

CHAPTER NINETEEN

THE MAYA CITY OF CARACOL, BELIZE

The integration of an anthropogenic landscape



*Arlen F. Chase, Diane Z. Chase, and
Adrian S. Z. Chase*

Our understanding of ancient Maya cities in the southern Lowlands has changed rapidly since 2009, when the first aerial LiDAR record was gained for the site of Caracol, Belize and its surrounding landscape (see chapter by Garrison on LiDAR and other survey techniques). Before these LiDAR data, most Maya sites had been generally conceptualized in terms of models that contrasted an undefined agricultural “sustaining area” with a non-agricultural Maya core monumental architecture characterized by large central plazas, temples, and palaces. Archaeologists were often unsure of both the boundaries and the sizes of ancient settlements that were obscured within deep jungle or sometimes destroyed by modern settlement.

For almost two centuries, researchers have debated the complexity of ancient Maya society. Much of this conversation focused on whether the ancient Maya were actually urban (see Chase, Chase, and Haviland 1990 and Hutson 2016: 30–41 for background). Early works in the 1800s generally tended to portray the Maya as living in cities, but this changed in the early 1900s with the introduction of a model of rural Maya living around vacant ceremonial centers that were used predominantly for ritual gatherings (see Becker 1979 for a history of shifting views). In spite of a significant amount of archaeological data to the contrary, this model caught the popular imagination through works like those of J. Eric S. Thompson (1954, 1970) and the Maya became characterized as a peaceful agricultural people ruled by priests. More recent archaeological research has been able to dispel this characterization of the past, but many current researchers, either knowingly or unknowingly, still retain portions of this earlier world view in their writings.

Apart from LiDAR, other significant advances in Maya archaeology within the last 50 years have been achieved by the breakthroughs in Maya epigraphy that have enabled us to talk about ancient individuals and dynasties and to understand some of the political relationships during the Maya Classic Period from 550 through 900 CE (Martin and Grube 2000). Yet, epigraphic interpretation also restricted our views of the ancient Maya because the majority of the hieroglyphic texts came from a limited number of sites, recorded mainly the lives of the elite and their personal histories, and placed these histories within religious and ritual cosmologies.

The realm of economics was largely absent from these texts and researchers tended to reflect this by noting that the ancient Maya did not have complex economies. Ethnohistorians noted that marketing was generally absent in the Maya Lowlands (e.g., Farriss 1984: 156). In the absence of markets, archaeologists viewed palaces as comprising the backbone of redistributive Maya economies (Foiás 2013: 139; Inomata and Houston 2001: 10; McAnany 1993: 81; Webster 2001: 144–148). Epigraphers and some archaeologists focused on a tribute-tax institution in the absence of venues for physical exchange (Foiás 2013: 139–144; McAnany 2010: 269–304; Stuart 2006: 127–128). Residential households were viewed as being self-sustaining, and elite interaction and exchange were believed to have taken place within ever increasing realms of political patronage and fiefdoms. Yet, continued archaeological work is contradicting this view, indicating that the Maya were economically complex and that all segments of their society used markets extensively (e.g., A. Chase and D. Chase 2015; D. Chase and A. Chase 2014a; Hutson 2017; King 2015; Masson and Freidel 2012).

We began formal archaeological research at Caracol, Belize in 1985. Our original research goal was to explore the relationships that existed between archaeology and history, following up on our work at the Postclassic capital of Santa Rita Corozal in northern Belize (D. Chase and A. Chase 1988). In order to accomplish this, we attempted to find new texts and to discover dated archaeological deposits that could be compared with the hieroglyphic and dynastic records from the site (Beetz and Satterthwaite 1981; Houston 1987). In this endeavor, we have been quite successful, discovering new monuments, correlating dated tombs with ceramic sequences, and discovering that residential caches were deposited according to a temporal, 20-year cycle and can be stylistically dated. We have been able to demonstrate how the city of Caracol both developed over time and functioned as an urban system (D. Chase and A. Chase 2017). Here, we summarize what we generally know about Caracol “the city” (Figure 19.1) and its urban landscape after 35 years of excavation and research.

CARACOL THE CITY: ENVIRONMENT

The Maya city of Caracol is located in the Vaca Plateau of Belize some 50 kilometers south of the modern urban center of San Ignacio Cayo. The site is situated in the foothills of the Maya Mountains at an elevation of 450 to 600 m above sea level and receives 2000 to 2400 mm of rain annually (A. Chase et al. 2014a). Heavy periods of rain occur from May through July and again from November through January. The climate of the Vaca Plateau ranges from 6 to 39 degrees Centigrade with generally cooler nights because of the elevation. The Vaca Plateau is characterized by a karst landscape covered with hills and valleys that is somewhat less severe in terms of topographic changes – largely because of the anthropogenic terracing that covers everything – than areas to its north, south, and east (across the Chiquibul River). More level terrain that mimics a river valley drainage area extends from east to west across the northern part of the Vaca Plateau; however, except for monsoon-like downpours in which water flows westward towards the Macal River, most rain water disappears into vertical sinks in the underlying limestone that feed deep underground water levels. The only standing water that occurs in the Vaca Plateau is found in ancient human-made reservoirs or human-modified *aguadas* (natural depression that hold

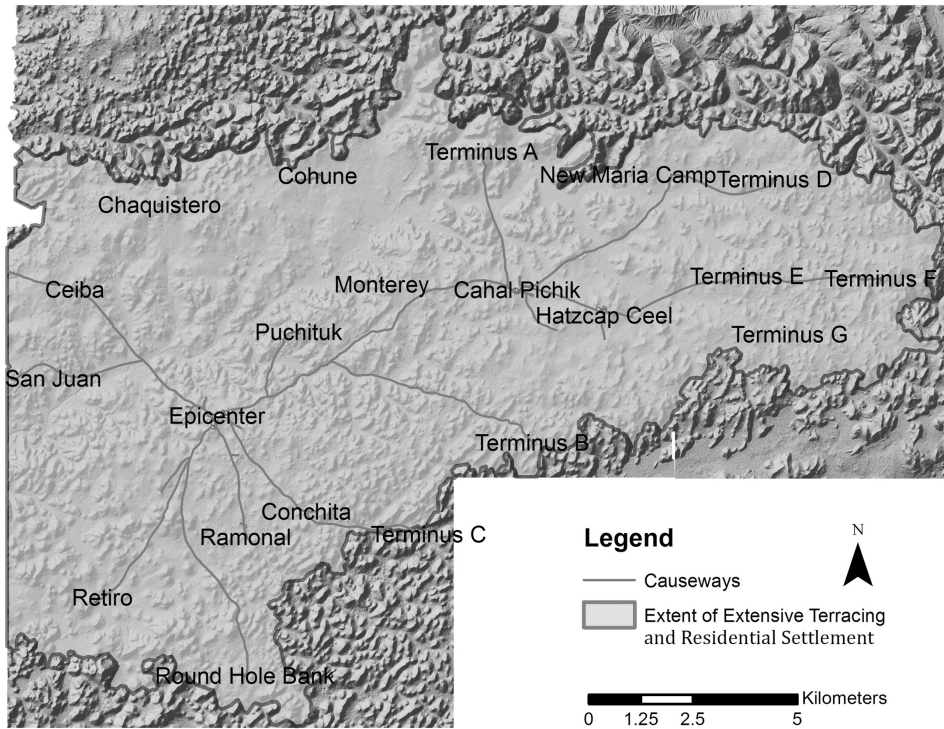


Figure 19.1 The Maya city of Caracol, Belize showing the limits of the metropolitan area, the distribution of its public architecture, and its internal causeway system.

water). Yet, major rivers exist 15 kilometers both to the west (Chiquibul River) and to the east (Macal River) of the site epicenter; ancient Caracol appears to have occupied an area of favorable topography between these two rivers.

The Macal River east of Caracol runs along a natural north-south fault line between sedimentary limestone rock to the west and metamorphic rock, characterized by granite and shale, to the east. Thus, while the Vaca Plateau with its limestone underpinnings supported an over 30-meter-high broad-leaf canopy and fairly deep black soils, the metamorphic land to the east of the Macal River was generally characterized by a pine forest and poorer soils. We suspect that the ancient site of Caracol developed in the Vaca Plateau for two primary reasons: (1) the area had good soils and extensive rainfall; and, (2) the Vaca Plateau formed a natural overland corridor from east to west across this part of the southern Lowlands that permitted easy access to the metamorphic (granite and slate) and arboreal resources (pine and copal) found in the Maya Mountains. These resources were desired by other peoples in the limestone-dominated Lowlands of the Guatemalan Peten.

