

# What Maya Collapse? Terminal Classic Variation in the Maya Lowlands

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**Abstract** Interest in the lowland Maya collapse is stronger than ever, and there are now hundreds of studies that focus on the era from approximately A.D. 750 to A.D. 1050. In the past, scholars have tended to generalize explanations of the collapse from individual sites and regions to the lowlands as a whole. More recent approaches stress the great diversity of changes that occurred across the lowlands during the Terminal Classic and Early Postclassic periods. Thus, there is now a consensus that Maya civilization as a whole did not collapse, although many zones did experience profound change.

**Keywords** Maya · Collapse · Terminal Classic–Early Postclassic

## Introduction

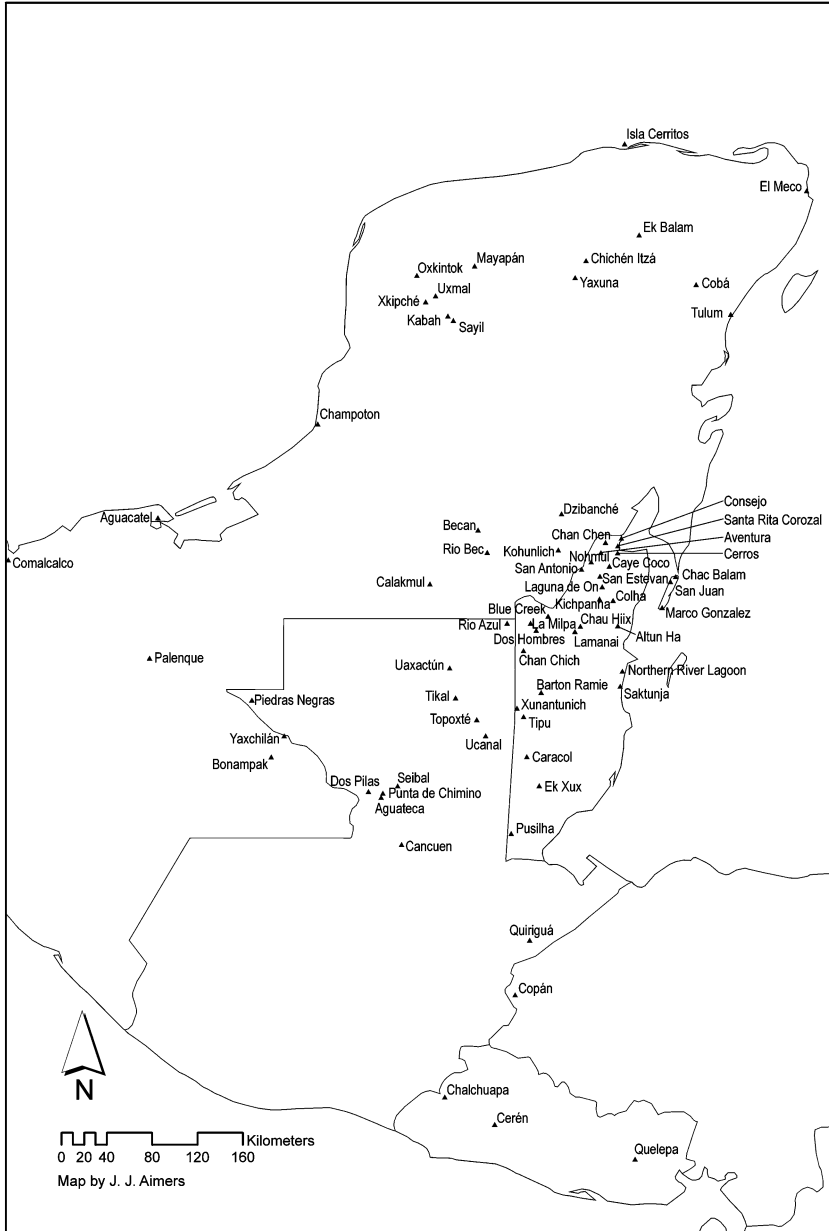
“Much has been published in recent years about the collapse of Maya civilization and its causes. It might be wise to preface this chapter with a simple statement that in my belief no such thing happened” (Andrews IV 1973, p. 243).

More than three decades after Andrews made this statement, interest in the lowland Maya collapse is more intense than ever. Of the more than 400 books, chapters, or articles of which I am aware, over half were published in the last ten years. As always, speculation about the collapse follows contemporary trends (Wilk 1985), and widespread concern over war and the physical environment have made the lowland Maya into a cautionary tale for many (Diamond 2005; Gibson 2006;

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Peterson and Haugh 2005; Sewell 2003; Tueth 2000). Although the media and the general public tend to focus on single-factor explanations for a supposedly pan-Maya collapse, archaeologists have reached a consensus that the timing of the collapse of lowland sites (Fig. 1) varied regionally and sometimes by site, as did the



**Fig. 1** Map of the Maya area showing sites mentioned in the text

proximate causes. Furthermore, some sites did not collapse, many traditions continued, and new sites and traditions emerged in the Postclassic period. In the broadest sense, then, Andrews was correct: there was no Maya collapse.

I use the term collapse as shorthand here to refer to the interval between the height of the Classic period and the subsequent Postclassic period, the dates and characteristics of which varied across the lowlands between approximately A.D. 750 and A.D. 1050. Due to the cultural variation evident in this period, terms now used for it include “decline” (Dunham 1990; Hammond et al. 1998; Ringle et al. 2004; Shaw 1995; Webb 1973), “transition” (Aimers 2004b; Bey et al. 1997; Hester 1985; D. Rice 1988; Ringle et al. 2004; Schmidt 1998), “transformation” (Adams 1973b; Masson 1997; P. Rice and D. Rice 2004; Rosenswig and Masson 2002; Schwarz 2004; Tourtellot and Gonzalez 2004), and “crumble” (Farriss 1984). In this article I discuss collapse or continuity at sites across the Maya lowlands and review research with a focus on which causes are favored, if any, for their survival or demise. Finally, I note some prospects in the study of this extraordinary era.

### The Terminal Classic–Early Postclassic

In the southern lowlands the Terminal Classic has traditionally referred to the period of decline and abandonment of many sites at the end of the Classic (Adams and Trik 1961). Monumental construction and the erection of stelae ended at many sites, although in some cases Terminal Classic people occupied architecture built in earlier eras (Adams 1973a; Andrews V and Sabloff 1986; Culbert 1973b; Freidel 1986b; Hammond 1974; Walker 1990; Webb 1973). One of the most notable changes is the breakdown of divine kingship. Events in the northern lowlands are different, with florescence while sites are collapsing in the south and a generally later decline overall, although variation is present there too (A. Chase and D. Chase 1992).

Until the last 20 years or so the Early Postclassic period in most parts of the lowlands was generally thought to have been a period of great cultural decline. The elite architecture and artifacts so well known from Late Classic times are much rarer, and status differences appear to have been less pronounced than in the Classic period. Following Tainter (1988), this can be considered a cultural adaptation to circumstances that made the costs of maintaining an elite difficult, disadvantageous, or impossible. Thus, Masson (2000, p. 274) has called the Postclassic “an aftermath of tyranny.” Despite the collapse of many sites, the Postclassic (Early and Late) was an era of innovation and vigor at many others (see various chapters in Smith and Berdan 2003).

Many recent accounts of the collapse stress the continuity of artifacts and practices from the Classic into the Postclassic (e.g., D. Chase and A. Chase 2004, 2006) and the fact that the Terminal Classic varied at different sites from approximately A.D. 750 to A.D. 1050. In that sense, the Terminal Classic is a stage rather than a phase (Forsyth 2005). This temporal and spatial variability has led to different terminology depending on whether the Terminal Classic is treated as a separate period or as part of a long transition to the Early Postclassic. In areas where

the collapse of sites was most dramatic (e.g., in the western Petén or Copán), it is easier to see the differences between these periods and they are treated separately (e.g., Mock 1998). In other areas, such as northern Belize, gradualism in artifact change and continuity in site occupation make the two periods difficult to identify separately, and the periods are frequently combined under terms like “the Terminal Classic to Early Postclassic transition” (Aimers 2004b; Ball 1983; D. Chase and A. Chase 1988; Graham 1987; Pendergast 1985b; Walker 1990). In this discussion I treat the Terminal Classic and Postclassic separately when they have been treated that way, and together when they have been combined. P. Rice and Forsyth (2004, fig. 3.3) summarize this temporal variability for sites across the lowlands in tabular form.

