10 Minor Centers, Complexity, and Scale in Lowland Maya Settlement Archaeology

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P ROBLEMS exist in dealing with lowland Maya settlement considerations on a regional scale. These difficulties exist at both methodological and theoretical levels. Practical considerations, such as the difficulty of surveying in heavy overgrowth or the expense of large-scale excavation, may lead to partial and potentially problematic samples. Residential groups may be sampled by test pits, but may not be intensively dug. Settlement survey may focus on specific centers, on specific parts of an outlying settlement system, or on long, narrow transects used to position samples within a broader settlement universe. Within this kind of methodology, however, the utility of Maya settlement data is often limited to questions concerning local chronology, artifact distribution, and/or population trajectories. While such data are relevant to considerations of the structure of ancient Maya society, they do not readily lend themselves directly to the creation or discussion of ancient social, economic, or political models.

In spite of the fact that settlement data are well suited to discussions of relationships within and among sites, settlement archaeology is not usually the major source of data for models that explain Maya political organization or regional integration. Instead, settlement archaeology has often been overlooked in favor of models derived from other data sets, such as those based on ethnographic, ethnohistoric, or hieroglyphic interpretation (for amplification, see A.F. Chase and D.Z. Chase 1992, 1998a).A focus, however, on Classic-period political organization, using primarily epigraphic history, easily relegates centers without or with only a few hieroglyphs—even major ones—to lesser status within any site or regional hierarchy.

In addition, single finds can dramatically change the perceived totality of the political landscape viewed through an epigraphic lens. For instance, the discovery of Caracol altar 21, recording a star-war at Tikal in AD 562 (Houston 1987, 1991), dramatically altered our perception of lowland Maya political history and, ultimately, site organization and hierarchy (A.F. Chase 1991; A.F. Chase and D.Z. Chase 1987:58–62; Schele and Freidel 1990). A new reading of a single "agency" glyph resulted in the complete epigraphic re-interpretation of Classic-era Maya political structure and alliances (Martin and Grube 1995). The discovery of a broken eighth cycle monument at Caracol (Grube 1994) changed the perceived importance of political development in northern Guatemala and southern Mexico (compare Pincemin et al. 1998). Incomplete sampling may even lead those sites with hieroglyphs to be prematurely written out of a part of Maya history in which they may have played key roles, as has been the case for Terminal Classic Caracol (see, for example, Mathews 1985:Fig. 14 in comparison to A.F. Chase, Grube, and D.Z. Chase 1991). "Minor centers," which are usually bereft of hieroglyphs, may be completely ignored within epigraphically based and conceptually simple "city-state" or "regal-ritual" models of Maya political organization (Mathews 1991; Webster 1997). Yet, it may be precisely these kinds (and level) of settlement data that allow a regional understanding of ancient Maya political, social, and economic organization, permitting a more accurate and useful definition of Classic Maya polity size and integration.

In its most basic form, *minor center* (Bullard 1960) designates small nodes of architectural concentration. Such nodes are often identified by the presence of vaulted buildings, pyramidal structures, stelae, causeways, and/or ballcourts. The term has been applied, however, to a variety of architectural forms, ranging from distinctive non-residential architecture to elaborate residential groups to clusters of housemounds. The very use of the minor-center concept implies the existence of major centers and establishes a contrastive set that suggests a superordinate and subordi-

nate status within a settlement hierarchy. There are other considerations, however, and the overall settlement context of minor centers is important to understanding their development and function. When no major center is immediately present, such as in the Belize Valley (Garber and Leventhal N.D.), debates can rage over what the designated minor centers represent. They may be portrayed as politically independent units that formed hegemonies of small centers, as segmentary states, or as border areas variously included in larger centralized states. There also may be developmental considerations, for a minor center can become a major center over time. Yet another point is the isolation of minor centers. Because minor centers often exist at some distance from major centers, their architectural plazas may be mapped, but they may not be contextualized within broad, areal, block-mapped settlement matrices. Thus, minor centers sometimes may be given a conceptual independence that they may not always deserve, and large-scale, regional, integrative patterning may be completely missed.

Settlement data from Caracol, Belize, demonstrate that at least some minor centers are not necessarily separate entities but are instead functional, though spatially distinct, parts of major centers. These same data reveal the internal organization of a large Maya city and suggest Caracol's position within an even larger regional hierarchy. Most important from the standpoint of this chapter, the Caracol settlement data lend themselves to social and economic models that cannot be derived from the epigraphic database alone.
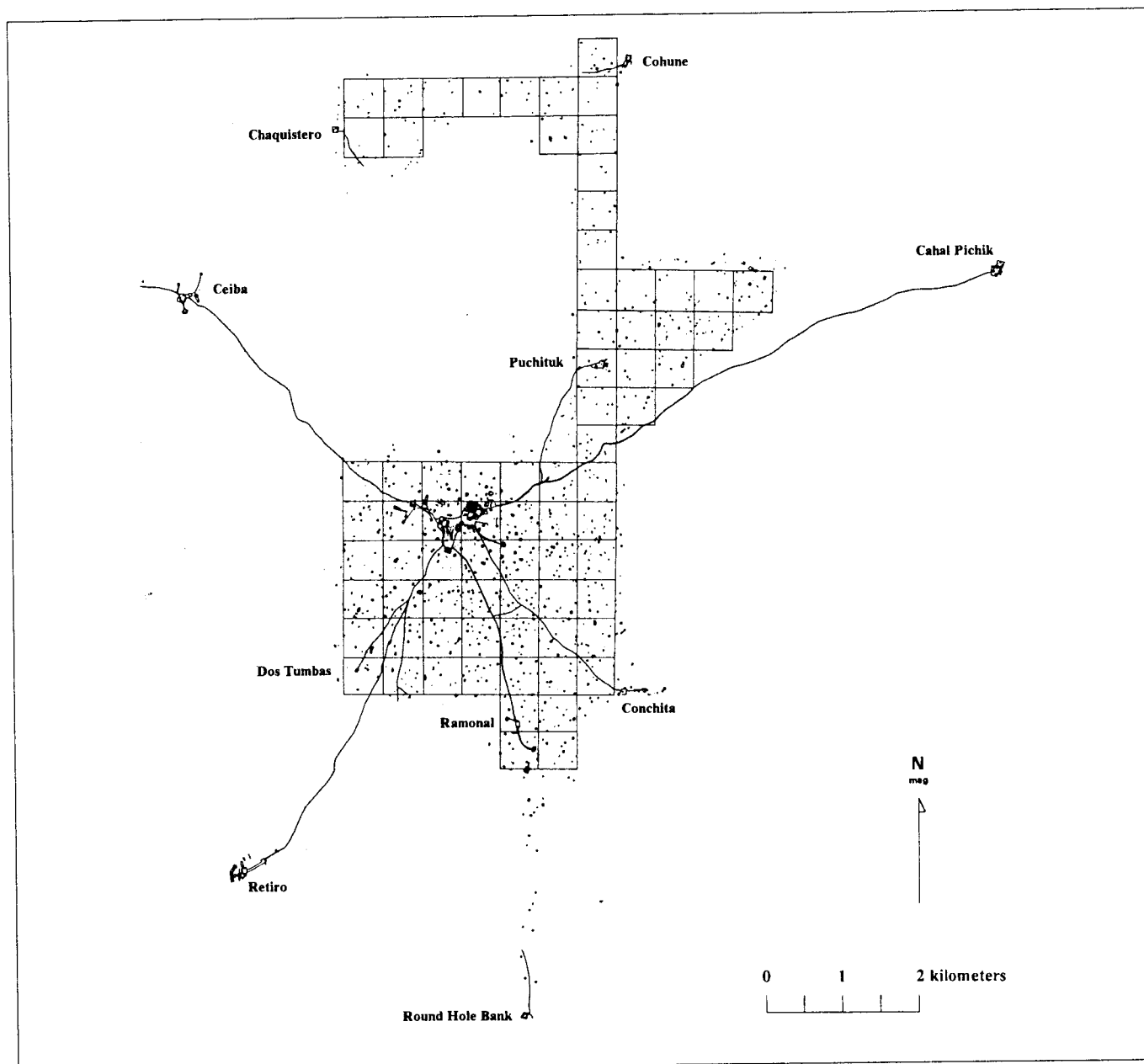
Settlement of Caracol, Belize