The initial settlers in the Caracol area, who appeared around 600 BCE, were technologically knowledgeable. Because of the lack of standing or running water in the area, they had to have known how to construct reservoirs that would hold drinking water year-round. Initially, large reservoirs were primarily associated with concentrations of monumental architecture within the Vaca Plateau. But, by the Late

Classic Period, smaller constructed reservoirs (over 1600 examples) provided water for the city and were widely distributed over the landscape in association with residential groups (ASZ Chase 2016). No Caracol resident needed to go more than 200 meters to obtain potable water.

The original inhabitants of Caracol also appeared to have possessed the knowledge of how to modify their landscape to prevent soil erosion and increase infiltration of rainwater into the soil. As the population increased to its peak of more than 100,000 people by 650–700 CE, natural forest cover was surely decreased because of the increased construction related to settlement and agricultural terraces. They built residential plazuela groups on the landscape, while utilizing extensive agricultural practices; this should have led to soil erosion. However, at an early date, the site's inhabitants also began to construct agricultural terracing – first in the valleys of Caracol and then on the hillsides – to mitigate the effects of erosion and to increase retention of water for agriculture. This ultimately led to the expansion of intensive agricultural practices and to a vested interest in “landesque capital” by the site's residents, as represented in the labor investment in the terraces (see A. Chase and D. Chase 1998; D. Chase and A. Chase 2014b; Chase and Weishampel 2016; Coultas, Collins, and Chase 1994; Healy et al. 1983). By the Late Classic Period, large amounts of soil were actively moved within the urban limits of Caracol as the entire landscape came to be covered in agricultural terracing and residential groups became fixed within these fields. This anthropogenic landscape also controlled the flow of water through the environment so that the terraces were not washed away during monsoonal downpours (Chase and Weishampel 2016).

OVERVIEW OF RESEARCH AT CARACOL, BELIZE

The site of Caracol was surely known to loggers prior to its being officially reported to the Government of Belize in 1937. Thus, it does not appear in much of the early literature about the ancient Maya. The site was deemed to be important by early investigators because of the presence of numerous ancient carved stone monuments, and early research at the site during the 1950s focused on the stelae and texts with the incidental discovery of several tombs by Linton Satterthwaite (Beetz and Satterthwaite 1981) of the University of Pennsylvania and A. Hamilton Anderson (1958) of the Belize Department of Archaeology. In the late 1970s, terraces and some residential groups approximately two kilometers distant from the site epicenter were investigated, leading to the realization that the outlying settlement was incredibly dense and that agricultural terracing covered the landscape (Healy et al. 1983), but there was not yet a sense of how this outlying settlement and agricultural terracing were articulated into an urban landscape.

After preliminary reconnaissance to the site in 1983 and 1984, the Caracol Archaeological Project began an annual program of formal excavation at the city in 1985 (A. Chase and D. Chase 1987; D. Chase and A. Chase 1994, 2017). These investigations took place under a series of different research designs that were always formulated to provide a better understanding of a Maya city. The Maya dates and events that were recorded on Caracol's stone monuments were used as a timeline to evaluate the alignment of historical data with the archaeological record. The discovery of an altar text in 1986 that recorded a star-war (a significant warfare event in

which one center eliminated the other center politically for a lengthy period of time; the “star” is the Venus-sign in the associated hieroglyph) against Tikal, Guatemala – combined with an already known star-war by Caracol against Naranjo, Guatemala – led to an investigation of the results of successful warfare on the city’s population in 1988 and 1989. This research focused on settlement in the southeastern portion of Caracol and excavation of a series of outlying residential groups (e.g., Jaeger 1991), demonstrating that the effects of successful warfare permeated the broader society (A. Chase and D. Chase 1989, 2020a).

A second settlement pattern program in the northeastern part of the city revealed similar timing for the widespread appearance of shrines, tombs, caches, and prestige items accessible to all the city’s residents (D. Chase and A. Chase 2003, 2004). This research led to the definition of a site identity promulgated by a management strategy termed symbolic egalitarianism and identified through shared, but unequal, material culture (A. Chase and D. Chase 2009; D. Chase and A. Chase 2004, 2017). Excavation of epicentral palaces at Caracol in the early 1990s led to the discovery of widespread on-floor deposits that resulted in a long-term secondary focus by the project on the nature of the Classic Maya collapse at the city (A. Chase and D. Chase 2004a, 2005a, 2007, 2020b; D. Chase and A. Chase 2000). This research has been able to show that the widespread symbolic egalitarianism found at Caracol during the Late Classic Period disappeared during the Terminal Classic Period (post AD 800) when the city’s elite had restricted access to material culture that would have previously been available to the rest of the populace.

The settlement pattern work led in two different, but inter-related, research directions, one focused on economics and a second focused on city structure. The existence of imported, ritual, and prestige items, like polychrome ceramics (D. Chase 1998), cache vessels (D. Chase and A. Chase 1998), and obsidian (Johnson 2016) in most of the outlying residential groups led to a desire to know how they had ended up in so many living areas. Additionally, intensive research on the site’s agricultural terraces (A. Chase and D. Chase 1998; Murtha 2009) showed that most of the landscape had been completely rebuilt and covered with these features in order to sustain the population. The interspersed residential groups and agricultural terraces (Figure 19.2) made it difficult to move throughout the city; however, an extensive road system facilitated movement from the outlying areas either to the city center or to the public architecture at the end of each causeway. Intermediate roads to households or neighborhoods are lacking. The causeway termini were investigated and found to have centered around large plazas that functioned both as markets and as outlying administrative units for the city (A. Chase 1998). Their embeddedness in the city landscape helps explain the distribution of goods to the city’s residential groups during the Late Classic Period; each causeway terminus housed a market that controlled the distribution of quotidian, ritual, and prestige items to the city’s inhabitants (A. Chase and D. Chase 2004b; A. Chase et al. 2015; D. Chase and A. Chase 2014a).

The extensive dendritic causeway system identified at the site amid continuous settlement and agricultural terraces also to postulate that a huge urban agglomeration existed in the Vaca Plateau (A. Chase and D. Chase 1994, 2001), but it was only after the acquisition of LiDAR data in 2009 and 2013 that the full structure of the site could be defined (A. Chase et al. 2011, 2014). The LiDAR data strengthened the conclusion that Caracol’s urban districts functioned through urban service

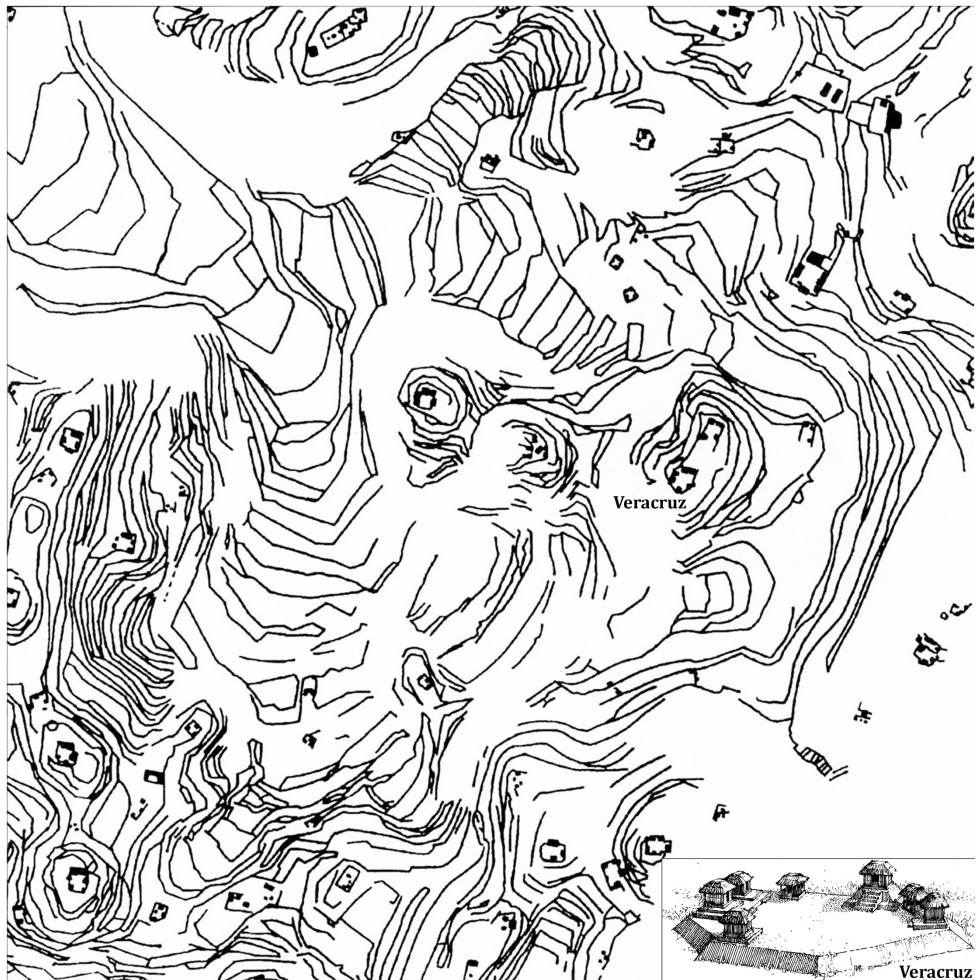


Figure 19.2 Square kilometer of mapped residential groups and agricultural terraces at Caracol, Belize, showing the location of the Veracruz residential group and a reconstruction drawing of it (drawing by Joseph Ballay for Caracol Archaeological Project; see A. Chase and D. Chase 1998 for more information on the mapped square kilometer).