What happened during the transition from Classic to Postclassic and what can we do to explain these events? This review cannot include all the details of the Terminal Classic–Early Postclassic transition across the Maya lowlands, and many good reviews already exist (e.g., Adams 1973a; Andrews V and Sabloff 1986; A. Chase and P. Rice 1985; Cowgill 1964; Culbert 1973a, 1988; Demarest et al. 2004b; Freidel 1983, 1986b; Marcus 2001; Rands 1973a; Sabloff 1973b, 1992; Sanders 2003; Santley et al. 1986; Sharer 1977; Shimkin 1973; Webster 2002, 2003; Willey 1971; Willey and Shimkin 1971, 1973). Following Sabloff (1973b), however, hypotheses related to the Maya collapse are listed in Table 1, with some modifications and additions.

Archaeologists now agree that there is regional and even site-by-site variability in the collapse, and most recent studies offer multivariate explanations (e.g., A. Chase and D. Chase 2004, 2005; Fash and Sharer 1991). For example, environmental explanations of the collapse often overlap (e.g., drought, subsistence stress, deforestation, and soil erosion). Few scholars see the collapse as a result of purely environmental factors and most note the inadequate response of Maya leaders, and this has led to some studies that characterize the collapse as a form of ideological failure or a period of major ideological change (Ringle et al. 1998). Thus, the categorization in Table 1 inevitably simplifies complex arguments and should be treated merely as a guide to discussions that include the themes listed.

Across the lowlands the Terminal Classic was a time in which elements of Classic Maya culture and society were renegotiated, sometimes violently. Some aspects of Classic Maya civilization appear to have continued unchanged, while others were abandoned or dramatically altered. This is characteristic of collapses in many parts of the world (Schwartz and Nichols 2006). Some notable differences that we see between the Classic and the Postclassic are common after episodes of collapse cross-culturally: (1) A decline in elite paraphernalia (e.g., carved stelae, monumental architecture) suggests decreased social stratification and decentralization of power compared to the Classic period. The abandonment of the Long Count also can be considered evidence of a change to (or a return to) an emphasis on “corporate” over “network” modes of political organization (see Aimers and Rice 2006, p. 92; Feinman 2000; Miller 1986, for discussions of the sociopolitical implications of cyclical versus linear calendrics among the ancient Maya). (2) Trade played a central role for sites and regions that survived into the Postclassic. Schwartz (2006, pp. 7–8, 11) discusses the importance of trade in both collapse and

**Table 1** Proximate causes of Maya site abandonment

Internal Explanations	
References	
<b>Environmental</b>	
Soil erosion/loss of fertility/change to untillable savanna	(Atran 1993; Beach et al. 2006; Cooke 1931; Emery et al. 2000; Harrison 1977; Jacob 1992, 1996; Morley and Brainerd 1956; Paine and Freter 1996; Pohl 1990; D. Rice 1978, 1996; Wingard 1992; Wiseman 1985; Wright and White 1996)
Climate change/drought	(Broecker 1995; Chepstowlusty 1996; Dahlin 1983, 1987, 2000, 2002; Dunning 1992; Folan 1981; Folan et al. 1983; Gill 1994, 2000; Gunn and Adams 1981; Gunn et al. 1995, 2002; Haug et al. 2003; Hodell et al. 1995, 2001, 2005; Hunt and Elliot 2005; Kerr 2001; Leyden 2002; Leyden et al. 1998; Lucero 2002; Messenger 1990; Pierrebourg 1996; Robichaux 2002; Shimkin 1973; Wahl 2005; J. Webster 2000; Yaeger and Hoddell 2002)
Overpopulation/ subsistence stress	(Culbert 1974, 1977, 1988; Dunning and Beach 1994; Haviland 1967; Johnston 1994)
Earthquakes	(Bevan and Sharer 1983; Mackie 1961)
Hurricanes	(Sabloff 1973b)
Ground slope change	(Moseley 1983)
Volcanic activity	(Espindola et al. 2000; Gill and Keating 2002)
Deforestation	(Abrams and Rue 1988; Brenner 1983a, 1983b; Brenner et al. 2002; Curtis et al. 1998; Deevey 1978; Deevey et al. 1979; Dunning et al. 1997, 1998; Islebe et al. 1996; D. Rice and P. Rice 1984; Schreiner 2002; Shaw 2003; Wiseman 1985)
Disease/plague	(Acuna-Soto et al. 2005; Pozo Ledezma 1985; Saul 1973; Spinden 1928; Wilkinson 1995)
Insect infestation/plant blight	(Brewbaker 1979; Turner 1974)
<b>Sociopolitical</b>	
Peasant revolt or class conflict	(Altschuler 1958; A. Chase and D. Chase 2004, 2005; Erasmus 1965; Hamblin and Pitcher 1980; Kaplan 1963; Kidder 1950; Lowe 1982; Mason 1943; Morley and Brainerd 1956; Palka 1995, 1997; Satterthwaite 1936, 1937; Thompson 1931, 1954, 1970)
Intersite warfare	(Demarest 1978, 1993, 1996, 1997, 2004, 2006; Demarest and Valdés 1995; Demarest et al. 1997; Emery 1997; Foias 1996, 2004; Foias and Bishop 1997; Freidel and Rutledge 2001; Inomata 1995, 1997, 2003, 2006; Palka 2001; Van Tuerenhout 1996; Webster 1977, 1978, 1993, 2000a)
External Explanations	
Change in trade routes	(Rathje 1973)
Competition from Central Mexico	(Freidel 1986a, b; Webb 1973, 1978)
Invasion with resettlement	(Cowgill 1964)
Invasion without resettlement	(Adams 1973; Ball 1977; D. Chase and A. Chase 1982; Graham 1973; Hester 1985; Sabloff 1973a; Smith 1981)
Political-ideological pathology, fatalism	(Dornan 2004; Dunham 1990; Houston et al. 2001; O'Mansky and Dunning 2004; Puleston 1979; Pyburn 1996)

regeneration elsewhere. (3) Increased symbolic references to other regions (especially central Mexico) suggest increased interregional interaction. These likely signal more extensive or intense sociopolitical and/or religious networks (e.g., Rice 1983; Ringle et al. 1998). (4) Important sites are generally smaller and appear to have integrated or controlled smaller territories than in the Classic period (Tainter 1988), although alliances may have been extensive. (5) Population movement probably increased (especially south to north), but there is little agreement about its nature or scale (Aimers 2004a).

The following is a brief overview of the Terminal Classic–Postclassic across the Maya lowlands with reference to these changes and others. Many of these sections build upon and update my earlier work (Aimers 2003a, b, 2004a, b).

### Northwestern zone

The northwestern edge of the Maya area includes the Gulf Coast of Tabasco and Campeche and the Usumacinta drainage inland to the Pasión region. Comalcalco, Aguacatal, Palenque, Piedras Negras, Yaxchilán, and Bonampak are some of the best-known sites there. Early research on the Gulf Coast in particular identified “Mexican” elements in ceramics and other artifacts (e.g., Andrews IV 1943; Berlin 1956; Drucker 1943a, b; Hellmuth 1967; Proskouriakoff 1951). Teotihuacán’s demise in the Classic period may have provoked competition for resources and trade routes among groups who had cooperated with Teotihuacán in the past (e.g., Sabloff and Rathje 1975). One of these groups, the Chontal or “Putun” Maya (Thompson 1970) of southern Campeche and Tabasco (Scholes and Roys 1948), is often invoked as the people who brought these “foreign” elements into Maya society (Fox 1989).

The nature of Chontal Maya influence on the Yucatán peninsula and the southern lowlands is still unclear (Ball and Taschek 1989; Kowalski 1989). Current discussions tend to downplay large, rapid migrations of these people while stressing more complex, long-term interaction among central Mexico, the Gulf Coast, and the Maya area (for a historical overview, see Jones 1995, pp. 69–79). They may have been aggressive or even militaristic merchants like the Aztec *pochteca* (Ball 1979, p. 30; Bittman and Sullivan 1978) or farmers and traders seeking fertile land or trade materials (Fox 1980). In a recent discussion, Sabloff (2005, p. 185) reiterated his belief in their “important role” in lowland Maya life from the Terminal Classic until Spanish conquest, and they appear to have played a central role in the Petén Postclassic (D. Rice 1986, p. 336). Thus, more work in this zone will help us better understand the Maya Terminal Classic and Postclassic elsewhere.

In the Late Classic there was an increase in the size and number of sites closer to the coast in the Chontalpa area around Comalcalco, and in the Postclassic period there were even more, albeit smaller, sites (Rands 1973b, p. 202). Aguacatal was strategically located for trade at the mouth of the Candelaria River. Petén influences declined at Aguacatal as many of the Petén sites were abandoned, and in the subsequent Postclassic there was a “cultural unity” in the area with Aguacatal as part of an invigorated coastal interaction system (Matheny 1970, p. 121). Ceramics

in this region show gradual transformation and hybridization of local with “foreign” elements rather than abrupt change.

