

## The Rise and Fall of Market Exchange: A Dynamic Approach to Ancient Maya Economy

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Archaeology is the study of change. The most common metaphor for change that is used to describe social process is evolution. Too often, the specific metaphor of speciation is employed. But speciation is an irreversible process; once a significant change in organization or form has occurred, a return to the previous state is virtually impossible. Another potential metaphor, drawn from thermodynamics, allows for both reversible and irreversible change. The Dynamic Model of archaic states, proposed by Joyce Marcus (1992, 1993, 1998), is an example of a model that is more thermodynamic than evolutionary in the sense that change from one political type to another is reversible.

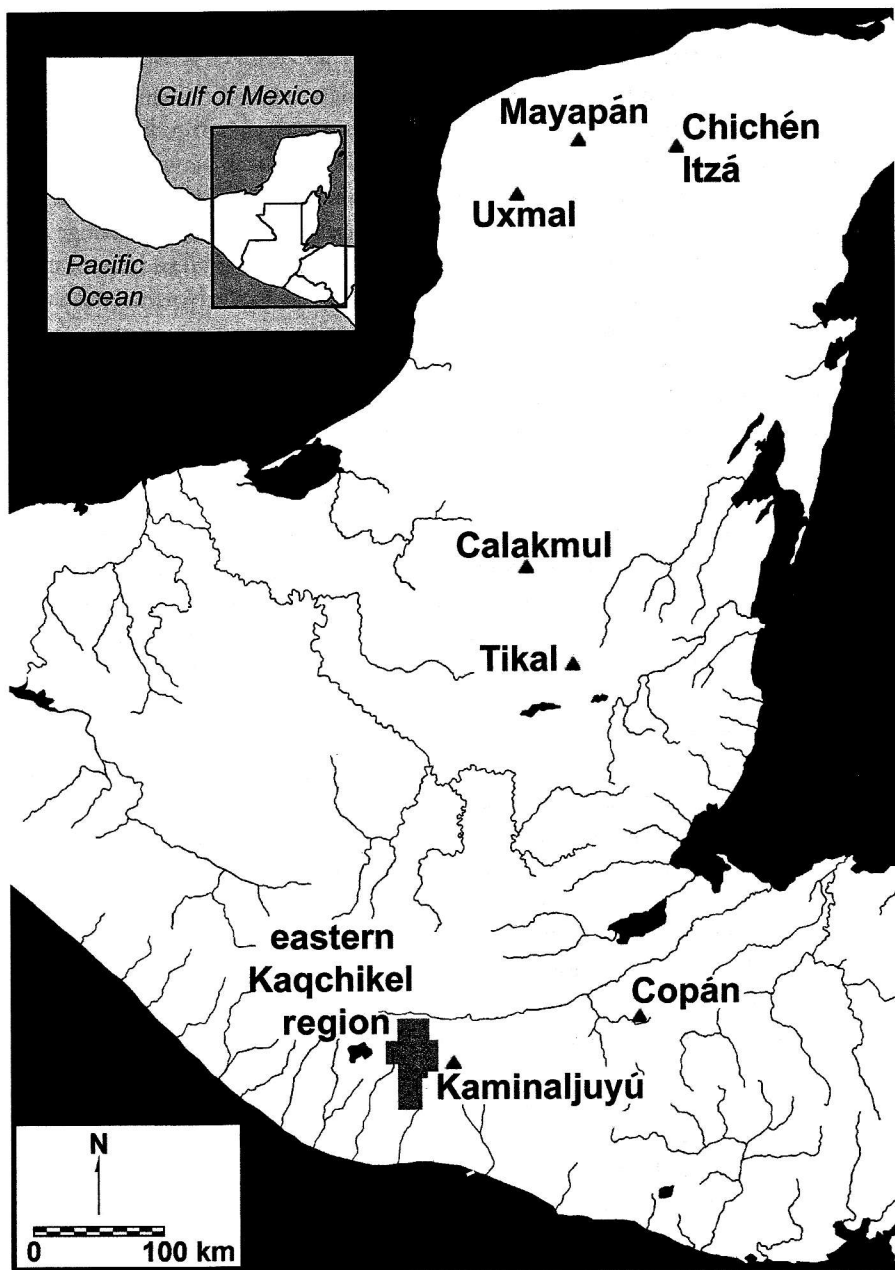
Using ethnohistorical data from Ralph Roys's (1957) work on Mayapán, Marcus depicts Maya polities as dynamic rather than static and as growing and fragmenting in a cyclical fashion. Maya states, according to Marcus's Dynamic Model, coalesced when a province governed by a *halach uinic* ("true man") annexed formerly independent provinces and incorporated their political hierarchies into that of the core. These polities might have been highly centralized, but the degree to which expansion was manifested by true incorporation or by more general hegemonic control is unclear. As the cycle declined, provinces regained their independence or formed loosely allied confederacies. These independent provinces and confederacies were decentralized. Finally, the cycle began again as an independent province absorbed the territories and administrative hierarchies of its neighbors. Marcus stresses three important aspects of her model: (1) the state-like characteristics of small, independent