provisioning at the markets and administrative nodes associated with the causeways (A. S. Z. Chase 2016b). And, while the top-down structure could be investigated and defined based on the extensive settlement pattern work that had been carried out, the bottom-up structure was also further researched through the investigation of a multitude of residential groups (e.g., A. Chase and D. Chase 2004b, 2014; D. Chase 1998) that was able to examine how they articulated with the broader system in terms of commerce (A. Chase and D. Chase 2015), agriculture (A. Chase and D. Chase 1998; A. S. Z. Chase and Weishampel 2016), water sources (A. S. Z. Chase 2016a), and neighborhoods (D. Chase and A. Chase 2017). What all of these data have revealed is a largely anthropogenic landscape and a Classic Maya city that was highly integrated, covering some 200 square kilometers (A. Chase and D. Chase

2016a). It has simultaneously demonstrated that urban differences existed within the Maya Lowlands, specifically related to the integration of agriculture into the Maya urban environment (A. Chase and D. Chase 2016b).

As a result of the concentrated research program spanning four decades, Caracol has emerged as a key city in our understanding of the Classic Period Maya southern Lowlands. The city's development was closely tied to the taming of its environment (D. Chase and A. Chase 2014b), which included the creation of an anthropogenic landscape with an integrative road and market system to support a massive metropolitan area. The city's impact on its neighbors also can be seen in the archaeological and hieroglyphic records. Caracol had close interactions with Teotihuacan in central Mexico during the Early Classic, resulting in the interment of an individual according to Teotihuacan burial patterns in a high status residential plaza within the epicenter (A. Chase and D. Chase 2011). Copan's founding ruler appears to have come from Caracol, based both on stable isotope data and on epigraphic texts (Helmke et al. 2018). Closer to home, stone monuments that contain texts relating to Caracol rulers appear both at Naranjo and Ucanal in Guatemala and at Xunantunich in the upper Belize Valley, appearing in all three places presumably as a result of warfare (A. Chase and D. Chase 2020a; Helmke and Awe 2016a, b). Finally, a close and unusual relationship existed between Caracol and Tikal that resulted in Caracol's most important rulers being buried in Tikal's North Acropolis, presumably resulting from the AD 562 Tikal star-war (A. Chase and D. Chase 2020a). Thus, the city impacted both its local landscape and the Classic Maya political order. Future research will continue to flesh out these relationships.

CARACOL THE CITY: PHYSICAL COMPOSITION

We are used to thinking about Maya cities as being focal concentrations of monumental architecture that integrate larger stone-built structures – usually characterized as temples, palaces, and ballcourts – with spacious plazas. If a Maya city had its start during the Late Preclassic era (or earlier), one of these plazas usually conforms to what is called an “E Group” pattern, characterized by a western pyramid and a long eastern platform usually topped with three constructed buildings (A. Chase and D. Chase 2017a; see Brown and Stanton, Chapter 3). Constructed causeways or roads also are often associated with these centers. In the Late Preclassic era, causeways connected concentrations of architecture together over significant distances in the northeastern Peten, binding several sites into the first peer-polity system of Maya states (A. Chase and D. Chase 2020c). In the Late Classic, causeways were used to join monumental nodes of architecture together within a single site; these causeway systems could be either inward-focused, as at Tikal, Guatemala, or outward-focused, as at Coba, Mexico (A. Chase and D. Chase 2003).

Caracol has an outward-focused, dendritic causeway system yet everything converged on the monumental architecture in the site epicenter and particularly on a unique architectural complex, called “Caana,” which likely functioned as the residential compound for the site's rulers (Figure 19.3; A. Chase and D. Chase 2017b). Caracol's causeway system was expansive, linking public architectural nodes up to 14 kilometers east of the site epicenter and 10 kilometers to the west. The Late Classic city of Caracol incorporated intensive terrace agriculture within the urban center;

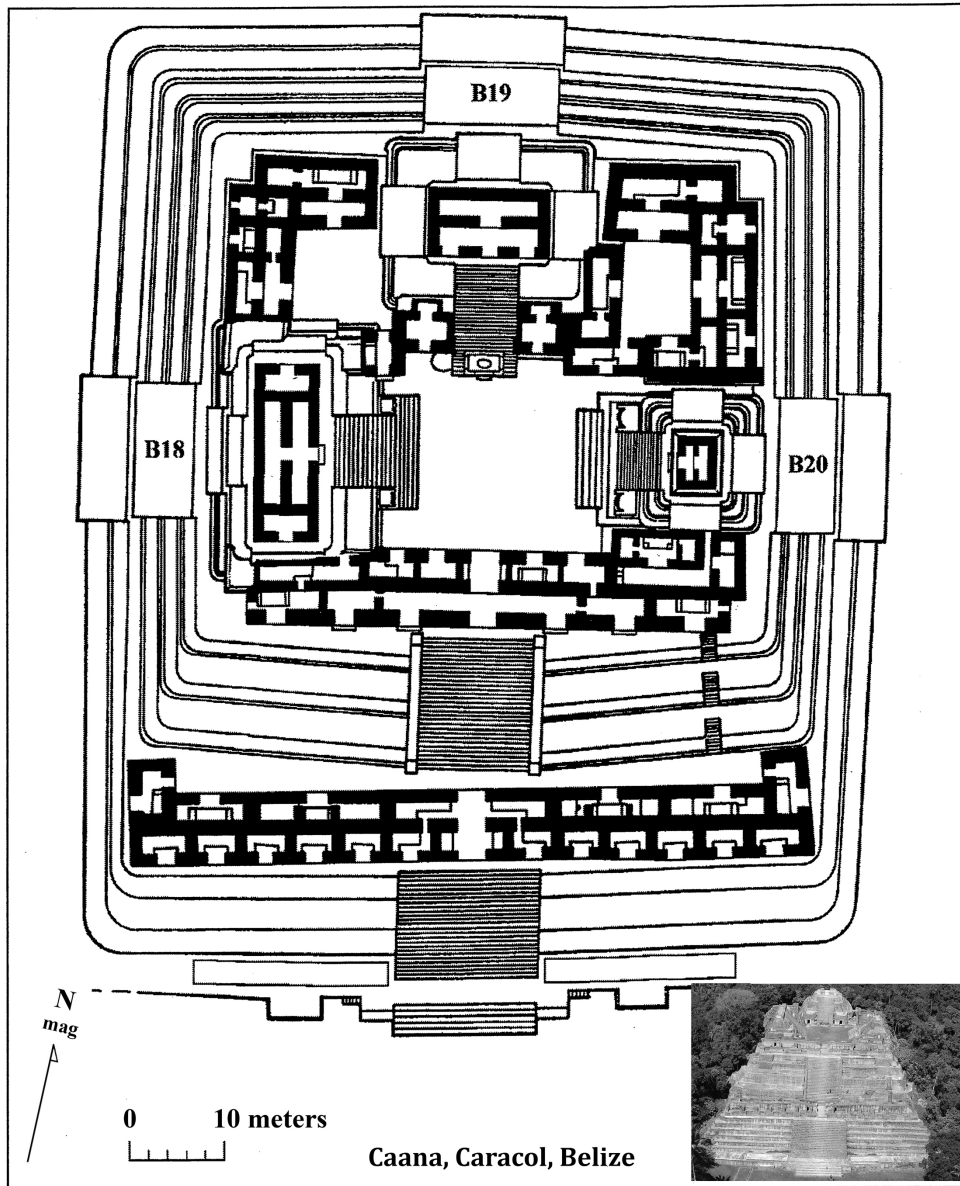


Figure 19.3 Plan of the central architectural complex called “Caana” or “Sky Place” with inset photo of the pyramidal substructure and its associated buildings.