The abundance of fine-paste wares in the Veracruz–Tabasco region as early as the Preclassic period (Rands 1973b, p. 199) has led to the northwest zone being called the “fine-paste zone” (Adams 1973b; Miller 1977). Fine-paste pottery seems to replace the popular Late Classic polychromes of Campeche and Petén in the Terminal Classic–Early Postclassic across the lowlands (Forsyth 2005) and represents “a critical shift in spheres of interaction away from Central Petén and toward the western lowlands and periphery” (Foiás and Bishop 2005, p. 37). In the Petén itself, even as sites declined, ceramic influences came from the northwest instead of the thriving northern Yucatán zone in the Terminal Classic because the Petén sites always had stronger ties to the northwestern and Usumacinta zones (Forsyth 2005). The decline of sites like Piedras Negras and Yaxchilán in the ninth century may be linked in part to disruptions in trade and tribute networks due to warfare and collapse elsewhere (Foiás 1996, 2004; Foiás and Bishop 1997; Webster and Houston 2003). The robust coastal occupation of the northwestern zone and ethnohistoric evidence that its residents were later important traders across the Maya area suggest that river and coastal trade was important to people and sites that survived the changes of the Late Classic (Graham 1989; Mock 2005b).

### The Petén zone

The Petén zone has held a central place in studies of the collapse because so much early archaeology was conducted there, and this sampling bias has influenced all subsequent treatments of collapse. Early on, Cowgill (1964) introduced the idea of Mexican invasion with forced resettlement around Chichén Itzá to explain the drastic drop in population that accompanied the collapse in the Petén. He also noted that although ecological explanations for collapse and depopulation were popular, evidence at that time was lacking (e.g., Coe 1957; Meggers 1954). These issues remain important, and depopulation must be considered when assessing the collapse in the Petén. For example, socially based scenarios for site abandonment, such as peasant revolt, do not explain the reduction of both commoner and elite populations (Cowgill 1964, p. 193; Willey 1956).

*The Classic Maya Collapse* (Culbert 1973a) continued the Petén focus with an emphasis on invasion. Culbert (1973b, p. 80) concluded that (Postclassic) Caban evidence at Tikal suggests that the site was taken over by newcomers with ties to Yucatán. Reasons for the decline in this region are still unclear, but they seem to be related to internal political problems rather than to external factors such as invasion. Valdés and Fahsen (2004) have suggested that by A.D. 830–850 population had begun to decline at centers in the region and secondary centers started to gain power in the late ninth century as Tikal declined (see also Culbert et al. 1990). If the Petexbatun region is any indication, war was a central factor, and the last monument at Uaxactún, Stela 13 (A.D. 830), refers to a military event. The last monument at Tikal was erected in A.D. 869, although the Terminal Classic there may extend as late as A.D. 1000. The Postclassic period at Tikal shows only very ephemeral

evidence of occupation (Adams and Trik 1961; Puleston 1973; Turner 1990, p. 321), and Uaxactún has no evidence of Postclassic occupation at all.

As noted above, in the Terminal Classic period there was a reduction in polychrome vessels and fine-paste ceramics or their imitations were introduced from the western margins of the lowlands. Changes in Petén ceramics during the Terminal Classic suggest changes in production and consumption of fine pottery but not in utilitarian forms such as water jars. As Forsyth (2005, p. 10) notes, this suggests that the production and distribution of the two categories was controlled by different social groups. These findings reinforce the idea that the “collapse” was primarily an elite phenomenon and that the Late Classic and the Terminal Classic were together an era of elite interdependency and peer-polity interaction around the lowlands (see also Culbert 1991, pp. 325–326; Freidel 1986a; Jones 1991, p. 120; Sabloff 1986). Although the Terminal Classic is often considered a period of ceramic regionalism, particularly in domestic wares, the similarities in finewares across the lowlands probably relate to elite interaction (A. Chase and D. Chase 2004, 2005).

Archaeologists disagree on the significance of the larger cooking and serving vessels found in the Terminal Classic. Fialko (2005) links them to storage needs resulting from sedimentation in the Homul River, either from scarce rains or human neglect of fields (see also Vallo 2005). Others argue that large vessels are may be prestige items (LeCount 2005; Nelson 1981, p. 113).

Laporte (2004) documented both florescence and decline in the Mopán Valley from the eighth to tenth centuries. Of the 26 polities he identified from the period, those with robust occupation (e.g., Ucanal) adopted stylistic influences from the northern lowlands in architecture (e.g., round structures) and ceramics and may have been places of refuge for people from less stable areas to the west. Laporte and Mejía (2001) suggested that in the ninth century the Mopán arrived in the southeast Petén from Yucatán (probably the Puuc area). These appear to have been small, possibly elite migrations in the Late Classic, Terminal Classic, and Postclassic, and they may have been related to the control of trade. The last wave was in the 11th century. Generally, then, these northern influences were introduced and absorbed gradually through trade and immigration. In the Late Postclassic the Mopán sites declined, perhaps due to the centralization of (hostile?) Itzá power around the Petén lakes. Laporte’s (2004, p. 230) dating of the Terminal Classic as late as the 12th century supports the idea that the Terminal Classic was a stage that different sites or zones passed through at different times and at different rates (see also Forsyth 2005).

## The Petén lakes

Cowgill’s (1963) early work around Lake Petén–Itzá and Lake Sacpuy was followed by Bullard’s investigations at Topoxté and Macanche (1973). The University of Pennsylvania conducted research in the Lake Petén area (e.g., A. Chase 1985a, 1990), and the Central Petén Historical Ecology Project has examined sites around lakes Yaxha, Sacnab, Macanche, Salpetén, Quexil, and Peténxil (e.g., D. Rice 1986,



1988; D. Rice and P. Rice 1980; P. Rice 1979, 1980, 1986, 1987b; P. Rice and D. Rice 1985; Schwarz 2004).

After examining farming practices around Lake Petén in the late 1950s, Ursula Cowgill (1962) suggested that agricultural failure was not the main factor in the Classic Maya collapse, and she was an early advocate of multivariate models of collapse. Cowgill's conclusions are reasonable since the Petén lakes is one of the few zones of the southern lowlands that was continuously occupied into the Postclassic (A. Chase 1979; P. Rice 1979). Ethnohistorical accounts suggest that the Petén Itzá were Chontal speakers who moved to Yucatán, founded Chichén Itzá, and traveled south to the Petén lakes region after the site's decline. In an alternative interpretation, Late Classic refugee elites from the southern lowlands retreated to allied states in the north (Schele et al. 1995, p. 16) and allied with the indigenous Maya of Yucatán and refugees from Teotihuacán. Thus, in the mid-15th century the Itzá of Chichén Itzá fled to the Petén rather than the Gulf Coast because they had ancestral ties to the Petén (see also Rockmore 1998; Shuman 1978). For more on the Itzá, see Barrera Vásquez and Morley (1949, pp. 29–31), Ball (1986), and Ball and Taschek (1989).

Using the concept of technological style in ceramics, Cecil (2001) identified two historically known social groups (the Kowoj and the Itzá) in the Petén lakes region from A.D. 900 to A.D. 1200. Relations between these groups were not necessarily peaceful, but similarities in pottery across the area suggest trade and communication (Cecil 2001, p. 545; see also Cecil 2004; Cecil and Neff 2006). Based on ceramic distributions, P. Rice (1987b, p. 61) called the interaction spheres of the Terminal Classic “microscale,” and the Postclassic ceramics are even more variable (A. Chase 1982), but a collapse of the magnitude experienced in adjacent areas does not seem to have occurred in the Petén lakes. This may be due in part to immigration from the troubled Petexbatun and Pasión polities in the Terminal Classic (Demarest et al. 2004a, p. 554; D. Rice 1986). There are exceptions though: Topoxté appears to have been abandoned in the Terminal Classic and reoccupied in the Late Postclassic (Wurster et al. 2000).

Ceramics of the Petén lakes, the central Petén, and the Belize Valley became more similar in the Terminal Classic (P. Rice 1987b, p. 56), when stylistic influences from the Gulf Coast and the Yucatán peninsula were incorporated. The decline of the Petén sites and the rise of power in the northern lowlands is part of the reason for this change, but why did sites in this particular location survive when sites in nearby areas collapsed? Aside from the possibility that access to water was important, the ties between Itzá residents of the northern and southern lowlands is probably relevant. Early Postclassic ceramics are considerably different from their predecessors in both utilitarian and finewares, suggesting that population movements from the north had occurred.