polities are a result of emulation of the political cores to which they once were linked; (2) regional provinces, rather than states, are the largest stable units of political organization; and (3) throughout most of the cycle, innovation and change are more likely to occur in peripheral provinces than in the core (Lightfoot and Martinez 1995).

In this chapter I argue that economic complexity rises and falls in a cyclical manner like archaic states. Just as political systems are dynamic, so, too, are economic ones. Moreover, two critical points of change in the organization of economic systems determine their size. The less complex (or first) change point occurs when economic systems become restricted by political concerns (Blanton 1976:259–261). That is, large, decentralized, and open systems become smaller, bounded, and hierarchically controlled by elites. The more complex (or second) change point occurs when economic systems significantly outgrow the size of the polity. I argue that no form of market economy can exist below the first change point, that is, when political structure is so simple that there can be no attempt to control the means of either production or exchange. But markets, broadly defined to include both partially and highly commercialized systems, may be said to exist on both sides of the second change point. Just as Marcus defines the regional province as the largest stable unit of political organization, it is the administered market—one governed by the political concerns of medium-scale polities—that is the stable form from and to which larger, more complex competitive markets may cycle.

Christopher Garraty (Chapter 1) describes our mutual project as having four goals: (1) identifying the characteristics of market systems, (2) recognizing market exchange in the archaeological record, (3) interpreting the relation between economic and political systems, and (4) understanding something about the origin and evolution of market systems. In this chapter I consider all four of these issues. I rely heavily on Carol Smith's (1976a, 1976b) models that describe the spatial characteristics of five different types of economic systems. I employ Kenneth Hirth's (1998) archaeological correlates for recognizing different kinds of exchange in the archaeological record but add another diacritic borrowed from Smith: the boundedness of the regional economic system. I interject comments about the relationship between economic and political cycles in my conclusion and also stress that the cyclical emergence of market systems is a developmental process more analogous to changes in thermodynamic state than to evolutionary speciation.

The data I consider are derived from analyses of obsidian artifacts recovered from sites in Guatemala, Honduras, and Mexico (Figure 6.1). I analyze these data from a regional perspective but because, unfortunately, most of the information I have comes only from the centers of capital cities and other major sites, I cannot employ methodologies similar to those used by Barbara Stark and Alanna Ossa (Chapter 5) or by Leah Minc (2006).



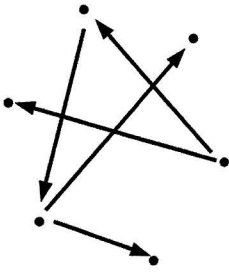
6.1. Maya sites and regions discussed in this chapter.

## SPATIAL AND ARCHAEOLOGICAL CORRELATES OF MARKET EXCHANGE AND OTHER TYPES OF DISTRIBUTION

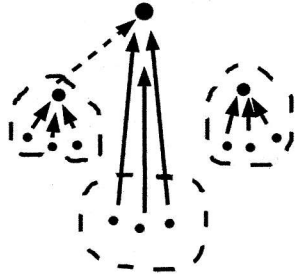
Following other substantivist economic anthropologists, Carol Smith (1976a:314, 321, 334–335, 353) argues that there are three fundamental types of exchange: dyadic, polyadic, and market exchange. Dyadic exchange is direct trade between two equal-status individuals. The long-distance trade of the Kula ring and the gift giving of jade between Classic Maya kings are examples of dyadic exchange. Polyadic exchange may or may not be direct and takes place between a high-status individual and one or more subordinates. The redistribution of blankets by chiefs in the Pacific Northwest is a classic example of polyadic exchange. The spatial organization of economic systems based on dyadic exchange is open and resembles a large, decentralized network connecting more or less equal nodes (Figure 6.2a). In contrast, distribution systems in which polyadic exchange is dominant are bounded, relatively small in size, and hierarchically ordered around the central hub of the chief and the chiefly village (Figure 6.2b).