elsewhere this tropical form of urbanism has been referred to as “low-density agricultural urbanism” (Fletcher 2009). At this time, Caracol conservatively supported a population of over 100,000 people (A. Chase and D. Chase 1994; A. Chase et al. 2011; D. Chase and Z. Chase 2017). The highest density metropolitan settlement was distributed around this causeway system but the overall settlement was in the shape

of a football whose long axis runs east/west with a maximum north-south span of 10 kilometers in the middle and narrowing as one got farther away to the east and west from the epicenter. The causeway system effectively linked the vast residential and terraced agricultural system together by providing embedded monumental nodes that were used for administrative and economic purposes (as noted above). The density of residential settlement was higher around the epicenter (e.g., A. Chase et al. 2011: Figure 11) with approximately 70 residential groups per square kilometer; at a distance of 5 kilometers from the epicenter, there were still over 50 residential groups per square kilometer (A. Chase and D. Chase 1998: Figure 7). The average settlement density for Caracol during the Late Classic Period was on the order of 600 people per square kilometer. This estimate presumes that most groups were occupied during the Late Classic (as archaeological research appears to show) and that all residential settlement was comprised of mounded structures (which is unlikely, implying more population; see D. Chase 1990 for issues of “vacant terrain”).

The archaeological excavations that have been undertaken over the last 35 year have provided us with an understanding of how Caracol developed as a city over time. In the Late Preclassic Period, there were many separate communities located within the Vaca Plateau, each centered around their own E Group complexes (La Rejolla, Ceiba, Cohune, Cahal Pichik, Hatzcap Ceel, San Juan, and Caracol proper); all were later engulfed within the boundaries of urban Caracol. By the end of the Late Preclassic, we suspect that a political arrangement had been made between Cahal Pichik, Hatzcap Ceel, and Caracol proper, especially as these three centers were joined together by 12-meter-wide causeways into what was probably the first version of the broader city. By the end of the Early Classic era, this causeway system had expanded to include Retiro, Ceiba, New Maria Camp, and probably La Rejolla and San Juan – and residential settlement and agricultural terracing had begun to infill the landscape. At the beginning of the Late Classic Period, monumental plazas were constructed at Conchita, Ramonal, and Puchituk, forming an inner ring of nodes at a distance of just over 3 kilometers from the epicenter. All three nodes were directly linked by causeways to the site epicenter and were probably built to serve the needs of a burgeoning population (A. Chase and D. Chase 1989). Later causeways, dating to the Late Classic Period, were laid out mostly in the eastern part of the city and reached into the foothills both north and south of Cahal Pichik; they were also constructed outward towards the Macal River, running 3 kilometers east from the Maria Camp terminus and some seven kilometers east from Hatzcap Ceel. The exact order in which these roadways and termini were built has not been determined, but their construction appears to have been a continuing activity throughout Caracol’s history (D. Chase and A. Chase 2014b, 2017). The city’s causeway system would have made it easier to transport potable water from the Macal and Chiquibul Rivers if there were conditions of extreme drought.

The larger plazas that formed the ends of most of the city’s causeways served as economic and administrative nodes for Caracol proper. They were part of a multicentric marketing system at Caracol that helped deliver needed goods to the city’s population. All of the city’s residential groups appear to have had access to these materials. During the Late Classic Period, the causeways facilitated the flow of pottery, obsidian, chert, seashell, jadeite, and perishable items to Caracol’s residential groups. These items would have been available in accessible markets that were

monitored and taxed by Caracol's epicentral elite (A. Chase et al. 2015; D. Chase and A. Chase 2014). The causeway system also facilitated the flow of finished goods that were manufactured in the various residential groups to consumers elsewhere (A. Chase and D. Chase 2015) and further permitted finished and unfinished resources from the Maya Mountains to flow westward into the Peten of Guatemala, presumably in return for other quotidian and prestige objects manufactured throughout the Maya area.

Each residential group at Caracol likely produced a specific item or set of items that could be used to participate in the site's economic system (A. Chase and D. Chase 1994; D. Chase and A. Chase 2004); some groups specialized in embroidery and cloth (A. Chase et al. 2008), others in lithic tools (Johnson 2013; Johnson et al. 2015), and still others in items made of seashell, bone, wood, and other perishable materials (A. Chase and D. Chase 2015). However, by the Late Classic Period, Caracol's inhabitants were largely dependent on exterior suppliers for their pottery, obsidian, fine lithic tools, and other needed household goods. Many of the available goods that would have appeared in the city's markets were produced beyond the city. Based on the sandy tempers and clays and lack of any evidence for pottery production, much of the unslipped utilitarian pottery used by Caracol's inhabitants was manufactured beyond the city's boundaries, possibly along either the Chiquibul or Macal Rivers. The finewares that are found in residential groups also derived from outside suppliers. Belize Red pottery was imported from the Belize Valley (A. Chase and D. Chase 2012; A. S. Z. Chase and A. M. Chase 2015) and other pottery would have come from the Peten and also from points to the south of the site.

While dependent on the city's economic system during the Late Classic Period for most of their goods, each household would have been self-sufficient in terms of their agricultural produce with about 2.2 ha of land per household. The extensive agriculture terracing was also sufficient to support the Late Classic population estimated to have lived at the site and would have continued to be productive for several centuries (Murtha 2009). The settlement and the agricultural terracing are integrated, continuous, and comprise most of the urban imprint of Caracol. For the agricultural terraces to work, the inhabitants in the site's residential groups must have been vested in their upkeep and fertility; it is likely that nightsoil was carried to the fields to fertilize them, that there was multi-cropping on the terraces, and that different crops were likely grown on the terraces in different years. The agricultural terracing also meant that Caracol's inhabitants were strongly tied to and dependent on this form of landscape capital (D. Chase and A. Chase 2014b).

CARACOL THE CITY: SOCIAL COMPOSITION

How ancient Maya cities were socially organized has been a topic of debate for some time. In the late 1500s, Bishop Diego de Landa described Maya centers as being concentrically organized around a central plaza and its public architecture; higher status individuals lived closer to the community center and lower status individuals lived further afield (Tozzer 1941: 62). Even the earliest reconnaissance to analyze ancient Maya settlement patterns in the southern Lowlands disputed this model (see Bullard 1960: 369), but it was and is still actively debated by researchers (see the debate engaged in by Arnold and Ford 1980, 1982; Folan et al. 1982; and Haviland

1982; see also Folan et al. 2009 for a recent restatement of the concentric nature of Maya settlement). Our research at both Caracol and Santa Rita Corozal has not supported the simple concentric model espoused by Landa (A. Chase and D. Chase 2001; A. Chase et al. 2011: Figure 11; D. Chase and A. Chase 1988: 69, 75–76). Rather, this research has demonstrated that both the physical and social organization of Maya cities changed over time (e.g., A. Chase 1992).

What can be said about the social composition of Caracol is that people of different statuses and wealth were intermixed over the entire landscape. The royal family, as represented on the site's stone monuments, occupied the massive epicentral complex of Caana, but other high status families occupied other palace compounds in both the epicenter and at many of the site's market nodes. The individuals associated with mortuary buildings affiliated with these palace compounds all had better diets – higher in both maize and protein – than the bulk of Caracol's population (A. Chase, Chase, and White 2001). Because the majority of Caracol's inhabitants were self-sufficient agriculturally, they also enjoyed good diets (just not as good as the highest elite). However, there were residential pockets near the site epicenter, and presumably near the site's termini, whose inhabitants did not have the best diets; they ate little maize and variable amounts of meat. These individuals may not have been local, perhaps even slaves or prisoners, many of whom were likely engaged in the constant building renovation that was going within the city; they had only limited access to maize, presumably because they were not farming. Other downtown palace workers were locals who were buried in their outlying residential groups at the time of their death; we know this because they ate a different diet (the one associated with palace occupants) during their lifetimes and their stable isotope profile does not match the inhabitants of their family residential groups (A. Chase, Chase, and White 2001).