## The Yucatán peninsula

Many sites in the northern lowlands were thriving while southern lowland sites were in decline due in part to migrations from the southern lowlands and the Gulf Coast

(Ball 1994; Carmean et al. 2004; Freidel 1981; Smyth et al. 1998, p. 254; Suhler et al. 2004). The Puuc centers such as Uxmal and Sayil may have adopted a system of “*mul tepal*” (joint rule) like that documented ethnohistorically at Mayapán (Ball 1977b; Freidel 1986b, p. 106; Ringle 1990, pp. 233–234; Roys 1962; Schele and Mathews 1998, p. 240; Wren and Schmidt 1991). Ninth and tenth century fortified sites indicate competition and warfare (Dahlin 2000; Webster 1978). Regional political disputes, competition with Chichén Itzá, the possible impact of drought, and population increases due in part to migration are likely factors in the 11th century decline of the Puuc sites (Andrews and Robles C. 1985, p. 66; Braswell et al. 2004; Dunning 1992; Hodell et al. 1995; Michelet et al. 2000; Tourtellot 1990). Overall, however, “the reasons for the depopulation of the Puuc area and its timing are unclear. Although some sites were abandoned rapidly, others survived into the Postclassic period, especially on the western and northern edges of the Puuc zone” (Carmean et al. 2004, p. 446). There is disagreement about the timing of abandonment of sites like Xkipché (see various articles in Prem and Grube 2003). Oxkintok was abandoned by about A.D. 1050 (López de la Rosa and Velázquez Morlet 1992), while Kabah was occupied into the 13th century (Carrasco Vargas and Pérez 1993).

Carmean et al. (2004, p. 441) note that evidence for the impact of drought in the Terminal Classic Puuc area is conflicting. Curtis et al. (1996), Hodell et al. (1995), and Leyden et al. (1998) present evidence for a dry period ca. A.D. 700–900, but Leyden et al. (1996) could find no evidence of this drought in the dry northwestern Yucatán, and population was peaking in the Puuc region at the time of the supposed drought. Carmean et al. (2004) suggest that drought may have contributed to other human-made problems such as deforestation (see also Abrams and Rue 1988; Shaw 2003) or warfare and that this triggered collapse.

Occupation in the Río Bec area shifted among sites in the Late and Terminal Classic periods (Arnould and Lacadena 2004; Michelet et al. 2004; Nondédéo and Lacadena 2004), and Calakmul and the region as a whole lost as much as 90% of their population by A.D. 850 (Braswell et al. 2004; Demarest et al. 2004a, pp. 554–555; Turner 1990). Becan may have mediated trade between Calakmul and sites to the north and west (Braswell et al. 2004, p. 181), and Becan’s ceramic traditions were reoriented from south to north in the Terminal Classic (Ball 1977a, 1986). Braswell et al. (2004) argue that although population declined precipitously between the ninth and tenth century at Calakmul, political and economic adjustments allowed the site to survive for some time in the tenth century. They suggest that while prolonged drought in the area may have been the final factor leading to the collapse of Calakmul, political problems began as early as the seventh century (see also Gunn et al. 2002b). To the east, in southern Quintana Roo, there was variability: Dzibanché was in decline during the Late Classic (Nalda 2005), while construction continued later at Kohunlich only 30 km away, and the site was occupied into the Postclassic (Nalda 2002).

In the northeast of the peninsula, Ek Balam was occupied from the Middle Formative to the 16th century (Ringle et al. 2004, p. 490), with the site’s peak in the late Terminal Classic somewhere between A.D. 700 and A.D. 1050. Serious social disruptions are suggested by the abandonment of unfinished buildings (Ringle et al.

2004, p. 503) but there is no good evidence of intense warfare or drought as major factors in the site's decline. Based on ceramic finds, Postclassic occupation is estimated at less than 10% of the Terminal Classic occupation. The center was abandoned although some effigy censers were deposited in the main plaza. Ringle et al. conclude that: "Political fragmentation was followed at some later date by apparent demographic collapse, but the linkage between the two remains obscure" (Ringle et al. 2004, p. 514).

At Chichén Itzá the traditional linear succession ceramic sequence included a Late Classic-Terminal Classic Puuc–Maya phase represented by Cehpech sphere ceramics (A.D. 800–1000), followed by an Early Postclassic Toltec or Putun "Mexican" phase represented by the Sotuta sphere (A.D. 1000–1200) (Smith 1971). Archaeologists now see partial or total overlap between Cehpech and Sotuta in the Terminal Classic (Cobos 2004; Lincoln 1986). Thus, the main occupation of Chichén Itzá was largely in the Terminal Classic, with the abandonment of the site core at approximately A.D. 1100 (Andersen 1998, p. 15; Andrews V 1979; Ball 1979; Cobos 2004).

This new chronology has implications for issues of interregional contact and the collapse across the lowlands (D. Chase 1986), but not everyone agrees with it. Based on the presence of Hocaba pottery in terminal levels at Chichén Itzá and in line with historical sources, Suhler et al. (2004) believe that Chichén Itzá's demise was triggered as late as A.D. 1250 by people from Mayapán or elsewhere on the east coast (see also Suhler et al. 1998, p. 179). Thus, they posit a longer period of Chichén Itzá dominance on the peninsula, with influence along the coast at least as far as the Belizean Cays (Cobos 1989; Guderjan et al. 1989a, b; Robles Castellanos and Andrews 1986, pp. 83–85) and Lamanai (Pendergast 1990) until A.D. 1250 (see also Andrews V and Sabloff 1986, p. 452). For Suhler et al. the late facet of the Terminal Classic (Yaxuna IVb) extends from A.D. 900 to A.D. 1250, making it coeval with what is often called the Early Postclassic elsewhere.

Whichever chronology one accepts, interpretations of Chichén Itzá refer to increasingly benign forms of central Mexican influence in the Maya lowlands (for a review, see Jones 1997; Wren and Schmidt 1991). Hypotheses have shifted from "Toltec invasion" (Hellmuth 1967; Morley and Brainerd 1956; Proskouriakoff 1950, 1951, p. 109) and its Putun variant (Thompson 1970) to conceptions of the city as multiethnic (Andrews 1990a; Kepecs et al. 1994). Proskouriakoff's (1970) idea that depictions of Maya and Mexican elites at Chichén Itzá were an expression of alliance rather than conquest has been revived (A. Chase 1985b, p. 105), and Chichén Itzá is seen as an ethnically Maya city participating in an intensified Mesoamerican interaction sphere or world system (Cohodas 1978; Kepecs et al. 1994; Lincoln 1991; Ringle and Andrews V 1990). Chichén Itzá came to dominate the peninsula through trade (in part through its port at Isla Cerritos), the internal power-sharing of *mul tepal* political organization (Freidel 1992), and probably military force. Events surrounding the demise of Cobá are still unclear, but its ally Yaxuná fell to Chichén Itzá about A.D. 900 and Uxmal fell to Chichén Itzá at the beginning of the 10th century (Shaw 1998; Suhler et al. 2004, p. 457).

Ringle et al. (1998) have suggested that "Itzá" is essentially a religious identity. Their article argues for the existence of a long-lived, pan-Mesoamerican axis of

politico-religious interaction focused on the cult of Quetzalcoatl. This axis begins to account for the appearance of “Mexican” and “Gulf Coast” traits in the western Petén and in Yucatán. The spread of the cult, often by force of arms, provides a specific social mechanism accounting for the distribution of shared traits. The cult network also provides a logic for the significance and distribution of the Mixteca–Puebla style during the Postclassic period, although by then this axis was already old and in some disarray (Ringle et al. 1998, p. 225).

In this model much of the “Mexican” iconography at Chichén Itzá originated at Teotihuacán and spread through long-term Mesoamerican interaction after Teotihuacán’s decline. Many of these elements are part of the “the Postclassic religious style” (Smith and Heath-Smith 1980), the Early Postclassic facet of the Mixteca–Puebla style that Robertson (1970) called the “international style” of the Postclassic (McVicker 1985; Nicholson 1981). Smith and Heath-Smith (1980) similarly suggested that the Postclassic religious style was spread through a network of Mesoamerican religious interaction that included the Pacific coast of Mexico and Costa Rica (Willey 1973b). Religious practices and iconography would have helped unify people across the Yucatán peninsula (Bullard Jr. 1974; Freidel 1981, p. 330; Wren and Schmidt 1991, pp. 223–224) and also may have stimulated other forms of interaction such as trade (see, e.g., Freidel 1986a, p. 107). Once again, the importance of trade to cultural survival and regeneration is highlighted.

