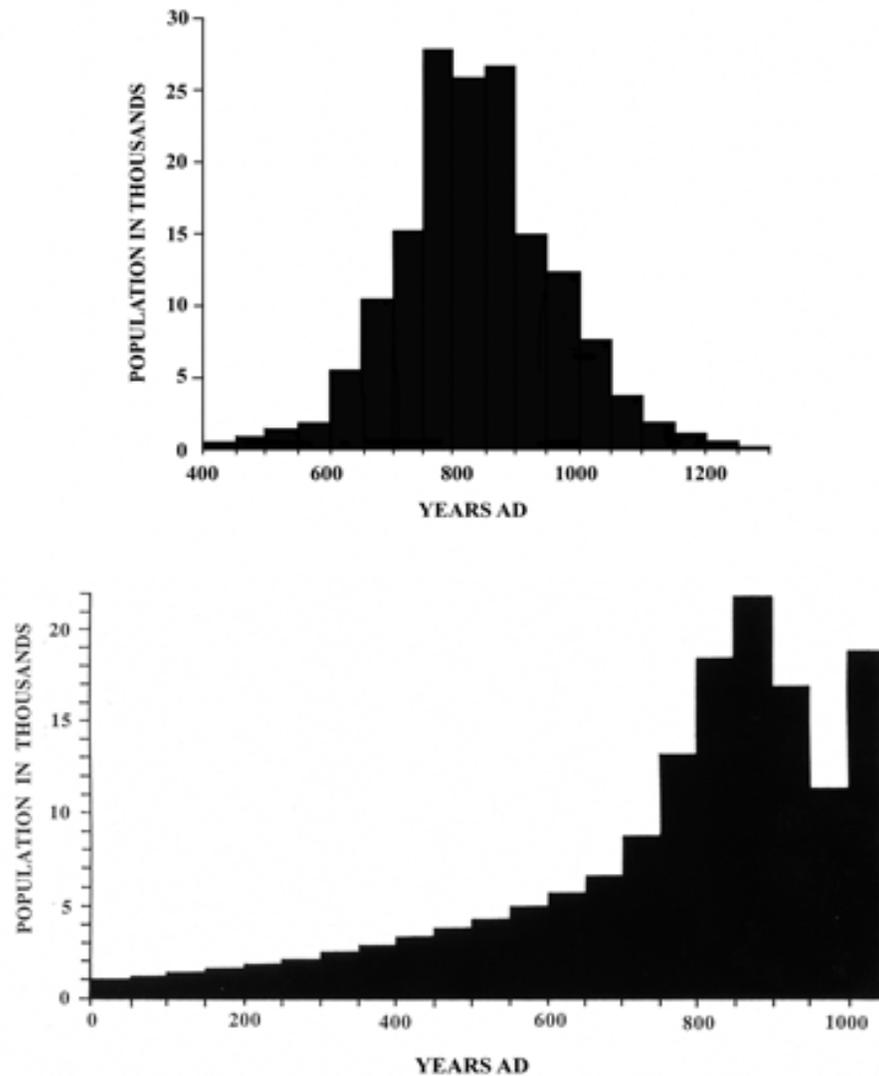


Fig. 2: Two independent simulations of Copan population, one from settlement data (top) and the second based on agricultural productivity (bottom) yield very similar results. Both calculate maximum estimates, and both place peak population in the 22,000-28,000 range. The agricultural simulation is believed to be the more accurate of the two. The sudden jump in population it shows after AD 1000 did not occur; it represents the assumption in the simulation that much of the landscape had recovered its fertility by this time.