During the Early Classic Period, a significant gap appears to have existed among Caracol's social groups. Early Classic interments in the epicenter of the site usually contain more funerary items than those found outside the epicenter and there appears to have been a more pronounced wealth dichotomy than was subsequently seen (see A. Chase and D. Chase 2018). Most caches of Preclassic and Early Classic date also are associated with epicentral public architecture, generally occurring in lidded barrels or in large lip-to-lip flaring-walled bowls (A. Chase and D. Chase 2005b, 2006); caches of this early date rarely appear in residential groups and, when they do appear, it seems that they were deposited within a public construction that had been subsumed within a later higher status residential group (e.g., Monterey and Alta Vista residential groups; see A. Chase and D. Chase 2006: 44 for Monterey). What this implies is that the Preclassic and Early Classic social order at Caracol was more hierarchically ordered than during the subsequent Late Classic Period.

The archaeological data from Caracol indicates that social inequality lessened throughout the Classic Period, as can be seen in the sizes of the city's residential households (A. S. Z. Chase 2017). While there were differences among individuals that can probably be ascribed to wealth and status, during the Late Classic Period most Caracol residential groups had access to the same trade goods and ritual practices that were utilized by the site's elite (see A. Chase and D. Chase 2009; D. Chase and A. Chase 2004, 2017). Additionally, the overall inequality reflected in residential group construction volume is lower than expected (A. S. Z. Chase 2017).

During the Late Classic Period, residential groups throughout Caracol had access to the same caching and mortuary practices. While higher status residential groups may have been able to build vaulted structures and larger tombs, lower status residential groups also utilized tombs. Some 70% of Caracol's residential groups evince eastern constructions that were used for mortuary purposes (see D. Chase and A. Chase 2011, 2017). And, even when tombs were not found within the eastern ritual construction, the pottery and jewelry found with non-tomb interments indicates that there was ready access to the site's market system for imported polychrome serving wares and other prestige items among non-elites.

Late Classic caching practices were also similar and widespread among Caracol's residential groups (see D. Chase and A. Chase 1998). During the Late Classic Period, the inhabitants of the city utilized two types of ceramic containers for caches: lip-to-lip small flaring-walled bowls or cups and small lidded urns that often exhibited a modeled face on their exterior wall (Figure 19.4). The smaller lip-to-lip caches are referred to as "finger caches" because they often contain one or more human digits within their enclosed space; occasionally, an obsidian lancet or obsidian blade accompanied the digit(s). The larger urn caches are referred to as "face caches" because of the modeled features; these features minimally consist of two eyes and a nose, but are often supplemented with a mouth, chin, eyebrows, and earrings; sometimes barbels appear at the sides of the mouth, crullers near the eyes, and a edged frame surrounds the face; on earlier examples, this edged frame resembles a flange, while later examples do not exhibit a frame and, indeed, the faces become very rudimentary. Most of the over 120 excavated residential groups at Caracol have yielded one or both kinds of caches in association with the eastern structure. The deposition of finger caches has been associated with a grieving process for individuals interred within the eastern structure. However, the deposition of face caches appears to be associated with broader rituals tied to the celebration of katuns – 20-year periods of time – by the Maya of Caracol (A. Chase and D. Chase 2014). This focus on katun celebrations is also seen in the carved altars of Caracol during the early part of the Late Classic Period (D. Chase and A. Chase under review).

The widespread distribution of shared ritual practices in Caracol's residential groups – especially the focus on eastern shrines and the common use of tombs and formal caches – integrated the broader community (D. Chase and A. Chase 2004). As of the end of the 2018 field season at Caracol, 124 tombs (in 77 different residential groups) and 249 other interments (in 96 residential groups, 47 of which have no tombs) that contained 742 individuals have been investigated. Concerning these 742 individuals recovered at Caracol, 111 of them were associated with teeth inlaid with jadeite and hematite (the actual number of individuals with inlaid teeth would have been larger, given the inclusion – in the sample of 742 – of partial bodies and the presence of older individuals who had lost their teeth). The individuals with inlaid teeth have been recovered in 55 different residential groups and derive from tombs, cists, crypts, and bodies placed directly into the fill of structures. Deciduous teeth had inlays in at least two contexts at Caracol (D. Chase and A. Chase 2017: 221 and 2017 field report (SD C211B-2) at www.caracol.org), so this practice was not restricted to adults. In some cases, the inlays appear to have been ritually removed after death (something also noted at Tikal; Coe 1990: 567). Filed teeth also occur in

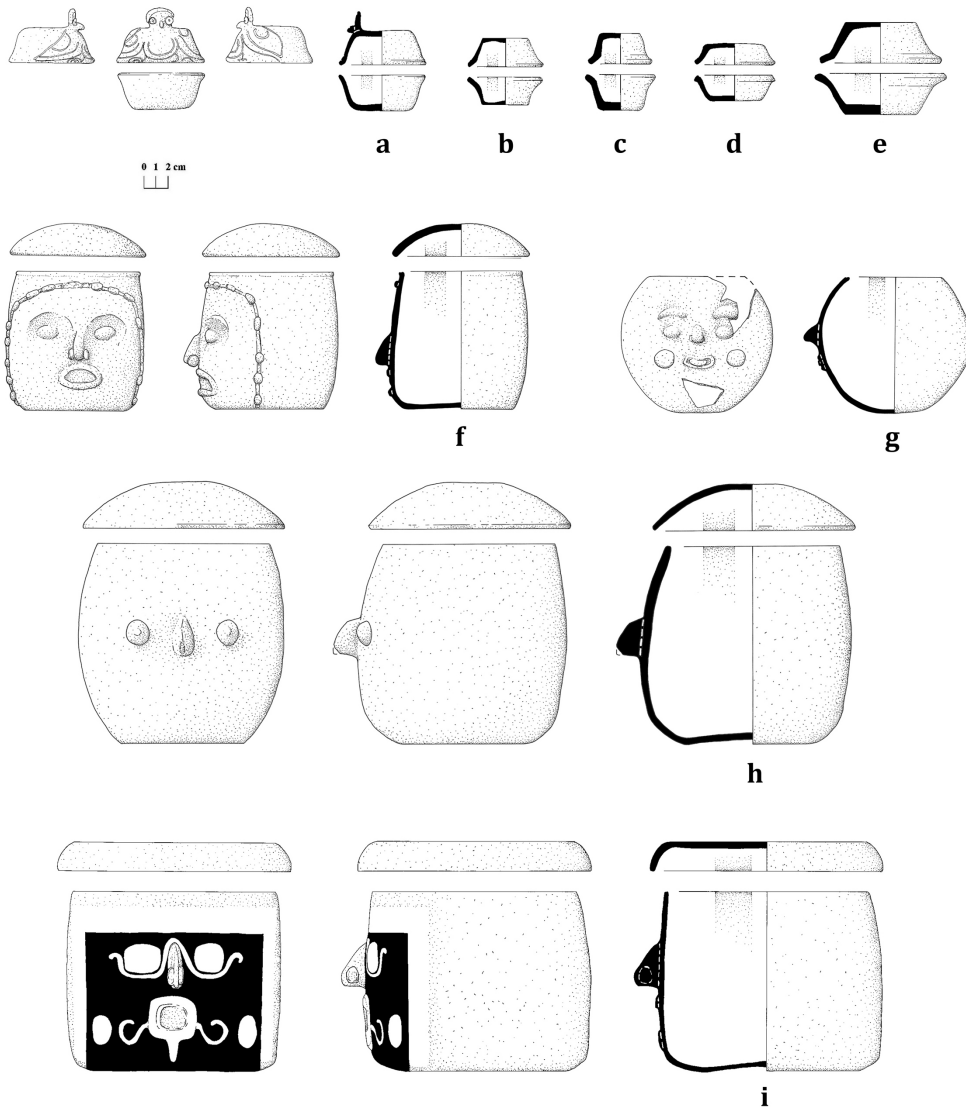


Figure 19.4 Ceramic containers for ritual deposits made at Caracol, Belize: a.–e. “finger” caches (contain human digits); f.–i. “face” caches (some contain obsidian eccentrics).

101 individuals from Caracol in 56 different residential groups (35 residential groups have individuals with both filed and inlaid teeth). While inlaid teeth do occur with some elite individuals from Caracol (A. Chase and D. Chase 2020b), a direct equation between inlays and high status cannot be made. The extensive variability seen in the patterning of decorated teeth at Caracol also was not a direct result of “beautification”; instead, the patterning suggests a complex interrelationship between statuses, roles, and possibly occupations.