Market exchange is more complex, and the relationship between producer and consumer is most often mediated by merchants or other middlemen. Carol Smith (1976b) has identified three distinct kinds of market exchange. The first, administered market exchange, implies the control of commerce by political concerns. In contrast, monopolistic market exchange—a concept I do not employ in this chapter—entails the domination of political concerns by commerce. The difference between administered and monopolistic market exchange lies in where and how the elite regulate the circulation of goods and extract surplus and where market forces govern the value of a commodity.<sup>1</sup> Because both market forces and elite manipulation determine value, such systems are only partially commercialized. In administered market exchange, rural producers compete to supply a relatively small class of middlemen. In other words, market forces determine wholesale value. Elite administrators control the economy by regulating middlemen, such as merchants or artisans, rather than the large rural population. Surplus is extracted through the exertion of political control proscribing who, when, where, what, and how much trade takes place. Thus, retailing is the focus of elite control.

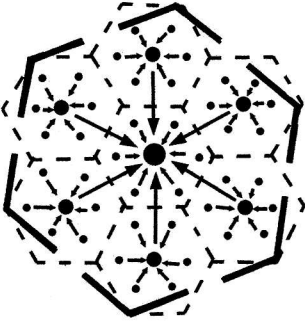
In monopolistic exchange, on the other hand, the relationship between rural producers and middlemen is regulated by the elite, and retailing follows market principles. Colonialist extractive economies are classic examples of monopolistic market exchange. Administered market systems are bounded and defined by a rigid pyramidal hierarchy of nodes and hubs because elites maintain control by manipulating retail value (Figure 6.2c). Because such economies have a single price-setting hub at their political center, Carol Smith calls them solar central-place systems. In contrast, monopolistic market systems may be much larger and are focused on a dominant hub outside the regional system (Figure 6.2d). Smith calls such colonial organizations dendritic central-place systems because of their structure. An important aspect of these systems is that, from the perspective of the periphery, a region may be open to long-distance exchange yet closed to interregional interaction. Consider in modern



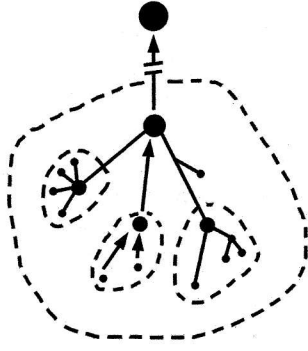
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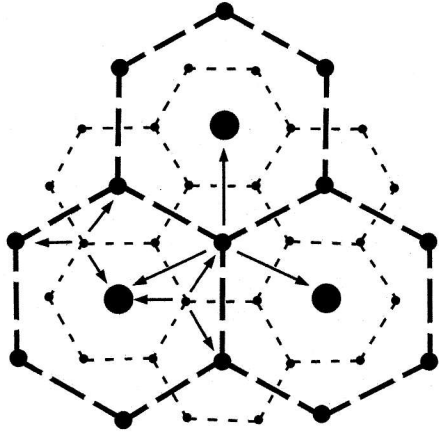
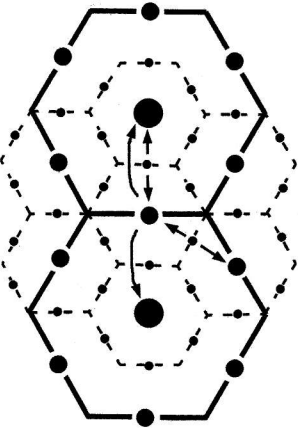
b.



c.



d.



e.

6.2. Carol Smith's (1976b) ideal spatial models of different kinds of exchange: (a) extended network, (b) bounded network, (c) solar central-place system, (d) dendritic central-place system, (e) two forms of interlocking central-place systems.

Table 6.1. Kenneth G. Hirth's (1998) Archaeological Correlates for Different Types of Exchange.

Dyadic Exchange	(1) Geological sources represented at a given household mirror sources at production locus. (2) Households show different procurement patterns if they obtain material from different production loci.
Polyadic Exchange	(1) Elite households have greatest quantity of obsidian and perhaps diversity of sources. (2) "Trickle down" of quantity and source diversity is related to social hierarchy.
Market Exchange	(1) Quantity at households is related to need rather than status. (2) Market homogenizes sources are represented at the community level.

Belize the presence of both Land Rovers and Guinness stout (produced or licensed by companies based within the historical bounds of the British empire) but the near absence of Volkswagen sedans (made in Mexico) and Gallo beer (bottled in nearby Guatemala) as examples of openness to some long-distance exchange yet boundedness to interregional interaction.