Caracol, Belize, was a "primate center," a major regional capital that monopolized its immediate region (what we refer to as the city of Caracol) and occupied the summit of an extensive settlement hierarchy that presumably controlled a spatial area greater than 12,000 km² by AD 650 (A.F. Chase and D.Z. Chase 1996a:808, 1998a:17). In the case of Caracol, its immediate region (about 7 km in radius, representing an estimated 177 km²) appears to have been subsumed into a single metropolitan city during the Late Classic period when the site's population peaked at between 115,000 and 145,000 people (A.F. Chase and D.Z. Chase 1994c:5). For this reason, the University of Central Florida Caracol Archaeological Project, of necessity, has been concerned with defining a large settlement matrix, one that could be used conjunctively with other bodies of data, such as the hieroglyphic history.

At the start of the Caracol project in 1985, Caracol's ruling dynasty had been tentatively outlined and defined by Beetz and Satterthwaite (1981) and A. Stone, Reents, and Coffman (1985). Stephen Houston (1987, 1991) and Nikolai

Grube (1994 N.D.) have since further refined this history. While this epigraphic record served as a starting point for interpreting the political fortunes of Caracol (A.F. Chase 1991, 1992; A.F. Chase and D.Z. Chase 1987:58–62), it has been conjunctively utilized with extensive settlement and archaeological data to gain a much broader understanding of Caracol as a city, a polity, and an ethnic identity (A.F. Chase and D.Z. Chase 1994a, 1994c, 1996a, 1996c, 1998a; D.Z. Chase and A.F. Chase 1998).

Site population and construction history can be compared with monument erection to show increased unity following sixth- and seventh-century warfare and decreased unity following late eighth- and early ninth-century warfare (D.Z. Chase and A.F. Chase 2000). Thus, there are sometimes different archaeological manifestations for somewhat similar historic statements. In addition, the epigraphic record and settlement history sometimes show contrasting curves. For example, excavations show that Caracol was exceedingly large, prosperous, and populated during the later part of the Late Classic era (post AD 650), a time when relatively few known stone monuments were erected within the site core. While the dearth of monuments has been taken by epigraphers to reflect the site's relative unimportance at this time, the archaeological data demonstrate continued prosperity. We believe that Late Classic political organization at Caracol was not based solely on dynastic kingship and, therefore, would not necessarily be reflected in the hieroglyphic record found on stone monuments (A.F. Chase and D.Z. Chase 1996c).

In studying the settlement of Caracol, our concern has been to sample as much as possible of Caracol's settlement area and not just to map a single large square area surrounding the epicenter. As a result of settlement work, the area sampled at Caracol by means of mapped transects and causeways measures 13 km north to south by 14 km east to west. We have also attempted to survey large "blocks" of settlement throughout the core of the site and have to date block-mapped approximately 21 km² of Caracol (figure 10.1), estimated at approximately 12% of its total area. Settlement is continuous and quite dense throughout this area (especially as compared with other Maya centers such as those examined below) but is slightly more concentrated in the area immediately about the site's epicenter (see A.F. Chase and D.Z. Chase 1994c:4–5 for detailed population estimates). The mapping program has also intensively recorded broad areas of agricultural terraces, attempting to present these areas in km² blocks. Three of these km² blocks have been illustrated (A.F. Chase and D.Z. Chase 1996a, 1998b) and help to provide needed information concerning how Caracol's population sustained itself. The expansive spread of residential settlement and agricultural ter-

10.1 Settlement map of Caracol, Belize, current as of March, 1999. Diagonal lines represent causeways; named termini are shown. Each square measures 500 m by 500 m. For ease of comparison, this settlement map of Caracol is at the same scale as that illustrated for Tikal (figure 10.5), Calakmul (figure 10.6), and Coba (figure 10.7)

races was integrated by means of an extensive radial causeway system that connected the site's epicentral groups with strategically placed minor centers, most of which were also termini located at the ends of the causeways (figure 10.1).

Caracol has a large number of rather lengthy causeways (*sacbeob*). Over 30 km of Caracol's roads have been mapped and ground-checked. These causeways and *vias* are readily visible during on-the-ground survey (A.F. Chase and D.Z. Chase 1996b); their widths range from 2.5 to 12 m, and their known lengths range from less than 50 m to approximately 7.6 km. These roads are of two kinds: formal *sacbes* con-

necting the site epicenter with embedded architectural nodes, and less formal *vias* (Hellmuth 1971) connecting residential groups to larger *sacbes*, plazas, or other groups. Twenty-eight different groups at Caracol are associated with *sacbes* or *vias*. One *via* runs approximately 500 m and connects two causeways 1.5 km from the epicenter. In many cases, the less lengthy *vias* are as formally constructed as the longer *sacbes*.