Caracol was likely at one end of the spectrum in terms of providing its citizens access to items that were socially restricted within other Maya communities. This strategy of access probably fostered fierce loyalty by the city's inhabitants to the ruling elite and its administration during the Late Classic Period; this is echoed in the relatively low inequality in residential groups found at Caracol compared to other Maya cities (A. S. Z. Chase 2017). Its open policies do not appear to have been applied in other Maya cities, even ones that the Caracol polity directly controlled for approximately 50 years (such as Tikal beginning in 562 CE and Naranjo beginning in 631 CE) as the result of successful warfare in the early part of the Late Classic Period (see A. Chase and D. Chase under review; though see Martin, Chapter 25). Caracol's population continued to enjoy ownership and access to ritual items and quotidian and prestige goods (e.g., symbolic egalitarianism) throughout the Late Classic Period, even after Caracol lost much of its political impact within the broader region because of a successful star-war by Naranjo against the city in AD 680 (D. Chase and A. Chase 2017: 215–216).

CONCLUSION

Without decades of archaeological research, Caracol would not be nearly as well understood as it now is; however, each new field season still holds surprises. Long-term research carried out by the same archaeological project like those at Caracol (D. Chase and A. Chase 2017), Tikal (Sabloff 2003), and Copan (Andrews and Fash 2005) have provided much information for understanding the nature of ancient Maya societies. While LiDAR has ushered in a new era of survey and landscape analysis, it is not a substitute for excavation (e.g., A. Chase et al. 2014c: 218; A. S. Z. Chase, Chase, and Case 2017: 97). Caracol's dendritic causeway system and markets influenced the ancient policy enactment of symbolic egalitarianism. The dispersed urban layout of Caracol enabled the city to thrive on the basis of its internal agricultural production. The city spans such a large area that it offsets rainfall scarcity; because of the topography, at least some areas get rain even when others don't. Finally, Caracol seems to challenge endlessly different narratives and models of Maya civilization. This is likely because many of the previous models about the ancient Maya social order were derived from limited databases. Continuous long-term archaeological research at Caracol over 35 years has amassed a vast quantity of archaeological information that permits more detailed consideration of questions about the nature of ancient Maya society. Future archaeological work in the city will continue to refine our interpretations.

REFERENCES

- Anderson, A. Hamilton 1958 Recent Discoveries at Caracol Site, British Honduras. *Proceedings of the 30th International Congress of Americanists*, pp. 494–499. Copenhagen.
- Andrews, E. Wyllys and William L. Fash (editors) 2005 *Copan: The History of An Ancient Maya Kingdom*. School for Advance Research Press, Santa Fe.
- Arnold, Jeanne and Anabel Ford 1980 A Statistical Examination of Settlement Patterns at Tikal, Guatemala. *American Antiquity* 45: 713–726.
- Arnold, Jeanne and Anabel Ford 1982 A Reexamination of Labor Investments at Tikal: Reply to Haviland, and Folan, Kintz, Fletcher, and Hyde. *American Antiquity* 47: 436–440.

- Becker, Marshall J. 1979 Priests, Peasants, and Ceremonial Centers: The Intellectual History of a Model. In *Maya Archaeology and Ethnohistory*, edited by Norman Hammond and Gordon Willey, pp. 3–20. University of Texas Press, Austin.
- Beetz, Carl P. and Linton Satterthwaite 1981 *The Monuments and Inscriptions of Caracol, Belize*. University Museum Monograph 45. The University Museum, University of Pennsylvania, Philadelphia.
- Bullard, William R. 1960 Maya Settlement Pattern in Northeastern Peten, Guatemala. *American Antiquity* 25: 355–372.
- Chase, Adrian S. Z. 2016a Beyond Elite Control: Residential Reservoirs at Caracol, Belize. *WIRES Water* 3: 885–897.
- Chase, Adrian S. Z. 2016b Districting and Urban Services at Caracol, Belize: Intrasite Boundaries in an Evolving Maya Cityscape. *Research Reports in Belizean Archaeology* 13: 15–28.
- Chase, Adrian S. Z. 2017 Residential Inequality among the Ancient Maya: Operationalizing Household Architectural Volume at Caracol, Belize. *Research Reports in Belizean Archaeology* 14: 31–39.
- Chase, Adrian S. Z. and Aubrey M. Z. Chase 2015 Ceramic Standardization and the Domestic Economy of the Ancient Maya: Belize Red Tripod Plates at Caracol, Belize. *Research Reports in Belizean Archaeology* 12: 65–76.
- Chase, Adrian S. Z., Diane Z. Chase, and Arlen F. Chase 2017 LiDAR for Archaeological Research and the Study of Historical Landscapes. In *Sensing the Past: From Artifact to Historical Site*, edited by Nicola Masini and Francesco Soldvieri, pp. 89–100. Springer, New York.
- Chase, Adrian S. Z. and John F. Weishampel 2016 Using LiDAR and GIS to Investigate Water and Soil Management in the Agricultural Terracing at Caracol, Belize. *Advances in Archaeological Practice* 4: 357–370.
- Chase, Arlen F. 1992 Elites and the Changing Organization of Classic Maya Society. In *Mesoamerican Elites: An Archaeological Assessment*, edited by Diane Z. Chase and Arlen F. Chase, pp. 30–49. University of Oklahoma Press, Norman.
- Chase, Arlen F. 1998 Planeacion Civica e Integracion de Sitio en Caracol, Belice: Definiendo una Economia Administrada del Periodo Clasico Maya. *Los Investigadores de la Cultura Maya* 6(1): 26–44 (Universidad Autonoma de Campeche, Campeche).
- Chase, Arlen F. and Diane Z. Chase 1987 *Investigations at the Classic Maya City of Caracol, Belize: 1985–1987*. Monograph 3. Pre-Columbian Art Research Institute, San Francisco.
- Chase, Arlen F. and Diane Z. Chase 1989 The Investigation of Classic Period Maya Warfare at Caracol, Belize. *Mayab* 5: 5–18.
- Chase, Arlen F. and Diane Z. Chase 1994 Details in the Archaeology of Caracol, Belize: An Introduction. In *Studies in the Archaeology of Caracol, Belize*, edited by D. Z. Chase and A. F. Chase, pp. 1–11. Monograph 7. Pre-Columbian Art Research Institute, San Francisco.
- Chase, Arlen F. and Diane Z. Chase 1998 Scale and Intensity in Classic Period Maya Agriculture: Terracing and Settlement at the “Garden City” of Caracol, Belize. *Culture and Agriculture* 20(2): 60–77.
- Chase, Arlen F. and Diane Z. Chase 2001 Ancient Maya Causeways and Site Organization at Caracol, Belize. *Ancient Mesoamerica* 12(2): 273–281.
- Chase, Arlen F. and Diane Z. Chase 2003 Minor Centers, Complexity, and Scale in Lowland Maya Settlement Archaeology. In *Perspectives on Ancient Maya Rural Complexity*, edited by Gyles Iannone and Samuel V. Connell, pp. 108–118. Monograph 49. The Cotsen Institute of Archaeology, University of California, Los Angeles.
- Chase, Arlen F. and Diane Z. Chase 2004a Terminal Classic Status-Linked Ceramics and the Maya “Collapse:” *De Facto* Refuse at Caracol, Belize. In *The Terminal Classic in the*

