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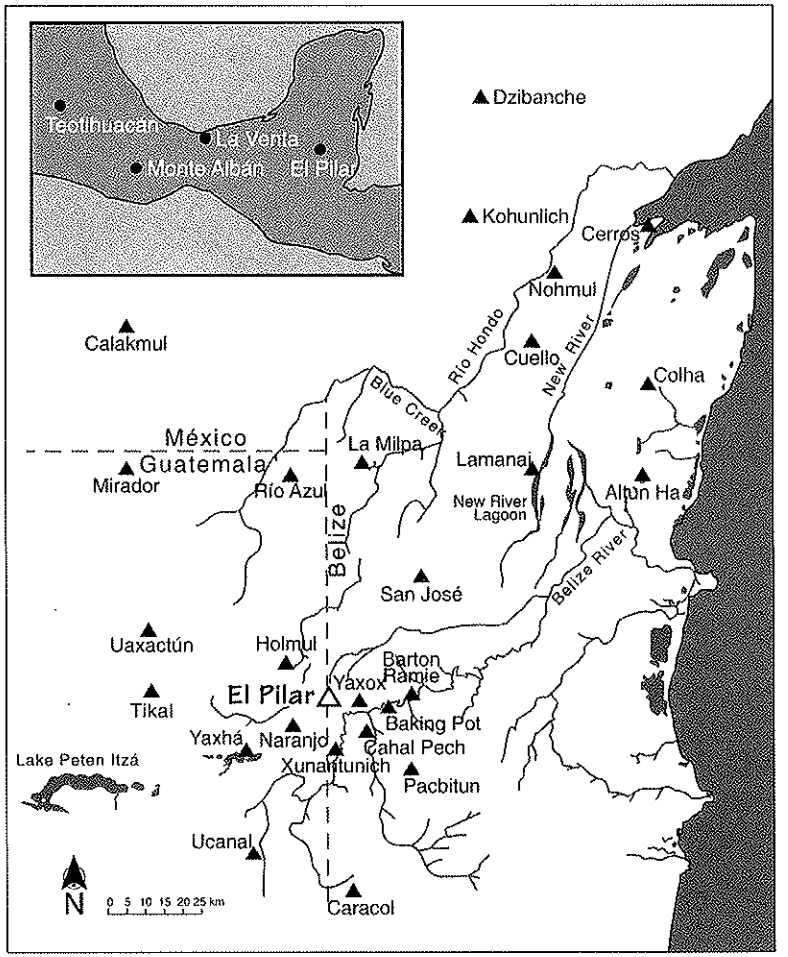
Integration among Communities, Center, and Regions

The Case from El Pilar

Anabel Ford

Complex societies and early civilizations depended on a hierarchical structure to organize and integrate constituent populations and mobilize resources. Archaeologically, this is manifest in the arrangement of individual settlements, variability in local communities, and composition of regional centers. The organization of residential production and consumption provides a foundation for interpreting the nature of settlements, diversity among communities provides insight into the complexity of local centralization, while the functions of and interactions among centers provide clues to regional dynamics. Local organizational centers coordinated communities and component households on the one hand, and managed regional relations on the other. Further, the degree to which power is consolidated and the level at which it is expressed—the community, the center, the region—is directly linked to the basis of support in the hierarchy. For early civilizations, the basis of support was derived from agriculture. Since agriculture is a fundamental component of the economy, it is critical to understand the manner in which the subsistence base was manipulated to support development of hierarchies in early complex civilizations. Archaeological examples of complex societies provide an excellent testing ground for identifying household, community, and regional mechanisms of organization and integration because, ultimately, wealth in these societies must be tied to the production potential of land and control of labor. This chapter examines issues of organization and integration of the ancient Maya in the Belize River area and the significance of the major Maya center of El Pilar within that area (map 3 and fig. 15.1).



Map 3. The central Maya lowlands with Maya centers indicated.