Most Caracol causeways are linked directly to the site epicenter and end in formal architectural groupings arranged around plazas that are on the same order of scale as

those found in the site epicenter. These formal architectural nodes are referred to as termini at Caracol, because they comprise formal causeway endings. Based on the block-mapping undertaken at Caracol, there is generally continuous settlement between the epicenter and architectural concentrations at the ends of causeways; the site's termini are fully embedded within the site's expansive settlement system and are integrated with the site epicenter as a cohesive urban whole. If Hatzcap Ceel, connected to Cahal Pichik by a 12-*m*–wide causeway, can be considered part of Late Classic period Caracol, then the radial causeway distance for the urban system would be on the order of 9.6 km. On this same scale, remote sensing indicates that a causeway links the site of Caballo, some 9.2 km north of the Caracol epicenter, to epicentral Caracol LANDSAT images indicate that even longer roads connect Caracol with other sites to the southeast and northwest (A.F. Chase and D.Z. Chase 1996a: Figure 1).

There are three main kinds of Caracol causeway termini: special-function administrative plazas, engulfed preexisting centers, and residential groups. Eight of Caracol's nonresidential termini and five stand-alone residential termini have been mapped (figure 10.1). Significantly, at least ten of the known Caracol causeway termini would have qualified for the label *minor center* had they not been tied to the site epicenter by causeways and situated within Caracol's continuous settlement matrix. In fact, J.E.S. Thompson (1931) had previously identified Hatzcap Ceel and Cahal Pichik as distinct centers. Yet, by the Late Classic period (if not earlier), Cahal Pichik had been subsumed within urban Caracol, because the one carved monument at Cahal Pichik honors a late Caracol lord (Grube N.D.).

Caracol's termini are spatially distributed in two rings. The first ring of formal nonresidential termini occurs approximately 3 km from the site epicenter. Three of these architectural concentrations are known (for example, Conchita, figure 10.2); all constitute special-function administrative termini consisting of large plaza areas, as large as the epicentral ones, surrounded by low-range buildings that are occasionally elevated. An administrative function has been ascribed to these termini (A.F. Chase 1998; A.F. Chase and D.Z. Chase 1994c, 1996a) because of a lack of residential and ceremonial deposits and debris in these plazas and their associated buildings. Archaeological work indicates that these administrative termini (A.F. Chase 1998; A.F. Chase and D.Z. Chase 1996a) were purposefully located within the Caracol settlement matrix at the beginning of the Late Classic era (circa AD 550).

Large residential complexes, some with palaces, are directly linked to these nonresidential termini by means of their own spur causeways. Isolated residential groups are

attached by causeway directly with the Caracol epicenter. While many of these groups are attached by short causeways no more than 500 m long, in one case a residential terminus is located 2.2 km distant from the epicenter. Again, these residential termini are formal parts of the Caracol epicenter.

Archaeologically, the creation of this road and plaza system, both residential and nonresidential, dates to the early part of the Late Classic era, or after AD 550. This causeway and termini system sometimes bypassed large-scale architecture of an earlier date. The block-mapped Caracol settlement extends out and includes three of the known nearer nonresidential termini (Conchita, Ramonal, and Puchituk), conclusively demonstrating that even though 3 km distant, all these architectural nodes are an integrated part of central Caracol.

The second ring of the Caracol causeway termini consists of preexisting, but engulfed, centers (for example, Retiro, see figure 10.3) and extremely large elite compounds (for example, Round Hole Bank, see figure 10.4) that are linked by causeway to the site epicenter. These termini range in distance from 4.6 to 7.6 (and possibly 9.2 to 9.6) km from the site epicenter. Archaeological data indicate that these Caracol termini were engulfed by the expanding urban center of Caracol during the Late Classic period (AD 550 to 800). In several cases, these engulfed centers (Retiro, Ceiba, and Hatzcap Ceel) witnessed the purposeful addition of a special-function administrative plaza to their architectural landscapes. At Ceiba it was placed adjacent to a larger preexisting plaza and ballcourt; at Retiro (figure 10.3) it was placed northwest and exterior to the preexisting plazas; and at Hatzcap Ceel it was placed west of the major architecture and reservoir.

Settlement transects additionally join two other termini (Cohune and Round Hole Bank) to the formal map; their associated causeways have not yet been completely tied into the Caracol road system through ground-checking. Residential settlement is continuous, however, within the mapped transects. In an effort to examine Caracol's urban boundaries relative to engulfed architectural nodes, as well as to examine internal differences in agricultural fields and practices, a settlement area approximately 5.5 km due north of the Caracol epicenter is currently being block-mapped by Timothy Murtha (Pennsylvania State; see figure 10.1).