The final type is competitive market exchange, where market forces of supply and demand determine both the wholesale and retail value of goods. Such systems are open and have a complex interlocking structure of nodes and hyper-connected hubs; the interlocking structure promotes market rather than political forces as the principal value-setting mechanisms on both the wholesale and retail levels. Such fully commercialized systems are open and may encompass vast territories (Figure 6.2e).

Hirth (1998) and, more recently, Minc (2006) have provided archaeological correlates to different kinds of exchange. To Hirth's correlates I add Carol Smith's observations about open and bounded systems (Table 6.1). Distribution systems characterized by dyadic exchange are open; those in which polyadic redistribution is the determining practice are closed. Systems in which administered market exchange is the norm are also closed and have boundaries that approximate those of the polity, while monopolistic market distribution creates systems that are open to long-distance interaction but not necessarily to interregional exchange. Finally, interlocking distribution systems characterized by fully commercialized market exchange are open and very large.

I turn now to obsidian exchange in the Maya region and look for the archaeological signatures of each type of distribution system. My argument draws upon research conducted at Preclassic-period (ca. 1000/800 BC–AD 150) sites in the highlands of Guatemala, Classic-period (ca. AD 200–800) sites in the central Maya lowlands and southeastern periphery, and Terminal Classic to Postclassic (ca. AD 800–1520) sites in the northern Maya lowlands (Figure 6.1).

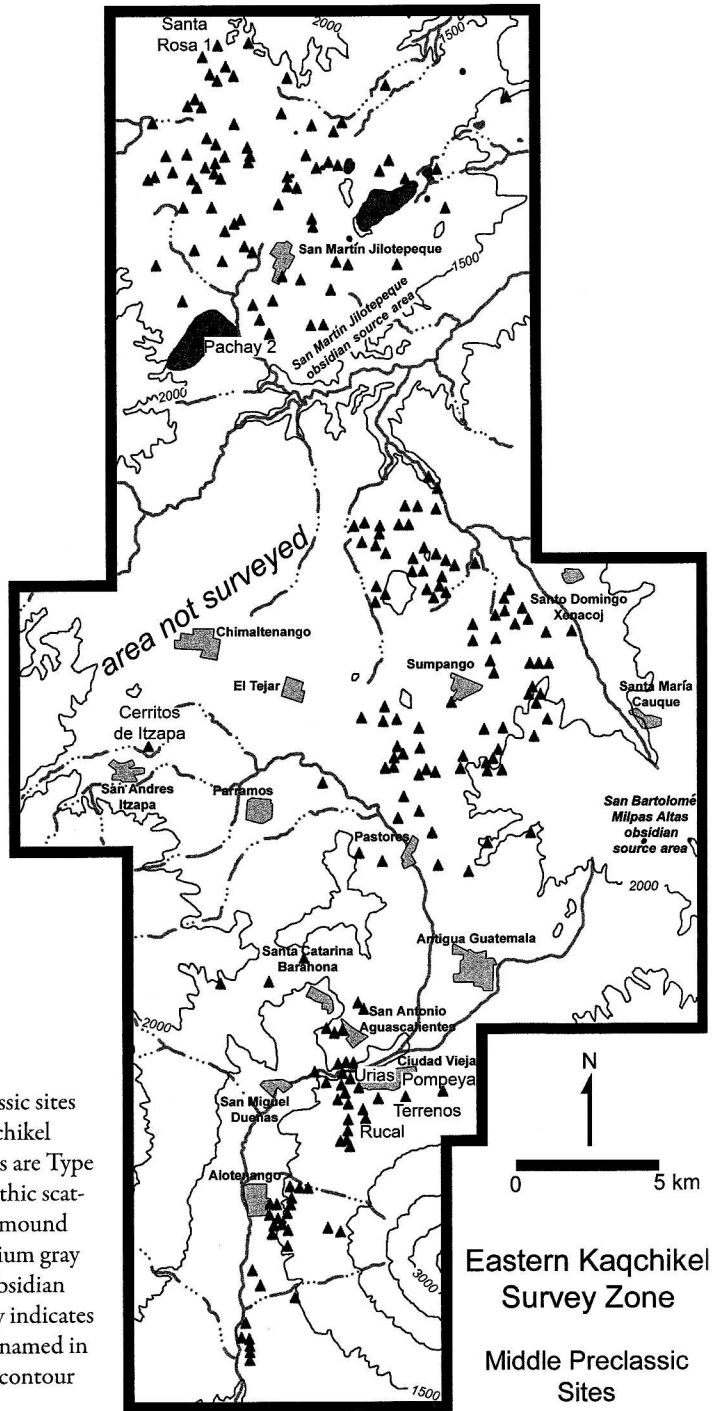
### PRECLASSIC OBSIDIAN DISTRIBUTION SYSTEMS

The first region considered is the central highlands of Guatemala, an area with two important obsidian sources (El Chayal and San Martín Jilotepeque) and a third