- Maya Lowlands: Collapse, Transition, and Transformation*, edited by Arthur A Demarest, Prudence Rice, Don Rice, pp. 342–366. University of Colorado Press, Boulder.
- Chase, Arlen F. and Diane Z. Chase 2004b Exploring Ancient Economic Relationships at Caracol, Belize. *Research Reports in Belizean Archaeology* 1: 115–127.
- Chase, Arlen F. and Diane Z. Chase 2005a Contextualizing the Collapse: Hegemony and Terminal Classic Ceramics from Caracol, Belize. In *Geographies of Power: Understanding the Nature of Terminal Classic Pottery in the Maya Lowlands*, edited by Sandra Lopez Varella and Antonia Foias, pp. 73–91. BAR Monograph S1447, Oxford.
- Chase, Arlen F. and Diane Z. Chase 2005b The Early Classic Period at Caracol, Belize: Transitions, Complexity, and Methodological Issues in Maya Archaeology. *Research Reports in Belizean Archaeology* 2: 17–38.
- Chase, Arlen F. and Diane Z. Chase 2006 Before the Boom: Caracol's Preclassic Era. *Research Reports in Belizean Archaeology* 3: 41–67.
- Chase, Arlen F. and Diane Z. Chase 2007 “This is the End”: Archaeological Transitions and the Terminal Classic Period at Caracol, Belize. *Research Reports in Belizean Archaeology* 4: 13–27.
- Chase, Arlen F. and Diane Z. Chase 2009 Symbolic Egalitarianism and Homogenized Distributions in the Archaeological Record at Caracol, Belize: Method, Theory, and Complexity. *Research Reports in Belizean Archaeology* 6: 15–24.
- Chase, Arlen F. and Diane Z. Chase 2011 Status and Power: Caracol, Teotihuacan, and the Early Classic Maya World. *Research Reports in Belizean Archaeology* 8: 3–18.
- Chase, Arlen F. and Diane Z. Chase 2012 Belize Red Ceramics and Their Implications for Trade and Exchange in the Eastern Maya Lowlands. *Research Reports in Belizean Archaeology* 9: 3–14.
- Chase, Arlen F. and Diane Z. Chase 2014 Houses, Households, and Residential Groups at Caracol, Belize. *Research Reports in Belizean Archaeology* 11: 3–17.
- Chase, Arlen F. and Diane Z. Chase 2015 The Domestic Economy of Caracol, Belize: Articulating with the Institutional Economy in an Ancient Maya Urban Setting. *Research Reports in Belizean Archaeology* 12: 15–23.
- Chase, Arlen F. and Diane Z. Chase 2016a Urbanism and Anthropogenic Landscapes. *Annual Review of Anthropology* 45: 361–376.
- Chase, Arlen F. and Diane Z. Chase 2016b The Ancient Maya City: Anthropogenic Landscapes, Settlement Archaeology, and Caracol, Belize. *Research Reports in Belizean Archaeology* 13: 3–14.
- Chase, Arlen F. and Diane Z. Chase 2017a E Groups and the Rise of Complexity in the Southeastern Maya Lowlands. In *Maya E Groups: Calendars, Astronomy, and Urbanism in the Maya Lowlands*, edited by David A. Freidel, Arlen F. Chase, Anne Dowd, and Jerry Murdock. University Press of Florida, Gainesville.
- Chase, Arlen F. and Diane Z. Chase 2017b Ancient Maya Architecture and Spatial Layouts: Contextualizing Caana at Caracol, Belize. *Research Reports in Belizean Archaeology* 14: 13–22.
- Chase, Arlen F. and Diane Z. Chase 2018 Contextualizing the Preclassic and Early Classic Periods at Caracol, Belize. *Research Reports in Belizean Archaeology* 15: 3–15.
- Chase, Arlen F. and Diane Z. Chase 2020a The Materialization of Classic Period Maya Warfare: Caracol Stranger-Kings at Tikal. In *A Forest of History: The Maya after the Emergence of Divine Kingship*, edited by Travis Stanton and M. Kathryn Brown, University Press of Colorado, Boulder.
- Chase, Arlen F. and Diane Z. Chase 2020b Scale and Political Integration in Ancient Maya Polities: Ideology, Frame Analysis, and Caracol, Belize. In *Regimes of the Classic Maya: Toward an Archaeology of Political Communities*, edited by Marcello Canuto and Maxime Lemoureaux St-Hilaire. Cambridge University Press, Cambridge.

- Chase, Arlen F. and Diane Z. Chase under review The Transformation of Maya Rulership at Caracol, Belize. In *Rupture or Transformation of Maya Kingship? From Classic to Postclassic Times*, edited by Tsubasa Okoshi, Arlen F. Chase, Phillippe Nondedeo, and M. Charlotte Arnauld, University Press of Florida, Gainesville.
- Chase, Arlen F., Diane Z. Chase, Jaime J. Awe, John F. Weishampel, Gyles Iannone, Holley Moyes, Jason Yaeger, and M. Kathryn Brown 2014c The Use of LiDAR in Understanding the Ancient Maya Landscape: Caracol and Western Belize. *Advances in Archaeological Practice* 2(3): 208–211.
- Chase, Arlen F., Diane Z. Chase, Jaime J. Awe, John F. Weishampel, Gyles Iannone, Holley Moyes, Jason Yaeger, M. Kathryn Brown, Ramesh L. Shrestha, William E. Carter, and Juan Fernandez Diaz 2014b Ancient Maya Regional Settlement and Inter-Site Analysis: The 2013 West-Central Belize LiDAR Survey. *Remote Sensing* 6(9): 8671–8695.
- Chase, Arlen F. Chase, Lisa J. Lucero, Vernon Scarborough, Diane Z. Chase, Rafael Cobos, Nicholas Dunning, Joel Gunn, Scott Fedick, Vilma Fialko, Michelle Hegmon, Gyles Iannone, David L. Lentz, Rodrigo Liendo, Keith Prufer, Jeremy A. Sabloff, Joseph Tainter, Fred Valdez, and Sander van der Leeuw 2014a Tropical Landscapes and the Ancient Maya: Diversity in Time and Space In *The Resilience and Vulnerability of Ancient Landscapes: Transforming Maya Archaeology through IHOPE*, edited by Arlen F. Chase and Vernon Scarborough, pp. 11–29. American Anthropological Association, Arlington.
- Chase, Arlen F., Diane Z. Chase, Richard Terry, Jacob M. Horlacher, and Adrian S. Z. Chase 2015 Markets among the Ancient Maya: The Case of Caracol, Belize. In *The Ancient Maya Marketplace: The Archaeology of Transient Space*, edited by Eleanor King, pp. 226–250. University of Arizona Press, Tucson.
- Chase, Arlen F., Diane Z. Chase, John F. Weishampel, Jason B. Drake, Ramesh L. Shrestha, K. Clint Slatton, Jaime J. Awe, and William E. Carter 2011 Airborne LiDAR, Archaeology, and the Ancient Maya Landscape at Caracol, Belize. *Journal of Archaeological Science* 38: 387–398.
- Chase, Arlen F., Diane Z. Chase, and Christine D. White 2001 El Paisaje Urbano Maya: La Integración de los Espacios Construidos y la Estructura Social en Caracol, Belice. In *Reconstruyendo la Ciudad Maya: El Urbanismo en las Sociedades Antiguas*, edited by Andrés Ciudad Ruiz, Maria Josefa Iglesias Ponce de Leon, and Maria Del Carmen Martinez Martinez, pp. 95–122. Sociedad Espanola de Estudios Mayas, Madrid.
- Chase, Arlen F., Diane Z. Chase, Elayne Zorn, and Wendy G. Teeter 2008 Textiles and the Maya Archaeological Record: Gender, Power, and Status in Classic Period Caracol, Belize. *Ancient Mesoamerica* 19(1): 127–142.
- Chase, Diane Z. 1990 The Invisible Maya: Population History and Archaeology at Santa Rita Corozal. In *Prehistoric Population History in the Maya Lowlands*, edited by T. Patrick Culbert and Don S. Rice, pp. 199–213. University of New Mexico Press, Albuquerque.
- Chase, Diane Z. 1998 Albergando a los Muertos en Caracol, Belize. *Los Investigadores de la Cultura Maya* 6(1): 9–25. Universidad Autonoma de Campeche, Campeche.
- Chase, Diane Z. and Arlen F. Chase 1988 *A Postclassic Perspective: Excavations at the Maya Site of Santa Rita Corozal, Belize*. Monograph 4. Pre-Columbian Art Research Institute, San Francisco.
- Chase, Diane Z. and Arlen F. Chase 1994 (editors) *Studies in the Archaeology of Caracol, Belize*. Monograph 7. Pre-Columbian Art Research Institute, San Francisco.
- Chase, Diane Z. and Arlen F. Chase 1998 The Architectural Context of Caches, Burials, and Other Ritual Activities for the Classic Period Maya (as Reflected at Caracol, Belize). In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 299–332. Dumbarton Oaks, Washington, DC.
- Chase, Diane Z. and Arlen F. Chase 2000 Inferences about Abandonment: Maya Household Archaeology and Caracol, Belize. *Mayab* 13: 67–77.