We believe that causeways served an important function within Caracol. They did not merely join elite residences to the epicenter. The more numerous special-function plazas, bounded with low-range buildings that served as termini, are thought to have also functioned as embedded Caracol administrative nodes that were fully contextualized within a continuous settlement matrix. The positioning of the dis-
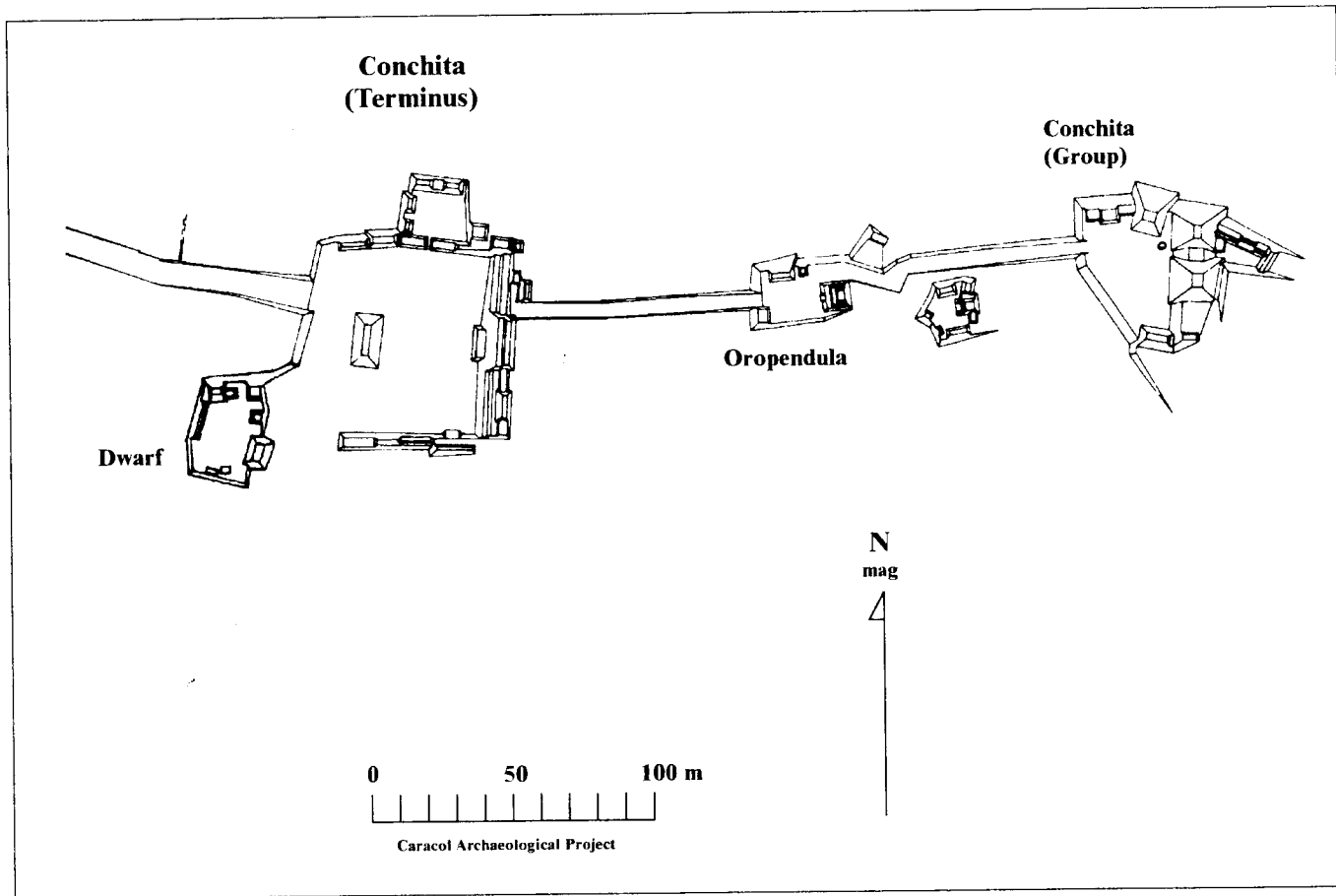
10.2 Detailed map of the Caracol special-function administrative terminus, Conchita. Two elite residential groups are east of the terminus plaza and are linked by causeway to it.

tinctive range-building plazas at the junction of engulfed centers and causeways bolsters the idea of Caracol administrative control. In sum, the causeway system unified the termini, site core, and site epicenter. The Maya of Caracol could make a round-trip from one terminus to another (within the 5 to 10 km radius) within a single day, thus facilitating communication, transportation, and distribution of goods.

Late Classic Caracol has a distinct and relatively uniform identity (A.F. Chase and D.Z. Chase 1996c). Over 60% of Caracol's residential groups are east-structure focused (A.F. Chase and D.Z. Chase 1987, 1996c). Most residential groups contain formal tombs and special ceramic cache vessels decorated with modeled faces (A.F. Chase and D.Z. Chase 1994a). Compared to other sites, a sizable proportion of Caracol's population, over 20%, exhibited inlaid teeth (D.Z. Chase 1994, 1998). Most residential groups at Caracol had access to shell ornamentation and polychrome ceramics (D.Z. Chase 1998). Epicentral Caracol, the Caracol termini, and household groups located several kilometers from the epicenter all participated in the same ritual activities (D.Z.

Chase and A.F. Chase 1998). These activities unified the inhabitants and distinguished them from their neighbors.

While there was unity in ritual activity at Caracol, there was diversity in the production of items, at least on a household level (for example, A.F. Chase and D.Z. Chase 1994c; Pope 1994). Individual households at Caracol appear to have been the major units of production for a wide variety of items made from lithics, shell, and perishable materials (probably wood).The distribution of goods was facilitated and administered, however, through the causeways and termini. The overall pattern of the Caracol causeway termini fits a central place, K-7 model of an administered landscape, believed to be reflective of monopolistic control of a market system (C.A. Smith 1974, 1976; see also Santley 1994). Elsewhere, we (A.F. Chase 1998) have more clearly presented the argument that the Caracol special-function plazas served as market locales in a centrally controlled administrative economy. Briefly stated, C. A. Smith (1976:334) argued that in situations of high population density, large urban-size markets must develop to efficiently distribute needed items. Caracol exhibits both the required size and density; within
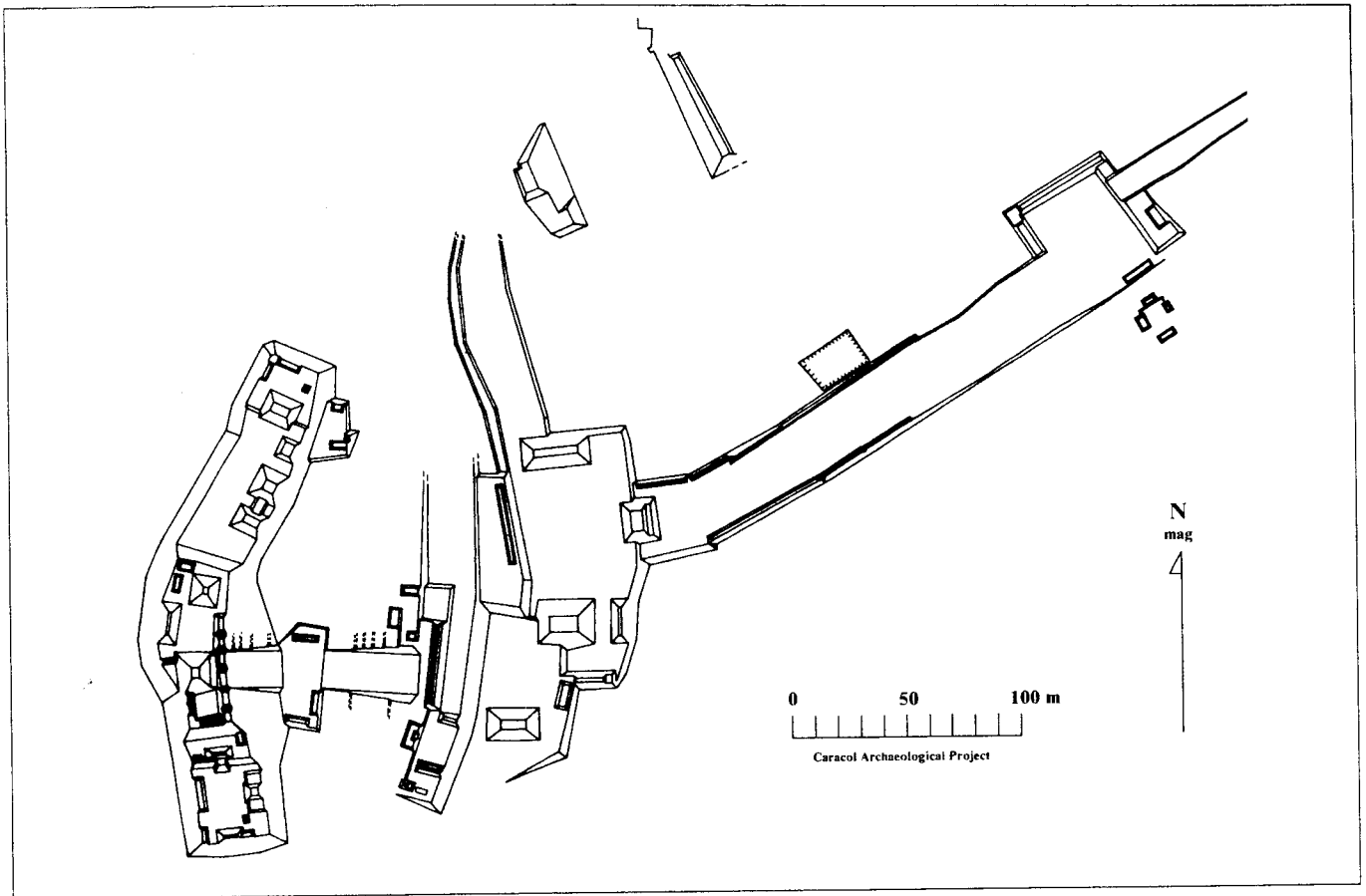
10.3 Detail map of the engulfed Retiro terminus showing the siting of a special-function plaza before entry to the preexisting site and its settlement