minor source (San Bartolomé Milpas Altas). Since the late 1980s, Eugenia Robinson (1990, 1993, 1994, 1998; Robinson et al. 2002) and I (Braswell 1993, 1996a, 1996b, 1998, 2002; Braswell and Robinson in press) have conducted various survey and excavation projects in the eastern Kaqchikel region, west of modern Guatemala City (Figure 6.3). I call the region after the Mayan language spoken in the area by modern inhabitants. Robinson and I have surveyed a total area of about 400 km<sup>2</sup> and located approximately 600 sites. During both the Middle and Late Preclassic periods, the settlement hierarchy of this vast region consisted of just one level: the small agricultural hamlet or village. There is no evidence of social stratification; all structures were made of perishable materials, and we have yet to find any evidence of unequal access to goods. Exchange within the eastern Kaqchikel region was dyadic and organized as an unbounded extended network. In fact, during the early Middle Preclassic period the quantity of obsidian from both the El Chayal and San Martín Jilotepeque sources found at sites in the eastern Kaqchikel region is directly proportional to the distance to each of those sources, a falloff pattern consistent with unbounded exchange (Renfrew 1977:72).

Analysis of obsidian artifacts collected at Kaminaljuyú-Miraflores II by Marion Popenoe de Hatch and Juan Antonio Valdés reveals a somewhat different pattern (Amador and Braswell 1999). The Preclassic center of Kaminaljuyú is located between the Kaqchikel region and the El Chayal obsidian source. During the second half of the Middle Preclassic period, the relative proportion of obsidian from the El Chayal source that reached the eastern Kaqchikel region decreased. Moreover, the relative proportion of San Martín Jilotepeque obsidian at Kaminaljuyú also dramatically decreased. Similarly, ceramics in these two adjoining regions began to diverge; in particular, many new and different pottery types appeared at Kaminaljuyú (Popenoe de Hatch 1997). The boundary between the eastern Kaqchikel region and the Kaminaljuyú distribution system that emerged around 600 BC is sharp and well defined, corresponding more or less to Cerro Alux and the pass between the Valley of Guatemala and modern San Lucas Sacatepéquez. In short, a Kaminaljuyú-centric distribution system with a firm western boundary developed in the second half of the Middle Preclassic, at a time when a chiefdom emerged at the site.

In contrast, a very simple settlement hierarchy and extended distribution system persisted in the Kaqchikel highlands until, as I have argued, the beginning of the Early Classic period (Braswell 1996a). A reasonable interpretation is that during the Middle Preclassic period, a bounded network system of the sort in which polyadic exchange is dominant emerged at Kaminaljuyú. This is why little El Chayal obsidian circulated in the Maya region before the Late Preclassic; the economy of late Middle Classic Kaminaljuyú was closed. In contrast, the open network system of the Preclassic eastern Kaqchikel region was predicated on dyadic exchange. For this reason, and even though the economy of the eastern Kaqchikel region was less complex than that of Middle Preclassic Kaminaljuyú, obsidian from San Martín Jilotepeque was circulated (albeit in relatively small amounts) throughout the Maya area. But at this early time



6.3. Middle Preclassic sites of the eastern Kaqchikel highlands: triangles are Type I sites (sherd and lithic scatters lacking visible mound architecture), medium gray indicates natural obsidian outcrops, light gray indicates modern *cabeceras* (named in bold roman type), contour interval is 500 m.



I see no evidence for any sort of market exchange in either the Kaminaljuyú polity or the eastern Kaqchikel region.

The development of a bounded network system at Kaminaljuyú in the second half of the Middle Preclassic period was preceded by earlier developments in Soconusco, a region that imported much of its obsidian from the central highlands of Guatemala. For Paso de la Amada, Richard Lesure (1995) and Lesure and Michael Blake (2002) have argued that there is little evidence of differential access to imported obsidian during the Early Preclassic period (John E. Clark, in his review of this chapter, strongly disagrees with their position). For Lesure and Blake, then, the relationship between political power and economic advantage was limited until the beginning of the Middle Formative, when Soconusco experienced a great reorganization in settlement patterns and political organization. A hypothesis for further testing is that the emergence of a bounded network system at Kaminaljuyú (but not in the eastern Kaqchikel region) was stimulated by interaction with complex Middle Preclassic chiefdoms in Soconusco, such as La Blanca.