Background

While tropical forests offer distinct environmental conditions that undoubtedly impacted evolutionary events, the organizational solutions achieved by the ancient Maya have obvious parallels with other complex

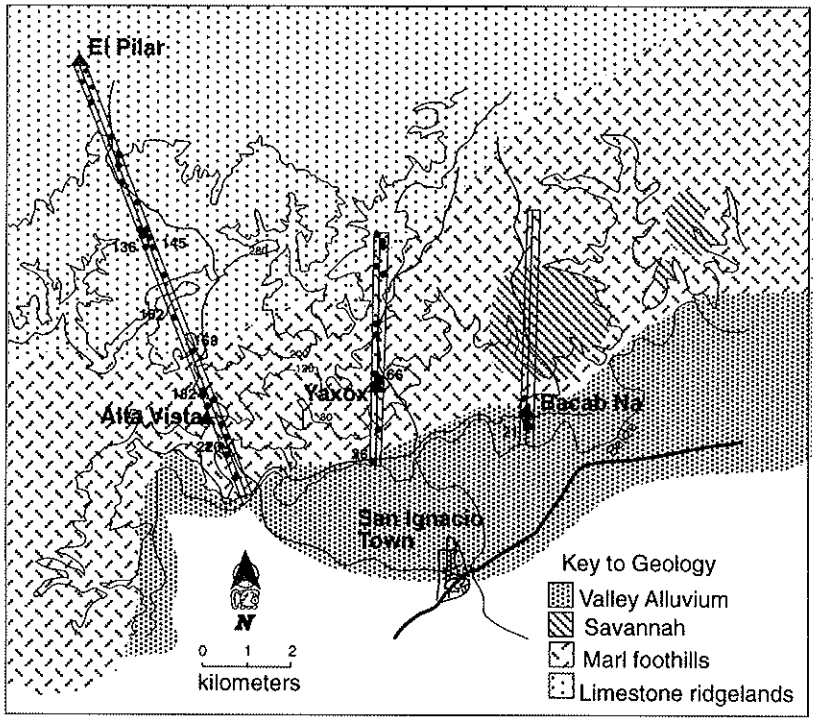


Fig. 15.1. The Belize River Archaeological Settlement Survey area with regional transect surveys, test excavations, and full-scale excavations indicated.

agrarian civilizations. Land resource distribution is an essential factor. The land resources of the Maya lowlands are distributed over the region in a mosaic pattern, rather than in contiguous stretches that concentrate resources and population for direct control. The discontinuous nature of these agricultural resources acted as a dispersive force on settlement and presented unique organizational and managerial problems that frustrate hierarchical controls. Given that the Maya civilization flourished for centuries, it is clear that the elite bureaucracy developed a successful and effective management system. This fact raises the critical problem of how the organizational hierarchy of complex societies facilitated social integration, despite significant variations in resource distribution.

Through the course of the long-term archaeological program of the Belize River Archaeological Settlement Survey (BRASS), we can broadly characterize the chronology of settlement and community patterns in the area (Fedick 1988, 1989; Fedick and Ford 1990; Ford 1990; Ford 1991a, 1991b; Ford and Fedick 1992). The research area naturally divides into three major resource zones based on local geographic characteristics and

agricultural potential. Survey transects traversing these geographic zones from the Belize River north provide that basis of the settlement sample for interpreting patterns of land use of the area (fig. 15.1).

The survey phase (1983–1989) of the research identified settlement distributions and compositions that correlated with the quality of agricultural land resources. Settlement patterns across space and over time and residential unit distinctions in the Late Classic period evince variation by these resource zones: settlement densities are high in the primary agricultural resource zones of the valley and ridgelands and low in the secondary zones of the foothills (Fedick 1989). In addition, a range of residential unit sizes are associated with social and economic distinctions. Larger residential units have more exotics and wealth items and are concentrated in the ridgelands (Ford 1990).

The survey was followed by an intensive excavation phase (1990–1992) in which residential units representative of distinctions in the three major land resource zones were examined. Seven residential units were selected in a two-step process from the data of the survey phase. All tested residential units were grouped by labor investment, a proxy for size, and landform, indicative of production. The data set of residential units were, then, ranked by composition of artifact assemblage (ceramics, stone tools, debitage, obsidian, etc), and the median was selected as the representative of each group.

Differences among the residential units of the resource zones were illuminated through the intensive excavation of these representative sites. This provided insight into the nature of households as well as community production and consumption activities in the area (Hintzman 2000; Lucero 1994, 2001; Olson 1994; Steinberg 1992).

The results of the completed intensive residential unit excavations begin to distinguish the settlement relations among the three major resource zones of the Belize River area: the moderately settled valley, the sparsely settled foothills, and the densely settled ridgelands (fig. 15.1). Settlement concentrations were found in the best agricultural zones of the valley and ridgelands. The poorest zones, the foothills, were characterized by scattered low settlement density. The relative homogeneity of residential units in the valley and foothills allows for a characterization of residential production and consumption. Excavations at residential units in the third and most important resource zone, the ridgelands, however, reveal far more diversity than that encountered in the other two zones. The data of the excavations from the ridgelands suggest that there is considerably more variation in size, composition, construction techniques, and arti-

fact assemblages among the ridgeland residential units than other zones.