its urban landscape the only nodes that could have functioned as control points or markets are the special-function plazas that are regularly embedded within the site's settlement matrix and are all directly linked to the site epicenter.

In summary, block mapping and intensive survey at Caracol have demonstrated that several minor centers, some of which were initially presumed to be discrete sites and all of which are located some 3 to 10 km distant from the epicenter, were fully embedded in a large, expansive, and integrated settlement matrix by the middle of the Late Classic period. The minor centers or termini are identifiable, but integral, parts of Caracol's urban core. The causeways, termini, and distinctive ritual activities at Caracol both exemplify Marcus' (1983a) comments on the way in which the ancient Maya combined contemporary concepts of urban and rural and contradict implications of dichotomy between center and sustaining area (see also A.F. Chase and D.Z. Chase 1998b). It is suspected that Caracol integrated other, even more distant, centers, such as La Rejolla, Ucanal, and Naranjo (all in Guatemala), into even larger and more complex settlement and political matrices during the Late Classic period.

Settlement at Other Sites: Tikal, Calakmul, and Coba

Were such large integrated systems, like the one at Caracol, at work elsewhere in the lowland Maya area? We believe so. They may not be as easily identifiable as the one at Caracol because of the lack of clear-cut field systems and causeways, but we are certain that many minor centers located in proximity to major centers were actually functional parts of those major centers rather than separate hierarchical units. While settlement archaeology has been a focus of a number of large-scale archaeological projects (for example: Dzibilchaltun, see Kurjack 1974; Quirigua, see Ashmore 1981b, and Schortman 1984; and Seibal, see Tourtellot 1988b), the current comparative discussion is limited to three lowland sites with a scale most comparable to Caracol: Tikal, Calakmul, and Coba.

TIKAL

Tikal, Guatemala, is traditionally cited as one of the largest and most important Mesoamerican cities (W.R. Coe and Haviland 1982). It is spread over 120 km², with an estimated
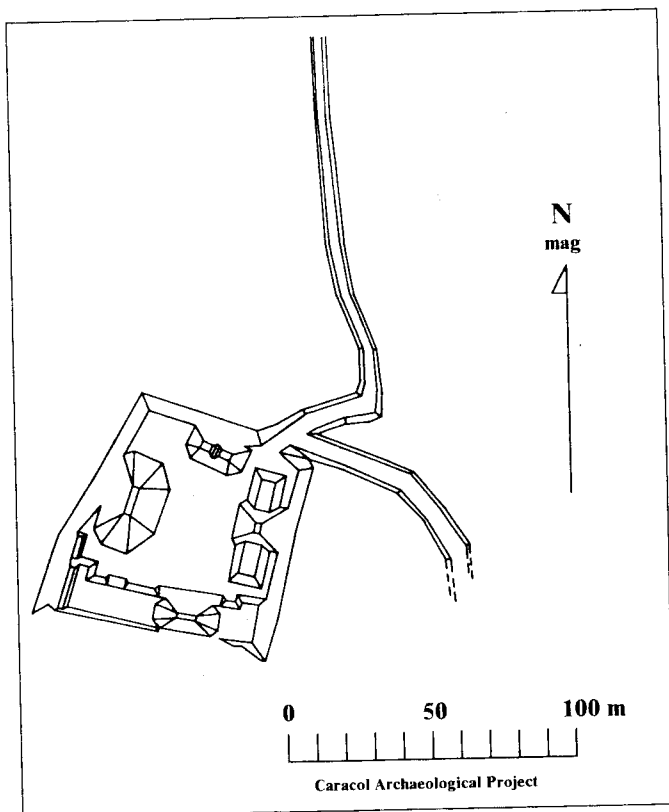
10.4 Detail map of the Round Hole Bank terminus, an elite compound

urban population of approximately 62,000 people; accounting for a rural population 10 to 12 km distant from the site epicenter raises this total to between 92,000 and 120,000 persons. More than 425,000 people are believed to have occupied Tikal's "realm," which has been estimated at 1963 km² (Culbert et al. 1990:117), a spatial figure we believe is too small for such a significant political unit (A.F. Chase and D.Z. Chase 1998a).