### **OBSIDIAN DISTRIBUTION IN THE CENTRAL LOWLANDS AND THE SOUTHEASTERN PERIPHERY DURING THE CLASSIC PERIOD**

Calakmul and Tikal (Figure 6.1) were certainly the most politically influential states of the central Maya lowlands during the Classic period. Hattula Moholy-Nagy (1994, 1997, 2003) has described the excavation of literally millions of obsidian artifacts at Tikal by the University of Pennsylvania project. Edwin Shook (personal communication, 1994), director of that project, once told me “there was so much obsidian and we had no idea it would ever tell us anything, so we only collected it from important primary contexts and discarded all the rest.”

In contrast to Tikal, two recent projects at Calakmul excavated only hundreds of artifacts (Braswell et al. 2004). Just 515 obsidian artifacts were excavated and recovered by the Universidad Autónoma de Campeche Proyecto Calakmul, directed by William Folan. Moreover, from 1993 to 1995, the Instituto Nacional de Antropología e Historia project directed by Ramón Carrasco recovered only 126 obsidian artifacts. In fact, much more jade than obsidian has been found at Calakmul. There are certainly differences in the intensity of archaeological investigations at Calakmul and Tikal, as well as in methods of collection and in the contexts chosen for excavation. Moreover, Calakmul is 90 km more distant from the Guatemalan obsidian sources than is Tikal. Nonetheless, these factors cannot account for the discrepancy of three to four orders of magnitude between the amount of obsidian found at Tikal compared with Calakmul. It seems highly likely, then, that the Tikal polity prevented obsidian from going to Calakmul. This suggests a regionally bounded economy in which obsidian was subject to redistributive or administered market distribution but not to fully commercialized exchange.

Kazuo Aoyama (1999) and I have independently analyzed obsidian artifacts excavated from the Copán kingdom of western Honduras (Figure 6.1). My own work

has consisted of the analysis of approximately 28,515 obsidian artifacts from the royal residential group of the last Copán ruler of the Classic period and 2,526 pieces from excavations conducted in an adjacent portion of the site called El Bosque. These excavations were conducted at or just south of the site epicenter, so they tell us very little about obsidian distribution and consumption by non-elites who lived outside the palace complex. One important observation made from these data, however, is that during the Classic period, at least some obsidian was *not* subject to commercialized exchange. Exotic green obsidian from Central Mexico entered the Copán royal acropolis (and the kingdom as well) in the form of finished composite artifacts. Moreover, during the Classic period, green obsidian was used only in apical elite contexts. That is, obsidian tools and ornaments from the distant Pachuca source were received by royalty and were not even redistributed to lesser members of the nobility.

Aoyama's (1999) more extensive regional analysis supports this observation but, more important, notes a very sharp economic boundary in the northern extremity of the La Entrada region between sites with access to Ixtepeque obsidian (the principal source used at Copán) and sites that received most material from Honduran sources. In other words, the Copán regional economy—like that of Tikal—was tightly bounded to the north. Moreover, Aoyama argues that within the Copán system, access to obsidian and especially to prismatic blade technology was managed by the elite. My investigations at the site core support this notion. In contrast, Aoyama observes that rural households had less access to obsidian than did urban elite households and that rural dwellers also tended to use ad hoc flake tools rather than blades. Aoyama does not employ Carol Smith's economic typology, but his detailed analysis depicts the Classic-period Copán economy as sharing some qualities with both bounded networks and solar central-place systems. We might expect, then, that Classic Maya polities either administered or redistributed obsidian or perhaps both. It is clear that in Classic-period Copán, elites rather than the forces of supply and demand monitored the value of and (to a certain extent) access to both obsidian and blade technology.