- Chase, Diane Z. and Arlen F. Chase 2003 Texts and Contexts in Classic Maya Warfare: A Brief Consideration of Epigraphy and Archaeology at Caracol, Belize. In *Ancient Mesoamerican Warfare*, edited by M. K. Brown and T. W. Stanton, pp. 171–188. Alta Mira Press, Walnut Creek, CA.
- Chase, Diane Z. and Arlen F. Chase 2004 Archaeological Perspectives on Classic Maya Social Organization from Caracol, Belize. *Ancient Mesoamerica* 15: 111–119.
- Chase, Diane Z. and Arlen F. Chase 2011 Ghosts Amid the Ruins: Analyzing Relationships Between the Living and the Dead among the Ancient Maya at Caracol, Belize. In *Living with the Dead: Mortuary Ritual in Mesoamerica*, edited by James L. Fitzsimmons and Izumi Shimada, pp. 78–101. University of Arizona Press, Tucson.
- Chase, Diane Z. and Arlen F. Chase 2014a Ancient Maya Markets and the Economic Integration of Caracol, Belize. *Ancient Mesoamerica* 25(1): 239–250.
- Chase, Diane Z. and Arlen F. Chase 2014b Path Dependency in the Rise and Denouement of a Classic Maya City: The Case of Caracol, Belize. In *The Resilience and Vulnerability of Ancient Landscapes: Transforming Maya Archaeology through IHOPE*, edited by Arlen F. Chase and Vernon Scarborough, pp. 142–154, American Anthropological Association, Arlington.
- Chase, Diane Z. and Arlen F. Chase 2017 Caracol, Belize and Changing Perceptions of Ancient Maya Society. *Journal of Archaeological Research* 25(2): 185–249.
- Chase, Diane Z. and Arlen F. Chase under review The Materialization of Time in the Maya Archaeological Record: Examples from Caracol and Santa Rita Corozal, Belize. In *Telling Time: Myth, History, and Everyday Life in the Ancient Maya World*, edited by David A. Freidel, Arlen F. Chase, Anne Dowd, and Jerry Murdock. University Press of Florida, Gainesville.
- Chase, Diane Z., Arlen F. Chase, and William A. Haviland 1990 The Classic Maya City: Reconsidering “The Mesoamerican Urban Tradition.” *American Anthropologist* 92: 499–506.
- Coultas, C. Lynn, Mary Collins, and Arlen F. Chase 1994 Some Soils Common to Caracol, Belize and Their Significance to Ancient Agriculture and Land Use. In *Studies in the Archaeology of Caracol, Belize*, edited by Diane Z. Chase and Arlen F. Chase, pp. 21–33. Monograph 7. Pre-Columbian Art Research Institute, San Francisco.
- Farriss, Nancy M. 1984 *Maya Society Under Colonial Rule*. Princeton University Press, Princeton.
- Fletcher, Roland 2009 Low-Density, Agrarian-Based Urbanism: A Comparative View. *Insights* 4(2).
- Foias, Antonia E. 2013 *Ancient Maya Political Dynamics*. University Press of Florida, Gainesville.
- Folan, William J., Ellen R. Kintz, Loraine A. Fletcher, and Burma H. Hyde 1982 An Examination of Settlement Patterns at Coba, Quintana Roo, Mexico, and Tikal, Guatemala: A Reply to Arnold and Ford. *American Antiquity* 47: 430–436.
- Folan, William J., Armando Anaya Hernandez, Ellen R. Kintz, Lorraine A. Fletcher, R.G. Heredia, Jacinto M. Hau, and Nicolas C. Canche 2009 Coba, Quintana Roo, Mexico: A Recent Analysis of the Social, Economic, and Political Organization of a Major Urban Center. *Ancient Mesoamerica* 20: 59–70.
- Haviland, William A. 1982 Where the Rich Folks Lived: Deranging Factors in the Statistical Analysis of Tikal Settlement. *American Antiquity* 47: 427–429.
- Healy, Paul F., John D. H. Lambert, J. T. Arnason, and Richard J. Hebda 1983 Caracol, Belize: Evidence of Ancient Maya Agricultural Terraces. *Journal of Field Archaeology* 10: 397–410.
- Helmke, Christophe and Jaime J. Awe 2016a Death Becomes Her: An Analysis of Panel 3, Xunantunich, Belize. *The PARI Journal* 16(4): 1–14.

- Helmke, Christophe and Jaime J. Awe— 2016b Sharper Than a Serpent's Tooth: A Tale of the Snake-head Dynasty as Recounted on Xunanutunich Panel 4. *PARI Journal* 17(2): 1–22.
- Helmke, Christophe, Arlen F. Chase, and Diane Z. Chase 2018 Another Look at Stela 2 of Caracol, Belize. *Mexicon* 41: 97–104.
- Houston, Stephen D. 1987 Appendix II: Notes on Caracol Epigraphy and Its Significance. In *Investigations at the Classic Maya City of Caracol, Belize, 1985–1987*, by Arlen F. Chase and Diane Z. Chase, pp. 85–100. Monograph 3. Pre-Columbian Art Research Institute, San Francisco.
- Hutson, Scott R. 2016 *The Ancient Urban Maya: Neighborhoods, Inequality, and Built Form*. University Press of Florida, Gainesville.
- Hutson, Scott R. (editor) 2017 *Ancient Maya Commerce: Multidisciplinary Research at Chunchucmil*. University Press of Colorado, Boulder.
- Inomata, Takeshi and Stephen D. Houston 2001 Opening the Royal Maya Court. In *Royal Courts of the Ancient Maya: Vol. 1: Theory, Comparison, and Synthesis*, edited by Takeshi Inomata and Stephen D. Houston, pp. 3–23. Westview Press, Boulder.
- Jaeger, Susan 1991 *Settlement Pattern Research at Caracol, Belize: The Social Organization in a Classic Maya Center*. PhD dissertation. Department of Anthropology, Southern Methodist University, Dallas.
- Johnson, Lucas R. Martindale 2014 Lithic Technology and Crafting at the “Gateway Group” from Caracol, Belize: Implications for Maya Household Archaeology. *Research Reports in Belizean Archaeology* 11: 81–94.
- Johnson, Lucas R. Martindale 2016 *Moving, Crafting, and Consuming Stone: An Investigation of Obsidian from Caracol, Belize*. PhD dissertation, Department of Anthropology, University of Florida, Gainesville.
- Johnson, Lucas R. Martindale, Maureen Carpenter, Arlen F. Chase, and Diane Z. Chase 2015 Articulating with the Broader Economy: Chert Pressure Blade Technology in a Caracol Residential Group. *Research Reports in Belizean Archaeology* 12: 77–87.
- King, Eleanor M. (editor) 2015 *The Ancient Maya Marketplace: The Archaeology of Transient Space*. University of Arizona Press, Tucson.
- Martin, Simon and Nikolai Grube 2000 *Chronicle of the Maya Kings and Queens: Deciphering the Dynasties of the Ancient Maya*. Thames and Hudson, London.
- Masson, Marilyn A. and David A. Freidel 2012 An Argument for Classic-Era Maya Market Exchange. *Journal of Anthropological Archaeology* 31: 455–484.
- McAnany, Patricia A. 1993 The Economies of Social Power and Wealth among Eighth Century Maya Households. In *Lowland Maya Civilization in the Eighth Century AD*, edited by Jeremy A. Sabloff and John S. Henderson, pp. 65–90. Dumbarton Oaks, Washington, DC.
- McAnany, Patricia A. 2010 *Ancestral Maya Economics in Archaeological Perspective*. Cambridge University Press, Cambridge.
- Murtha, Timothy 2009 *Land and Labor: Maya Terraced Agriculture: An Investigation of the Settlement Economy and Intensive Agricultural Landscape of Caracol, Belize*. DM Verlag Dr. Muller, Saarbrücken.
- Sabloff, Jeremy A. (editor) 2003 *Tikal: Dynasties, Foreigners, and Affairs of State: Advancing Maya Archaeology*. School of Advanced Research Press, Santa Fe.
- Stuart, David 2006 Jade and Chocolate: Bundles of Wealth in Classic Maya Economics and Ritual. In *Sacred Bundles: Ritual Acts of Wrapping and Binding in Mesoamerica*, edited by Julia Guernsey and F. Kent Reilly, pp. 127–144. Boundary End Archaeology Research Center, Barnardsville, NC.
- Thompson, J. Eric S. 1954 *The Rise and Fall of Maya Civilization*. University of Oklahoma Press, Norman.
- Thompson, J. Eric S. 1970 *Maya History and Religion*. University of Oklahoma Press, Norman.

— *Caracol: an anthropogenic landscape* —

- Tozzer, Alfred M. 1941 *Landa's Relacion de las Cosas de Yucatan: A Translation*. Papers of the Peabody Museum of American Archaeology and Ethnology, Vol. 18. Harvard University, Cambridge.
- Webster, David 2001 Spatial Dimensions of Maya Courtly Life: Problems and Issues. In *Royal Courts of the Ancient Maya: Vol. 1: Theory, Comparison, and Synthesis*, edited by Takeshi Inomata and Stephen D. Houston, pp. 130–167. Westview Press, Boulder.

PROOF