Settlement work at Tikal focused first on mapping a square extending out 2 km in each direction from Tikal's central plaza (Carr and Hazard 1961). Following the recording of this central 16 km², four cardinally oriented 500-*m*-wide settlement transects were assayed beyond the central portion of Tikal (figure 10.5). Eventually, the northern transect was extended to Uaxactun, some 19 km distant from Tikal's central plaza (Puleston 1983:24). All these transects were used to establish the limits of the city of Tikal through a demonstration of settlement drop-off. Puleston (1974, 1983:2, 23–24) showed specifically that cultural features and settlement density could be used to identify the limits of the city. On his northern transect, he encountered a wall 4.6 km from Tikal's central plaza. Inside the wall he was able to document 112 structures per km²; outside the wall he found only 39 structures per km².

Tikal presents a very different site and settlement pat-

tern than does Caracol. It has causeways, but they are very broad, ranging from 39 to 60 m in width, and tie together only a small portion of the overall site. The maximum causeway length is only 1 km. Tikal's mapped causeways apparently do not serve the same integrative function as those at Caracol; rather than tying the outlying population and economy together, the Tikal causeways integrate centrally located ritual architecture.

Does this mean that Tikal did not have an integrated marketing system like the one postulated for Caracol? Not necessarily; it means only that formal roads probably did not tie the system together. Where Caracol has two recognizable rings of outlying termini embedded in its settlement, all of which are centrally linked by direct roads, Tikal appears to have a single ring of definable nodes and features at a distance of approximately 4.5 km from its Great Plaza. To the north of Tikal at the 4.5 km distance is an east-west wall and ditch (Puleston and Callender 1967) that marks the urban boundary of Tikal in this direction. Due west and south at 4.5 km distances are the minor centers of Chikin Tikal and Bobal (Puleston 1983: Figs. 14, 16). Both sites exhibit similar plans. They either represent earlier centers that were engulfed within the urban boundaries of Late Classic Tikal or nodes that were purposefully located in the Tikal urban landscape in the Early Classic era (as suggested by excavation data from Chikin Tikal) when Tikal was at its height. The massive Bajo de Santa Fe effectively bounded Tikal on the east. Other minor centers are known from the Tikal urban zone, and at least two of these, Tintal and Mixta Xuc (Puleston 1983: Figs. 13a, 15), both located in the southwestern portion of the site, reflect the form of the Caracol administrative/market nodes with their large plazas and low-range buildings. At least to us, this scenario suggests that further settlement work at Tikal may yet define an embedded economic system similar to Caracol's but without the causeways.

CALAKMUL

Calakmul, Mexico, has come into prominence in the last decade as a result of both extensive archaeological work (Folan et al. 1995) and extrapolated hieroglyphic history (Martin and Grube 1995) that identifies this site as the almost mythological Site Q, a Maya city known primarily from its prominence in hieroglyphic texts at other known sites and in looted nonprovenienced carved monuments (Marcus 1976, but see A.F. Chase and D.Z. Chase 1998a:20–21 and Schuster 1997). Regardless of whether Calakmul may be identified with Site Q, it is a large, major site minimally estimated to have encompassed some 70 km² and to have had a population of 50,000 people; it is believed to have controlled a polity of approximately 8000 km² (Folan et al.
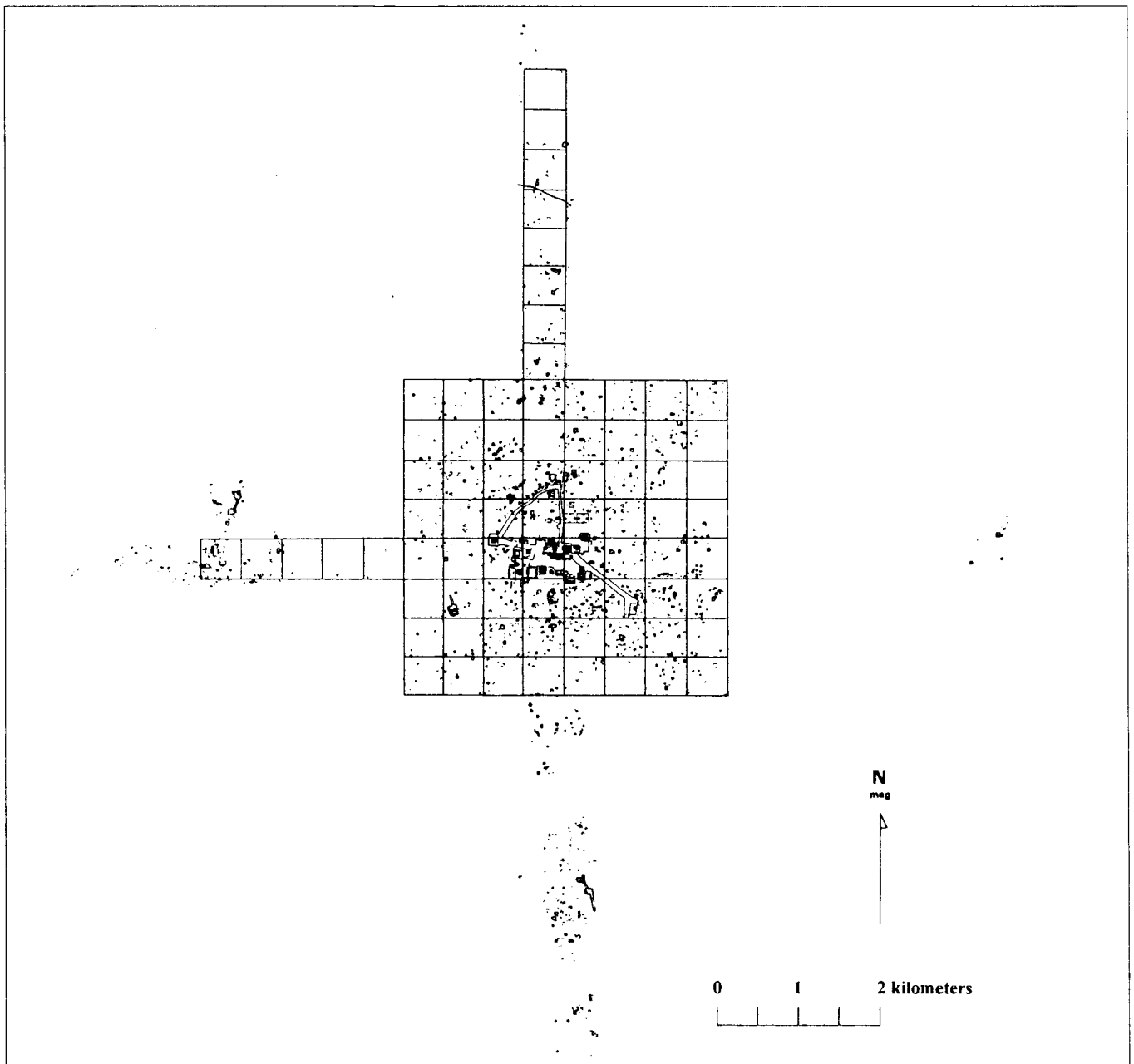
10.5 Settlement map of Tikal, Guatemala. Map combines the settlement and central maps into a single unit.