### THE TERMINAL CLASSIC AND POSTCLASSIC NORTHERN MAYA LOWLANDS

Several publications have presented obsidian data from a host of sites in the northern Maya lowlands that date to the Terminal Classic and other periods (Figure 6.1; Braswell 1997, 2003; Braswell and Glascock 2002, 2007; Nelson 1985). Using Hirth's (1998) two criteria of procurement homogenization and need-based access, Michael Glascock and I have argued that within the Itzá polity, obsidian was subject to two sorts of market exchange during distinct periods (Braswell and Glascock 2002). In the ninth century, the economic system of the Itzá polity was tightly bounded. Fully 71 percent of the obsidian found at Chichén Itzá and 80 percent of that collected at its port of Isla Cerritos came from Central Mexican sources. In contrast, neighboring

centers such as Ek Balam and Cobá received more than 90 percent of their obsidian from Guatemalan sources, especially El Chayal. Nowhere is this boundary so striking as at Yaxuná, only 19 km southeast of Chichén Itzá. There, 84 percent of the recovered obsidian came from El Chayal, and all the Mexican-source artifacts were found in contexts associated with the destruction of Yaxuná by Chichén Itzá. The sharply bounded nature of the ninth-century Itzá obsidian distribution system and evidence for some sort of market exchange together imply the existence of a solar central-place system and an administered market economy at Chichén Itzá during the ninth century (Braswell and Glascock 2002).

Exciting data from the Puuc region strongly suggest that sometime around AD 900, Uxmal and related sites began to participate with Chichén Itzá in an open, interlocking central-place system. Extensive excavations directed by José Huchím and Alfredo Barrera (Huchím Herrera and García Ayala 2000; Kowalski et al. 1996) within the center of Uxmal and at some distance from the city revealed that contexts dating to the ninth century have very little exotic Mexican obsidian. In contrast, during the tenth and early eleventh centuries there was a three-fold increase in the relative abundance of obsidian from central Mexican sources. Moreover, the same homogenized market “mix” of Central Mexican obsidian seen at Chichén Itzá is also represented at Uxmal, Xkipché, Labná, and at many other tenth-century Maya sites where Mexican obsidian is found. In descending order of quantity, this homogenized mix of Mexican obsidian comes from Ucareo (42 percent), Pachuca (31 percent), Zaragoza (10 percent), Paredón (9 percent), Pico de Orizaba (6 percent), Zacualtipán (1 percent), and Otumba (1 percent). Thus, distribution patterns suggest the breakdown of partially commercialized, regional, and bounded distribution systems and the emergence of a fully commercialized, interregional, and open market economy by about AD 900 (Braswell and Glascock 2002).

This interlocking central-place system, however, collapsed with the decline of Chichén Itzá and the Puuc region during the eleventh century. The rise of Mayapán at the beginning of the Middle Postclassic period saw the reorganization of obsidian procurement. Obsidian from the Ixtepeque, Guatemala, source replaced both El Chayal and the Mexican sources in importance. Bárbara Escamilla Ojeda (2004) analyzed more than 14,000 obsidian artifacts collected by Carlos Peraza Lope’s project in the central precinct of Mayapán. The Mayapán collection, in fact, contains more obsidian artifacts than have been recovered in recent decades from all other sites in the northern lowlands combined. Nevertheless, Tatiana Proskouriakoff (1962) and Clifford Brown (1999) have both noted that in the residential areas of Mayapán, obsidian is rather scarce. This marked difference between the great quantity of obsidian found in the elite epicenter and the scarcity of obsidian in more humble residential zones of the city suggests that during the Middle Postclassic period there were considerable class-based differences in access to this important resource. I interpret this as a return to a simpler distribution pattern based on either administered market behavior or—perhaps more likely—polyadic exchange.

## CONCLUSIONS

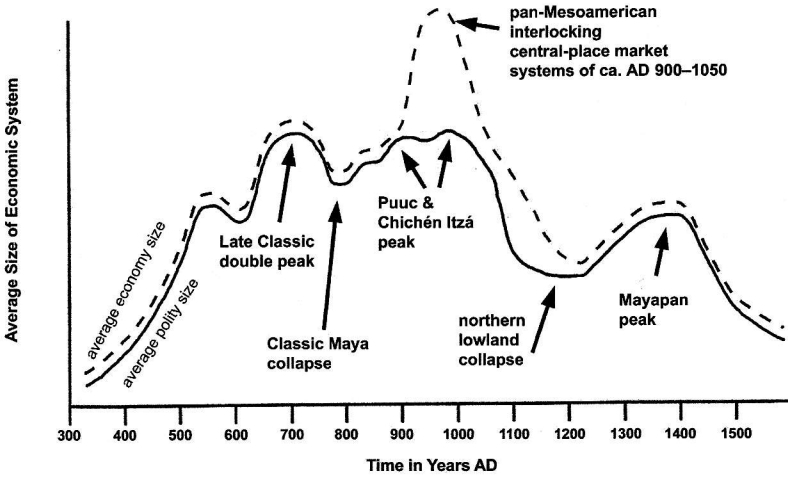
Marcus (1992, 1993) has proposed a dynamic and processual model of political complexity for the Maya region. The model is not strictly evolutionary because, unlike biological speciation, the change from one sort of political organization to another is reversible. A graph of her model contains many local peaks and valleys corresponding to oscillating cycles between complex chiefdoms and simple states and also between simple regional states and more large-scale and complex polities (Figure 6.4a). Throughout most of the Classic period (and probably from the Middle Preclassic onward), the size of economic systems, as measured by obsidian distribution patterns, was often closely related to the size of polities. This was true for periods when polities were organized as complex chiefdoms or as simple archaic states, that is, when Maya economies were structured either as bounded networks or administered markets. It was less true during the second half of the Terminal Classic period when a competitive market integrated the northern Maya lowlands with Central Mexico.