### **The Pasión–Usumacinta zone**

Sites in this zone reached their greatest population densities in the Terminal Classic, but then declined rapidly (Culbert 1988, p. 75). As in other areas, the Terminal Classic to Early Postclassic is now seen as a time of increased interregional exchange, perhaps accompanied by population movement, but not as an era in which the Putun or other groups invaded or colonized sites such as Seibal (Sabloff and Willey 1967). Stylistic changes at Seibal, formerly thought to be linked to Yucatán (Graham 1973; Sabloff 1973a) or the Gulf Coast (A. Chase 1985a; Miller 1977), have more recently been tied to the Petén (Kowalski 1989) and Ucanal (Schele and Mathews 1998; see also Stuart 1993). Recently, Tourtellot and Gonzalez (2004, p. 81) concluded that there is little evidence for a dramatic end at the site and Seibal appears to have simply “fizzled out...” For a related dismissal of the link between fine-paste wares and Terminal Classic foreign invasion in the Petexbatun and Pasión regions, see Foias and Bishop (2005) and López Varela (2005).

Based on skeletal samples from humans and animals, Wright (e.g., 1994, 1997a, b, c), Wright and White (1996), Emery (1997, 2004) and Emery et al. (2000) rule out environmental reasons for the collapse in the Pasión region. In humans they recorded relatively stable dependence on maize and meat consumption near the end of occupation and no increase in anemia, infectious disease, or dental growth disruption. Thus bioanthropologists favor sociopolitical causes (specifically, war) for the collapse in the zone as do their colleagues (see also Demarest 2003, 2004a; Tourtellot and Gonzalez 2004). Warfare and its disruptions may have weakened the

moral authority of rulers and caused a “crisis of faith” for ordinary people, who then left the region (Houston et al. 2001, pp. 238–239).

The Petexbatun region has provided dramatic evidence of endemic eighth and early ninth century warfare at sites like Cancuen, Aguateca, and Dos Pilas on a more intense scale than elsewhere in the lowlands (e.g., Demarest 1996b, 2004a, b; Demarest et al. 1997; Inomata 1997, 2003). Investigators there reject invasion or environmental deterioration as major factors in the collapse and argue for the primacy of internal warfare (Dunning and Beach 2004; Dunning et al. 1997, 1998; Foias and Bishop 1997, p. 285). Demarest (2004a, b) frames warfare as one of a suite of options for status rivalry in the Late Classic, one that spiraled out of control in the Petexbatun region (see also Miller 1993). Although warfare is the key factor, Demarest (1993, p. 111) has suggested that people fleeing warfare in the Petexbatun to fortresses such as Aguateca and Punta de Chimino “would have soon run out of arable land,” and in a later contribution (2004a) he speculates on the effects of refugees fleeing the early and intense collapse in Petexbatun on other areas of the lowlands. Postclassic period remains in the Pasión and Petexbatun are very rare (Johnston et al. 2001; Morgan and Demarest 1995) and may represent immigration from central Petén.

### The southeastern zone

The southeastern zone of the Maya area is often called a frontier (Henderson 1992, p. 157) because Maya people in this area were in contact with non-Mesoamerican societies. At Copán, environmental degradation has been put forth as the major factor in the site’s collapse (Abrams et al. 1996; Paine and Freter 1996), but violence also may have been associated with it (Andrews V and Fash 1992). Nutritional differences between commoners and elites may have caused internal tensions (Lentz 1991; Storey 1992, 1999; Whittington 1989, 1991), and militaristic imagery at the site increased near its demise, indicating the site’s aggressive stance (Fash 1992).

Fash et al. (2004) have described a rapid abandonment due to political crisis after the collapse of the ruling dynasty approximately A.D. 822, while Webster et al. (2004), using a chronology based mainly on obsidian hydration, have argued for a much more protracted collapse due to environmental deterioration that continued into 13th century (see also Braswell 1992; Freter 1992; Manahan 2003, 2004; Webster and Freter 1990a, b; Webster et al. 2000). The controversy is not resolved, but a 400–600-year Coner-phase ceramic tradition (Webster et al.’s view) is difficult for some ceramicists to accept, and the obsidian hydration dating technique has been questioned (Anovitz et al. 1999; Braswell 1992; but see Webster et al. 1993). In any case, the much smaller Postclassic Ejar-phase occupation that Manahan (2004) dates to A.D. 950–1100 is characterized by new ceramic and architectural traditions, perhaps from central Honduras, with no evidence of contextual mixing or stylistic ties with Coner-phase ceramics. At Copán, as in other areas, the reduced Early Postclassic occupation is associated with increased interregional interaction and possible population movement into the area (for more on the demise of Copán, see

Maca 2002; Manahan 1999, 2003; Paine 1992; Rue 1986, 1987; Sheehy 1991; Webster 1999, 2002; Webster and Freter 1990a, b; Webster et al. 1992, 2000, 2004; Wingard 1996).

Quiriguá appears to have been abandoned in the early ninth century and then reoccupied by different people shortly after. Sharer (1985) found eastern Yucatecan pottery, a *chacmool* sculpture, and ceramics similar to Early Postclassic Augustine Red from the Petén lakes and Belize. Although he initially suggested that the site was taken over by the Putun to control the Motagua River trade route and the local cacao economy (Sharer 1985, p. 408), in a later article Sharer (1991, p. 194) was less certain about whether these changes represented trade and information exchange, or invasion. Whatever the explanation, the site was again abandoned at the end of the Early Postclassic.

Comparable ceramic changes in the Ulúa Valley of Honduras are now seen as in situ developments rather than “foreign” introductions. Late Classic Ulúa polychromes were discontinued ca. A.D. 880–1010, and Fine Orange-like ceramics of the Baracoa ceramic group appeared. These ceramics are thought to have been produced by local people and not introduced into the area through disruptive intrusion (Lopiparo et al. 2005). This interpretation and Sharer’s above are examples of the general evolution of archaeological thought away from invasion to other forms of population movement and exchange in explaining stylistic change.

In El Salvador, Cerén is famous for being abandoned rapidly ca. A.D. 650 because of the eruption of the Loma Caldera volcano (McKee and Sheets 2003). Nicoya-style polychrome ceramics in El Salvador are often considered “evidence of ‘Mexicanization’ directly or indirectly associated with Mixteca–Puebla expansion” (Sheets 1981, p. 339), but these have been found in contexts sealed by volcanic ash at Cerén from the late sixth or the early seventh century A.D. (Sheets 1979). This pushes influences from the Gulf Coast and central Mexico back to the Classic period, resulting in a cultural patchwork by the Terminal Classic (Bruhns 1996, p. 292). Fertile soils at Quelepa may have attracted northerners (Andrews V 1977, p. 129), while the Chalchuapa region also provides evidence of population movements beginning in the Preclassic and possibly associated with Nahautl-speaking (Pipil) immigration in the Early Postclassic (Sharer 1974, p. 176). Foreign stylistic elements were adopted in this area and incorporated into locally produced pottery and other items. Sharer (1974, p. 174) has characterized the area as a type of multiethnic “multicommunity” (Reina 1965) often found in frontier or peripheral areas. Thus, people of the southeast were active participants in the interregional interaction of the Terminal Classic–Early Postclassic.

## Belize

The survival of many sites in northern Belize through the Terminal Classic and into the Postclassic is probably a result of their strategic location relative to northern Yucatán, the Caribbean coast, and the region’s rivers (Aimers 2004b; Masson 2000: 15, fig. 2.2; Sidrys 1983). Some sites in northern Belize (e.g., Caye Coco) may have prospered during the southern lowland collapse through new trade opportunities

with the Yucatán peninsula (Masson and Mock 2004), while others (e.g., La Milpa) declined quickly in the Terminal Classic (Hammond and Tourtellot 2004; Hammond et al. 1998). The large number of sites with known Postclassic occupation in northern Belize (Table 2) is striking given its peripheral status in the Classic period, but like the activity in the southeast and Gulf Coast frontiers, this has parallels in other parts of the world (Yoffee 2006).