1995:310). Some 30 km² of Calakmul have been mapped (figure 10.6), with the mapped area extending out 3 km north-south by 2.5 km east-west from that site's epicenter. Yet, despite having mapped a large area, no obvious embedded matrices, such as those known from Tikal and Caracol, have been located. In spite of the large scale of the map, it may be that the Calakmul mapping effort did not extend far enough laterally to have discovered embedded settlement matrices; alternatively, none exist.

Calakmul's settlement differs substantially from that found at Tikal and Caracol. Two small internal causeways measuring 450 x 70 m in length exist within Calakmul's mapped area (Folan et al. 1995:313). Five other causeways have been defined either visually or through remote sensing (Folan, Marcus, and Miller 1995), but none have been ground-checked. Calakmul's causeways do not appear to integrate the site in the way that Caracol's do. Rather, the majority of Calakmul's causeways appear to focus on long-distance linkages with other centers that are 8 to 38.25 km distant (Folan et al. 1995:313). If the long-distance causeways of Calakmul can be verified on the ground, they would appear to conform with the previously known long-distance

0   1   2 kilometers
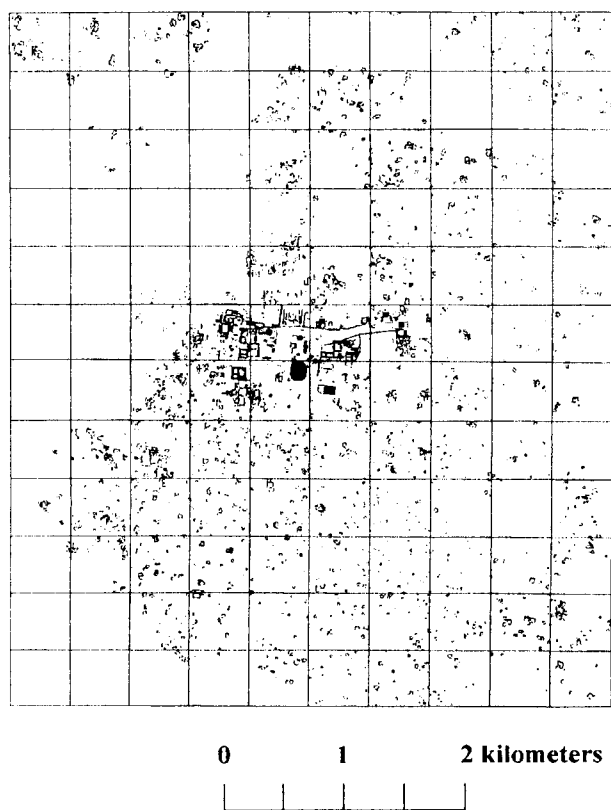
10.6 Settlement map of Calakmul, Mexico. North is to the top of the page. Each square measures 500 x 500 m

system that centers on Mirador (I. Graham 1967), 38.25 km south of Calakmul (and joined to Calakmul by a causeway). Settlement drop-off is also evident within the area mapped at Calakmul, especially to the southwest and northeast (figure 10.6). The southwestern portion of Calakmul is dominated by an area of bajo, but no such claim can be made for the northeastern section of the site.

While Calakmul can be placed into a very broad regional frame because of its externally oriented causeways, the internal organization of the site does not lend itself easily to comment. Calakmul is not tightly organized internally like Caracol, and its urban area is not bounded by walls like Tikal. Because no minor centers have been identified within the urban boundaries of Calakmul, unlike Tikal and Caracol, there is currently no evidence of a similar embedded economic and administrative system.

COBA

Coba, Mexico, dominated the eastern part of the Northern lowlands during the Late Classic period. Its population has been estimated between 42,870 and 62,652 persons within a 63 km² area (Folan et al. 1983:197–202). Based on its causeway linkages, Coba's polity size may have exceeded that of

Caracol, Calakmul, and Tikal. Two of Coba's causeways were long distance and joined distinct centers, specifically Ixil, 24 km away, and Yaxuna, 101 km distant. Like Caracol, however, the vast majority of Coba's causeways linked internal parts of the site (figure 10.7). Like Caracol, Coba's causeways clearly served an internal integrative function (Benavides Castillo 1981).

Extensive settlement work has been undertaken at Coba. Under the auspices of the Carnegie Institution of Washington at the beginning of the twentieth century, Thompson, Pollock, and Charlot (1932) first presented a map of downtown Coba, while Villa Rojas (1934) documented the Yaxuna-Coba causeway. Extensive downtown settlement plans for Coba were first published by Folan, Kintz, and Fletcher (1983). A cruciform settlement survey, mimicking that of Tikal, was carefully documented by Garduno Argueta (1979). Garduno's detailed mapping clearly shows a substantial settlement decrease as one leaves the urban area of Coba, as defined by its causeways and termini.

It is suspected that at least some of the causeways so evident at Coba (Benavides C. 1981; Folan et al. 1983) may be representative of an administered economy similar to that proposed for Caracol. Coba's causeway system is not as centralized as the one found at Caracol, but it does have two rings of embedded nodes, the first 2 to 3 km from the middle of the site and the second 4 to 5 km from downtown Coba (figure 10.7). Folan suggests that the intrasite causeways primarily served as "high-status links between the central core of Coba and its peripheral zones," but he also notes they served political and administrative purposes (1983:55). Based on the Caracol data, it is likely that some causeway termini at Coba may also have served market functions.