A graph of the complexity of exchange systems can also be drawn. If we superimpose this second typological curve on top of Marcus's polity size model (Figure 6.4b), two things are immediately apparent. First, the period of economic cycles is much greater than that of political cycles. There are far fewer valleys and peaks. Longer periodicity implies greater stability. Although both trade routes and the value of goods changed dramatically over time, the ways value was determined and exchange took place were far less subject to change than was the average size of polities.

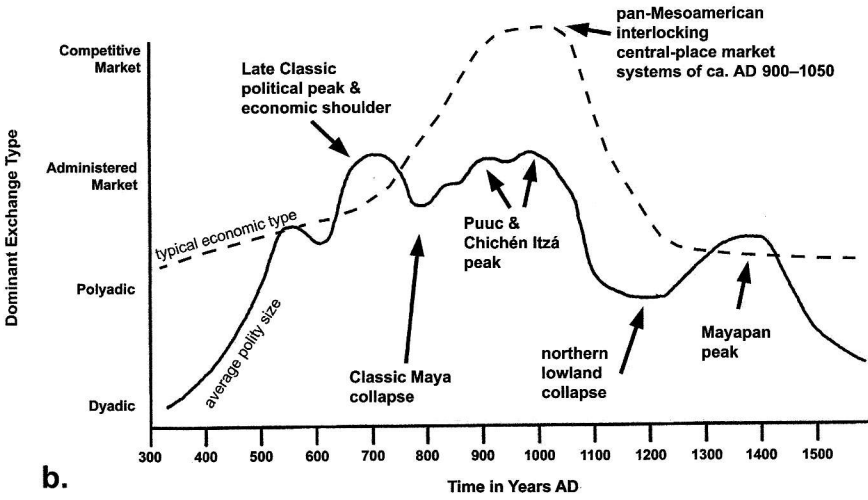
Second, the economic (type) and political (size) cycles do not closely correspond. This is what Christopher Garraty (Chapter 1) means in stating that political and market systems are at best "co-evolutionary." The lack of close correspondence between these two cycles implies that in the Maya region dramatic political change was not always causally linked with significant change in the nature of exchange. This distinction appears to be true even during periods when polyadic or administered market exchange was the norm, that is, when political concerns determined the value of obsidian. Even the Classic "collapse" did not cause Maya economies to revert to simpler forms than the administered market.

Nevertheless, the fragmentation of the Itzá and Puuc kingdoms in the eleventh century may have led to the end of Maya participation in a pan-Mesoamerican, highly commercialized economy. Evidence from Mayapán—specifically, the limited distribution of obsidian beyond the epicenter of the site—suggests that the breakdown of this regional collapse could have led to a system based on either administered market exchange or redistribution. What these two systems share is their bounded and centralized nature. Like the provinces of Marcus's political model, bounded and centralized economic systems (typified by either an administered market or polyadic exchange) constitute the largest stable economic unit. Such bounded and centralized systems are the breakdown products of more complex market systems.

Karl Polanyi (1957:248, 250) once wrote that for premodern societies, economy is "embedded" in other forms of social behavior, including political relationships.



a.



b.

6.4. Economy and average polity size in the Maya area: (a) comparison of the areal extent of economic and political systems, (b) comparison of economic type and polity size (polity size data from Marcus 1993:figure 26).

Nevertheless, the general lack of correspondence between Maya political and economic cycles, except during the late Terminal Classic when both complex states and a fully commercialized economy (*sensu* C. Smith) coexisted, seems to suggest the opposite. Contrary to Polanyi, the interdependence of economic and political systems becomes greater rather than less as complexity increases.

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## NOTES

1. In my view, price is a concept that exists only in economic systems that employ money or some other standardized and quantified measure of cost. Here, I use "value" to mean the cost of obsidian, probably exchanged in the more qualified form of goods, services, or less tangible obligations.