Both continuity (e.g., Ball and Taschek 1989, p. 195; Graham 1987; Pendergast 1981b; P. Rice 1986, p. 282; Willey et al. 1965, p. 212) and disjunction (D. Chase and A. Chase 1988; Valdez and Mock 1985) are in evidence between the Terminal Classic and Early Postclassic in northern Belize, both of which have implications for the nature of interactions with people from farther north on the peninsula. The Terminal Classic and to a lesser extent the Postclassic at Lamanai were dynamic times, when architectural and ceramic traditions continued with northern influences that suggest peaceful interaction rather than invasion. In contrast to Lamanai, occupation at Colha ended violently in the Terminal Classic, probably at the hands

**Table 2** Northern Belizean sites with Classic and Postclassic materials

Region/Site	References
<b>New River</b>	
Cerros	(Lewenstein 1987; Robertson 1983; Walker 1990)
Aventura	(Sidrys 1983)
Lamanai	(Graham 1987, 2000/2001, 2004, 2006; Pendergast 1981a, b, 1982b, 1984, 1985a, b, 1986, 1992)
San Estevan	(Bullard Jr 1965; Levi 1996),
Chau Hiix	(Andres and Pyburn 2004)
NR5	(Masson 2000)
<b>Rio Hondo</b>	
Nohmul	(D. Chase 1982; D. Chase and A. Chase 1982; Hammond 1985; Pyburn 1989, 1990)
Consejo	(Masson 2000; Sidrys 1983)
Chan Chen	(Masson 2000; Sidrys 1983)
San Antonio	(Lewenstein and Dahlin 1990; Masson 2000; Sidrys 1983)
<b>Chetumal Bay</b>	
Santa Rita	(D. Chase 1984, 1985, 1986, 1990; D. Chase and A. Chase 1988; Quirarte 1982)
<b>Ambergris Caye</b>	
Marco Gonzalez	(Graham 1989; Graham and Pendergast 1989; Pendergast and Graham 1987)
San Juan	(Guderjan and Garber 1995)
Chac Balam	(Guderjan and Garber 1995)
<b>Inland Sites</b>	
Altun Ha	(Pendergast 1979, 1982a, 1992),
Colha	(Barrett and Scherer 2005; Hammond 1982; Hester 1982; Kotliar 1996; McAnany 1994; Michaels 1989, 1994; Michaels and Shafer 1994; Mock 1994a, b)
Laguna de On	(Masson 1993, 1995, 1997, 1999a, b, 2000)
Kichpanha	(Masson 2000; Shaw 1995).

of people from the Yucatán peninsula (Hester et al. 1981). There were Late Classic changes in settlement patterns, architecture, lithic technology (Masson 2001), subsistence, and ceramics. More ominously, a skull pit and other skeletal remains suggest elite executions (Steele et al. 1980). Subsequent Early Postclassic cultural patterns at Colha are “totally different from those of the Classic period” (Hester 1985, p. 6).

Similarly, at Nohmul elite people from Yucatán may have taken over the site (A. Chase 1986; D. Chase and A. Chase 1982; Hammond 1985). There was a Terminal Classic population increase (Pyburn 1989) and six new structures were added to the site core, including a round structure reminiscent of Chichén Itzá (D. Chase and A. Chase 1982). Locally made ceramics began to follow Yucatecan styles (Hammond 1974). D. Chase and A. Chase (1982, p. 610) have suggested that Nohmul represents a “Chichén” phenomenon, corresponding to Ball’s (1979, p. 51) “model of eastern Puuc-Chichén-Itzá competitive conflict.” Masson (2000, p. 4) characterized the Terminal Classic–Early Postclassic in northern Belize as an “unstable, volatile period,” and these findings suggest that warfare and invasion were important in the Terminal Classic despite other evidence of peaceful information exchange and trade.

There are 80 sites in the Three Rivers area, including large ones like La Milpa and Rio Azul. According to Adams et al. (2004, p. 336), the Terminal Classic collapse there was the last of three large disasters caused by drought and famine (ca. A.D. 150, 530, and 850). These investigators argue for a roughly 50-year interval after A.D. 850 when occupation was very low. During that interval, forest regenerated and new populations reoccupied many sites, using new technologies for the more forested environment. From a peak regional population around A.D. 680–610, population dropped to about 10% by the Early Postclassic (ca. A.D. 900–1250). There is disagreement about whether extensive Terminal Classic midden-like deposits at Dos Hombres, Chan Chich, and Blue Creek represent evidence of squatters or are termination deposits (Clayton et al. 2005; Guderjan 2004).

The coastal sites of Northern River Lagoon (NRL) and Saktunja produced salt and served as transshipment sites. They may have been affiliated with or settled by Colha elites around the time of evidence of violence there (e.g., the skull pit ca. A.D. 800; see Massey 1989; Mock 2005a, p. 121). In the Terminal Classic there was an increase in forms and types that might be related to new food preparation, new people, or an attempt by a variety of groups to symbolize their identities or to make ancestral claims to territory (Mock 2005a, p. 130). Saktunja was occupied until about A.D. 1300, although NRL was abandoned abruptly ca. A.D. 950, possibly as a result of warfare (Mock 2005b, p. 427).

The variety of changes at northern Belizean sites exemplifies the fragmentation of regional cohesion in the Terminal Classic. While evidence of invasion and violence appears certain at some sites, continuity and the lack of such evidence at sites like Lamanai suggest more peaceful relationships with outsiders. Yucatán affiliations, especially with coastal sites (e.g., Tulum and El Meco) are evident in the ceramics (Lincoln 1986, 1991; Pollock et al. 1962), but for the most part these influences were absorbed into existing stylistic canons rather than completely replacing them.



In the Belize Valley, as in the adjacent regions of the Petén, there seems to have been a leveling of status in the Terminal Classic. Many site cores were abandoned, but on the peripheries of sites occupation continued (Aimers 2004b; Sidrys and Berger 1979; Willey et al. 1965, p. 578). Willey (1973a, p. 101) described Early Postclassic people at Barton Ramie as squatters living on previously abandoned mounds, who produced “crude and slovenly” ceramics and constructed no new buildings. I disagree with his characterization of the ceramics, and Willey (1973a, p. 103) himself documented evidence of Postclassic house construction at Barton Ramie. More than half of the Classic-period population at Barton Ramie was maintained into the Postclassic (A. Chase and Garber 2004; Culbert 1988, p. 84), and excavations at Baking Pot uncovered major renovations of Late Classic architecture associated with Terminal Classic ceramics (Aimers 2003a, b) and even burials (Audet and Awe 2005). Tipu shows vigorous occupation through the Postclassic period to historic times (Aimers 2004b; Graham 1991; Jones et al. 1986; P. Rice 1985a; Simmons 1991), yet many other sites appear to have been abandoned by the early 11th century (e.g., Xunantunich; see Ashmore et al. 2004, p. 314).

Lecount (2005) sees the relatively even distribution of pottery types in elite and commoner contexts at Xunantunich as reflective of a leveling of status in the Terminal Classic. This may represent an attempt by elites to forge ties with commoners in troubled times, a lack of elite control of prestige goods, or an attempt by commoners to establish an identity separate from the elite of the site core. In any case, she argues for increased community consolidation and status leveling in the Terminal Classic. As noted earlier, this appears to be one of the key elements that carried into Postclassic society.

Arlen and Diane Chase, working at Caracol, reached virtually the opposite conclusion based on contextual information provided by trash and ceramics associated with structure abandonment (A. Chase and D. Chase 2004, 2005). There was a vibrant Terminal Classic with a great deal of construction in the site core, as at Lamanai. Occupation continued until about A.D. 895, when there was a rapid abandonment of the site core and evidence of burning and warfare (A. Chase and D. Chase 2004, p. 349). Small populations may have lived at the site until as late as the 12th or even 13th century, based on two carbon dates. In contrast to P. Rice (1987a), who sees Terminal Classic ceramic regionalism, they see more elite interregional contact reflected in the fine ceramics of the Terminal Classic than in the Late Classic, which they view as a period of “small-scale regionalization” (A. Chase and D. Chase 2004, p. 362). This may reflect a growing distinction in the Terminal Classic between elites and commoners and an attempt by Terminal Classic elites to associate on a very broad geographical scale (see e.g., Ringle et al. 1998). This idea is somewhat reminiscent of class conflict hypotheses (Satterthwaite 1936, 1937; Thompson 1954), although it is incorporated into a multivariate explanation of collapse at Caracol.

Belize Valley sites have not yet provided evidence of invasion like Nohmul or Colha, although stylistic change was great compared to earlier periods (Aimers 2004b). The introduction of grater dishes and griddles suggests changes in cuisine that can be reasonably related to the physical presence of people with ties to central Mexico (Aimers 2004b; Fry 2003, p. 86; Ringle et al. 1998, p. 215). Ceramic styles

related to northern Belize, Yucatán, and the Gulf Coast do not definitely indicate foreign presence, but they show that the people of the Belize Valley were familiar with exotic styles and did not hesitate to adopt them. This was also the case in the nearby Xibun Valley, where northern influences in ceramics and architecture (circular structures) appeared in the Terminal Classic (McAnany et al. 2005).