Conclusion

The extant settlement data in the Maya area demonstrates the striking variability of scale and emphasis that occurs within the lowland Maya landscape. Some of this variation is indicative of differing degrees of political centralization. Some of the diverse interpretations of settlement data are, however, also related to strikingly different concepts of polity size that are held by different investigators (for a review, see A.F. Chase and D.Z. Chase 1998a). Thus, there may well have been situations within the Maya lowlands where loosely organized polities existed, such as in the Puuc area of the Yucatan peninsula (Dunning et al. 1994) or where centers 3 to 10 km apart were conceivably independent rivals, as has been suggested for the Petexbatun area (Demarest 1997). In these instances, however, conceptualizations of small Maya polity size are often based on interpretations of geographic or other spatial models, such as nearest neighbor
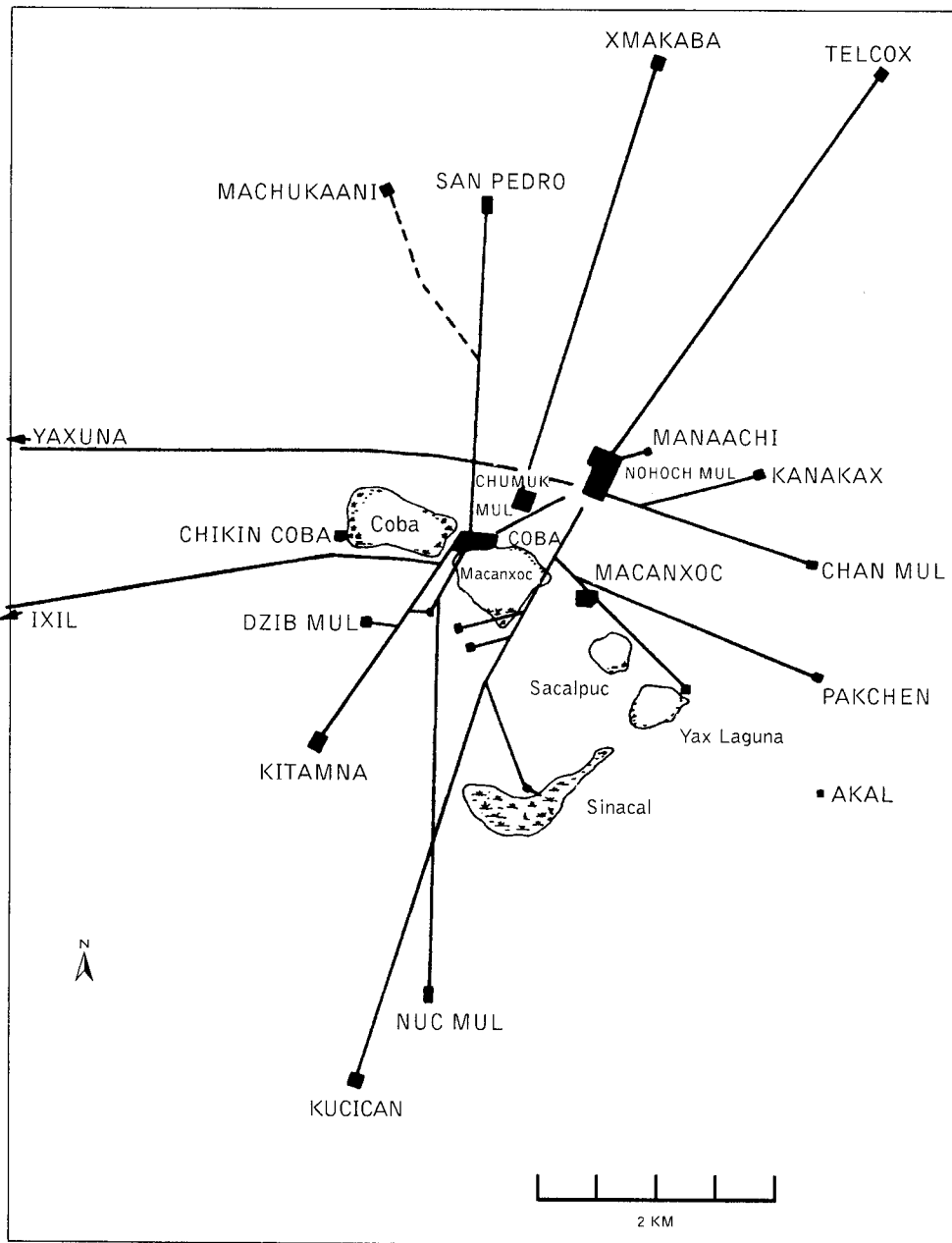
analysis or thiessen polygons, rather than on detailed settlement work. Other, more complex organizations clearly existed in the Classic Maya lowlands, such as at Late Classic Caracol and Late Classic Coba, where all occupation within a 3 to 10 km radius of the site epicenter was incorporated into a single functional city. In these instances, detailed settlement work has led investigators to record the on-the-ground, large-scale integration of single urban centers, and the massive size of such centers is usually considered to reflect the existence of large centralized polities during the Classic period.

Not only is there variation in settlement scale and intensity within the different regions that comprise the Maya lowlands, there is also great variation in the size, composition, and layout of most Maya sites. Even the largest Maya cities are composed differently. They may be inwardly focused and less spatially integrated like Tikal and Calakmul, or outwardly expanded and highly integrated, like Caracol and Coba. Minor centers at Caracol have these characteristics: They were located 3 to 8 km from that site's epicenter; they were connected to the epicenter by an extensive web of causeways; they were embedded within Caracol's urban

matrix and growth; and, importantly, they appear to have served as key nodes in Caracol's administered economy. It has been suggested that a similar situation may have existed at Tikal, but without the radiating causeway system. While all four of these centers have recognizable central areas and are clearly hierarchically scaled above other centers in their respective extended regions and polities, the distinctiveness of this settlement signature does not necessarily hold for the entire Maya region. Until more regional projects record contiguous large-scale settlement matrices (such as exists for Caracol, Tikal, Calakmul, and Coba), however, we will be unable fully to characterize and contextualize Maya settlement.

The interpretation of ancient Maya settlement patterns and their various components will remain a somewhat quixotic practice until problems of scale and focus are resolved. In particular, there is a need for more long-term block-mapping of any given regional settlement matrix in conjunction with the mapping of architectural concentrations and narrow settlement transects. Such block-mapping is extremely labor intensive, often adding only a small slice to an already existing map. But, if one wishes to interpret Maya settlement, contextualize minor centers, and understand ancient social complexity, then "large-scale regional survey employing systematic sampling procedures" (Fowler 1997:207 paraphrasing Marcus 1983a) that go beyond the regional epicenter is the appropriate approach. Otherwise, like Don Quixote, we will continue to tilt with windmills in interpreting ancient Maya sociopolitical and economic organization.