Work in southern Belize is rarer (Leventhal 1990), but Abramiuk (1999) suggests that Ek Xux in the Maya Mountains was abandoned due to population pressure and a shortage of arable land. Pusilhá collapsed in the eighth century, although there may have been limited occupation as late as A.D. 1000 (Braswell 2001; Maguire et al. 2003).

### The nature of the Maya collapse

Given the great interregional and intersite variability described above, an important issue is what people mean when they use the term collapse. Collapse can be defined as the end of a “great tradition” (Cowgill 1988, p. 256; Redfield and Singer 1954). In this dramatic and rare form of collapse (exemplified by Mesopotamia), religious systems, political ideologies, and languages disappear (Yoffee 1988). In most cases of collapse, however, various institutions change differently. Some forms of organization disappear, some are transformed, but others may not change at all (Eisenstadt 1988, p. 236; see also Aimers 2004b, p. 184; Stein 2002). For example, D. Chase and A. Chase (2006) have used a “frame” analysis to look at changes in different segments of Maya society between the Classic and Postclassic eras. They see greater change in some aspects of Maya life after the Terminal Classic than in others. For example, they suggest a return to “symbolic egalitarianism” as part of a renewed corporate strategy in the Postclassic but fewer changes in craft specialization and trade (D. Chase and A. Chase 2006, pp. 177, 183).

Tainter (1988, p. 4) suggests that “a society has collapsed when it displays a rapid, significant loss of an established level of sociopolitical complexity.” The collapse in the lowlands as a whole was not “rapid” (although many sites did decline quickly), but it did involve a decline in complexity most noticeable archaeologically in the reduction of monumental construction, writing, and the discontinuation of the Long Count. Farriss (1984) compares this kind of collapse to fragmentation or “crumble.” Yoffee and Cowgill (1988) describe this as the disintegration of a formerly centralized political system into smaller, more independent, and less specialized units, but this may be a temporary situation. Civilizations such as Mesopotamia, Egypt, and China had cycles of “political fragmentation followed by ... reconstitution” (Cowgill 1988, p. 257; see also Aimers 2004b; Yoffee 1979).

Processes of disintegration and regeneration happened repeatedly throughout Maya and Mesoamerican history (Marcus 1989, 1993). A good example is the Late Preclassic–Early Classic transition, which is characterized by site abandonment and other dramatic changes in Maya society in areas as disparate as the Mirador Basin of Guatemala and the Yalahau region of northern Yucatán (Cioffi-Revilla and Landman 1999; Dunning et al. 2002; Fedick and Morrison 2004; Hansen et al. 2002;

Iwaniszewski 2001; Marcus 1993, p. 165; Willey 1974). This “repetitive pattern of growth and decline” (Marcus 1992, p. 392) occurred across Mesoamerica, including the central Mexican highlands, the Zapotec region (Oaxaca), and the northern and southern Maya lowlands. Late Classic Maya changes may have had some connection to the decline of Teotihuacán (see various chapters in Braswell 2003; Diehl and Berlo 1989). Teotihuacán’s central precinct was burned and the site went into decline around A.D. 600–650 (Cowgill 1997), and this disruption could have resulted in both new challenges and new opportunities for the Maya, especially in terms of trade and interregional interaction. Teotihuacán’s decline may be one reason that the Terminal Classic in the Maya lowlands (and what is called the Epiclassic elsewhere) was a period of change throughout Mesoamerica.

### Why were Maya sites abandoned?

Demarest (2004b) and Demarest et al. (2004b) describe two kinds of causes for the abandonment of Maya sites: short-term proximate causes and longer-term structural causes. While archaeologists may be presented with evidence of proximate causes that vary from site to site (e.g., soil erosion or warfare), structural reasons for why so many Maya sites collapsed requires an understanding of the precollapse system (e.g., D. Chase and A. Chase 2006; Lucero 1999; Masson and Freidel 2002; Sharer and Golden 2004). At this point, however, there is still disagreement about the political organization of the ancient Maya (see, e.g., Fox et al. 1996; Iannone 2002). Decentralized models such as peer polity (Freidel 1983, 1986a; Sabloff 1986), “cluster interaction” (Price 1977), and segmentary state (Demarest 1992, 1996a; Dunham 1990; Southall 1988) portray the Classic Maya as weakly integrated politically and vulnerable in the face of a wide range of social and environmental challenges. Others see more complexity and integration in ancient Maya political organization (e.g., A. Chase and D. Chase 2004, 2005), and the collapse may have been the result of failed attempts at further integration (Erasmus 1968). Complexity may be “a problem-solving strategy” (Tainter 1988, p. 195), but this strategy has limits because returns on investment diminish and set the stage for collapse. A possible corollary of this is that sites or regions that were less integrated and hierarchically organized in the Classic period experienced less dramatic collapse, as may have been the case in Bronze Age Syria (Cooper 2006).

Of the many proximate causes of collapse, problems brought on by environmental change and warfare are prominent. War seems to have been most important in the Petexbatun region, whereas the evidence is often ambiguous elsewhere. For example, there is no evidence of war at Xunantunich, although the site is defensible (Ashmore et al. 2004, p. 307; LeCount 2005, p. 96). Warfare may actually encourage population growth rather than reduce it, so this also could have contributed to food shortages and other problems (A. Chase and D. Chase 1989; Cowgill 1964, 1979; Demarest 2004b). As Marcus (1992, p. 392) notes, “warfare, long viewed as a destroyer of Mesoamerican states, was also a creator of states,” and it may have been an old and successful strategy that was unsustainable in the long term (see also D. Webster 1977, 1993, 2000).

Climate change, drought, and other environmental problems have been longstanding interests in Maya archaeology (Huntington 1924; Sapper 1931), but they have been controversial. Sanders (1973), Culbert (1977), and Hansen et al. (2002) argue that only a general environmental deterioration can explain the widespread nature of the collapse in the southern lowlands. Recently, there has been a spate of new publications arguing that the Terminal Classic-Early Postclassic was a time of dry conditions in the Maya area (Folan et al. 1983; Gill 2000; Gunn et al. 1995; Hodell et al. 1995, 2001, 2004, 2005). Some of these works have been criticized for the selective use of data and for inaccurately aligning collapse chronologies (Demarest 2001; Demarest et al. 2004a), but data continue to accumulate and some archaeologists are more convinced than others.

Environmental degradation due to drought could explain characteristics of the collapse such as population reduction and the inability of state institutions to accumulate resources for public works. Moreover, ecological causes explain the decline in both elite and nonelite populations better than purely social ones, even though both causes were probably involved. Like many others, I am becoming persuaded that drought was a major factor in the collapse in some areas (e.g., southern Campeche and Quintana Roo; see Gunn et al. 1995; Siemens et al. 2002; Vargas Pacheco 2002), but I doubt that the effects of drought should be generalized to the entire Maya lowlands (e.g., the Pasion and Petexbatun regions). Coombes (2005) has written a cogent critique of environmental determinism in theories of collapse globally.

Distinguishing anthropogenic versus natural causes for environmental change (e.g., overuse of land vs. drought) is also a difficult issue (e.g., Messenger 1990, pp. 35–37; Popenoe de Hatch et al. 2002). Given that there is no good evidence for either in the Petexbatun region, it is premature to use either of these as a general explanation of lowland site abandonments. A more cautious approach as data accumulate would be to suggest that environmental challenges, whether natural or caused by people, were dealt with more effectively in some areas than others. Given the high population density of the Maya core area in the Late Classic, it is also reasonable to assume that problems in one area could quickly cause problems in others, especially through population movement. Although archaeologists do stress variability in the Terminal Classic lately, in global terms the collapse of so many sites in the Maya core does suggest that problems were more regional than local, as Culbert (1977) has argued. In that light, environmental problems in one area may have been a very important trigger that helped set off a complex chain of events involving others. Nevertheless, when considering collapse generally, the choices people make (or do not make) in situations of crisis may be as important as the crises themselves.

Thus, ideological factors no doubt were involved in the collapse, but they can be difficult to detect archaeologically. Prudence Rice (2004) suggests that competition among sites to host or “seat” 20-year k’atun cycles and the 256-year May cycle led to rivalry and sometimes war (see also A. Chase 1991; Puleston 1979). Even if we never agree on a general reason for the Maya collapse, we can try to understand why ancient Maya leaders in so many cases were unable to resolve the problems they faced at the end of the Classic (Dornan 2004). One way to do this is by looking at sites that did not collapse, like Lamanai.

As in times of collapse in other parts of the world, the people of Lamanai maintained certain elements of Classic culture while abandoning others and adopting new ideas and practices (Graham 2004, 2006; Pendergast 1985b). In the epicentral “Ottawa Group,” Late Classic architectural similarities to Uxmal and Champoton are evident (Graham 2004, p. 236), suggesting that the site’s long-distance contacts began before the collapse of sites elsewhere. A massive Terminal Classic renovation involved the destruction of a stucco frieze concerning rulership (Shelby 1999) and the filling of the associated courtyard with approximately 21,000 metric tons of large boulders (Pendergast 1985b, p. 232). The resulting platform was used to support wooden Postclassic buildings—a rejection of an important tradition in range-type architecture. Yet nearby temple-pyramids were maintained and sometimes renovated, suggesting religious continuity. Inscriptions ceased and carved monuments were sometimes destroyed or reused in Postclassic construction. Yet long-standing stylistic traditions continued to evolve (e.g., in ceramics), albeit with increased exotic elements, suggesting that the site had become even more closely linked to the Mesoamerican “world system” (Aimers 2001). Settlement increasingly focused on the lagoon, suggesting that the site’s importance as a trade center was crucial to its survival.

These changes, among others, may reflect less tolerance for hierarchy and centralization in the Postclassic and an increasingly commercial and collective ethos, but they do not necessarily mean society had become less complex. Someone (or some group) had to organize and direct the massive task of infilling of the Ottawa Group courtyard, for example, and the spectacular Postclassic ceramics of Lamanai could reflect even greater craft specialization than in the Classic period. It is difficult to imagine that Lamanai was not affected by the dramatic changes occurring elsewhere (e.g., 40 km away at Colha), yet people at Lamanai must have made choices that made them much less vulnerable to the instability around them. The flexibility created by human agency is probably why total societal collapse is so rare in world history.

## Timing

Catastrophic processes have often been evoked to account for the collapse because it occurred quickly at many sites and it appears sudden in terms of the temporal scale of archaeology. We now know, however, that the period of site abandonment in the lowlands spans over three hundred years, from about the mid/late eighth century in the Petexbatun (Demarest 2004a) to at least the mid/late 11th century at Chichén Itzá (see Bove 1981; Kvamme 1990; Premo 2004; Simmons 1995; Whitley and Clark 1985; Williams 1993). Half a century ago, Proskouriakoff (1955) suggested that the fall of Mayapán in the 15th century represented the true end point of a long Maya decline, and although we have a much different view of the ancient Maya now, this idea seems more reasonable today, not less. Longer-term, multifactor processes lack the elegance and popular appeal of catastrophic ones, but given that the process of collapse, decline, or transformation in the lowlands took centuries and did not occur at all at some sites, the processes we might invoke are less dramatic.

Evidence for rapid causes of population decline, including widespread disease, is negligible where it has been sought (e.g., Ashmore et al. 2004, p. 307). Although mass migrations out of the southern lowlands (forced or voluntary) are not currently supported with good data, smaller migrations of various sorts are virtually certain, and the long-term effects of these migration streams could have been substantial. Any number of interlinked factors, including a degraded natural environment, disease, internal social problems, and war, may have prompted people to move; this is a common pattern among the Maya historically (Farriss 1984, p. 72). There was Terminal Classic immigration into the Petén lakes region, possibly from the Petexbatun region or the Pasión River area (D. Rice et al. 1998; see also D. Rice 1986; P. Rice and D. Rice 2004). The Mopán drainage of Guatemala also experienced substantial in-migration in the Terminal Classic (Juan Pedro Laporte, personal communication, 2002). Demarest (2004a) speculates on the impact of Terminal Classic emigration from the Petexbatun region on other areas of the lowlands (see also Demarest and Escobedo 1998). There is now little doubt that the Terminal Classic and Early Postclassic periods together were a time of complex interregional movement (Adams et al. 2004; Andres and Pyburn 2004; A. Chase and P. Rice 1985; Masson and Mock 2004), and migration is a normal part of collapse. Thus, it appears that in studies of the Terminal Classic to Postclassic periods, invasion is “out” while immigration is “in.” This reflects a global trend in archaeological thought, but much more remains to be done toward archaeologically identifying the varying forms of population movement in Mesoamerica (Aimers 2004; Lange 2003; Ryder 1977; Yaeger et al. 2004).

### What collapsed?

Because societies are not bounded, unitary entities, collapses are rarely total and continuity is a normal part of collapse (D. Chase and A. Chase 2006; Sharer 1991). At the end of the Classic period, the institution of divine kingship and many of the well-known markers of elite culture such as carved stelae (Sidrys and Berger 1979) and hieroglyphic polychromes (Ball 1993) ended, but Maya civilization continued in modified form with many important features intact (e.g., literacy, war, art, the production of fine ceramics). In some cases large buildings were constructed in the Postclassic period, but the transition to the Early Postclassic era is distinctive for a decrease in elite goods and contexts. The variability in artifact changes during the Terminal Classic and into the Postclassic, even within artifact classes (e.g., fine vs. unslipped ceramics), suggests weaker centralized control than during the Classic period. Site abandonments in the Terminal Classic indicate the collapse of the functional ability of Maya states, but sites that survived show that Maya civilization continued albeit without divine kingship and much of the spectacle around it. This may have been beneficial to ordinary Maya, who appear to have been increasingly burdened from at least the Late Preclassic on by a growing elite sector and its demands such as service in war (Sanders 1973). A similar scenario has been proposed for the Mycenaean collapse (Tainter 1988, p. 204).

Lowland sites that survived into the Postclassic were often located on rivers, lakes, and coasts, presumably for canoe trade and aquatic resources, and were frequently associated with other desirable goods like cacao (Aimers 2004b, pp. 63–65; Andres and Pyburn 2004; Andrews 1990b; Andrews and Vail 1990; Masson 2000; Masson and Mock 2004; McKillop 1987; McKillop and Healy 1989; Rosenswig and Masson 2002). On the coasts of the peninsula, trade may have been stimulated by Chichén Itzá (Andrews et al. 1989; Gallareta Negron 1998; Kepecs et al. 1994; Peraza Lope 1999). Trade has been considered a central factor in the regeneration of complexity after collapse elsewhere as well (see e.g., McCormick 2001; Pirenne 1925).

Artifacts of the Terminal Classic–Early Postclassic, notably ceramics and architecture, are often stylistic hybrids of exotic motifs and styles with local traditions. The production and consumption of pottery were reduced in many places, but the decline in quality was not as steep as has been suggested (Dunham 1990, p. 574; Sharer and A. Chase 1976, p. 288). Unslipped wares increased relative to slipped wares, and most pottery was more variable than in the Classic, but fine pottery was still produced with a new emphasis on modeling, carving, and incising over polychromy. Powerful people may have been less so than in the Classic, but they continued to symbolize their power (in part) through fine pottery, albeit using a newer, multiregional symbolism (Aimers 2004b, p. 191; P. Rice 1985b).

### **The end and the beginning**

It seems unlikely that we will ever find a “silver bullet” that explains the collapse, except perhaps at individual sites. Most archaeologists now use multivariate models that involve the interplay of a number of factors, most notably problems with food/water supply (whether from drought, erosion, or population increase), war, and a political and ideological system that may have exacerbated these and did not respond effectively to crisis (e.g., Demarest 2004b; Lucero 2002; Sharer and Traxler 2006; Webster 2002). In many ways these models are reminiscent of various “systems simulations” of the collapse, although evidence of war was not as clear when they were popular and is perhaps underemphasized in them (Hosler et al. 1977; Lowe 1980, 1982, 1985). Another factor that is being more systematically considered is population movement, which can explain how the crisis of collapse could have spread (McAnany 1990; D. Rice and P. Rice 1990). I believe we might also continue profitably to compare what we know of events and processes in the Maya lowlands from A.D. 750 to A.D. 1050 with collapses elsewhere for new sources of inspiration (Adams and Smith 1977; A. Chase and D. Chase 2004, p. 366; Sharer 1982).

Asking “Why did the Maya collapse?” is rather like asking “Why did the Maya disappear?” Answers are difficult because the questions are inappropriate. The millions of Maya alive today are the descendents of a civilization that did not collapse at the end of the Classic, although it was transformed to varying degrees, in different places, at different times. The task ahead is not to seek simple answers to simple questions but to weave together the diverse strands of those transformations

into a complex whole. When we give ourselves enough distance from our individual sites and regions, we will begin to see the patterns and processes that set the stage for both continuity and change in the Maya lowlands in the centuries following A.D. 750. After nearly a century, it seems we have just begun.

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