The importance of the ridgelands in the Belize River area is demonstrated by a long settlement prehistory, high settlement densities, concentration of large elite residences, and the prominent presence of the major civic-ceremonial center of El Pilar. El Pilar is a major center of the Maya area, with 50 hectares of monuments in the core area (fig. 15.2). The core area is connected by a unique causeway system that crosses the modern political boundary of Belize and Guatemala. The construction sequence of the monuments is only now emerging from excavations of target sectors. The earliest construction phases date to the Middle Preclassic, around 700 B.C. and suggest a significant investment in public architecture at this time. Building and remodeling continues unabated through the Classic period and major works were still undertaken in the Terminal Classic period from A.D. 900–1000. The core monumental area is surrounded by a dense and complex settlement of more than 200 structures per square kilometer.

These outstanding qualities of ridgeland communities distinguish them from communities in other zones and relate the importance of this zone to

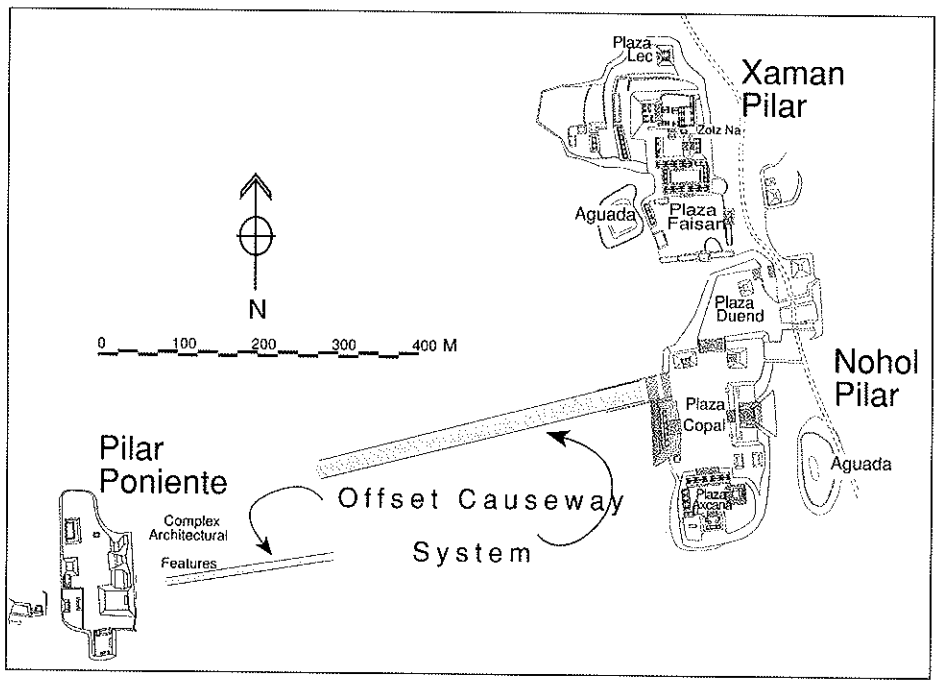


Fig. 15.2. Map of the greater extent of the major regional center of El Pilar (Belize)/ Pilar Poniente (Guatemala).

the subsistence economy in the region. Here, I provide a review of the BRASS project's database as it addresses issues of household activities, community organization, and local centralization, particularly in the Late Classic period of the Maya lowlands. The results provide vital information on household variation and community patterns in the Belize River area as well as insight into the integration of the area from the El Pilar ridgelands with implications for understanding patterning in the region as a whole.

Resources and Settlement of the Ancient Maya in the Belize River Area

The ancient Maya were an agricultural society and their viability depended largely on the success of their farming populace. Broadly speaking, there are four basic land resources that together create the continuum of variation in the central Maya lowlands (Fedick 1994, 1995; Fedick and Ford 1990) and form the composite resource mosaic that both the ancient and contemporary populations of the region could utilize:

(1) well-drained uplands—primary agricultural resources;

(2) slow-drained lowlands—secondary agricultural resources;

(3) riverine-associated swamps—secondary agricultural resources;

(4) closed depression swamps—nonagricultural resources.

It is the relative proportions of these four basic lowland resources that contribute to the subsistence potential of local areas, and it is the distribution of the primary agricultural resources that was the foundation of the ancient Maya regional economic landscape. The mosaic of this overall landscape is reflected in settlement patterns and residential unit activities of the Maya. Densely settled areas were the most intensely utilized and the lightly settled areas were the most extensively used. This is also reflected in the residential constructions.

Field research on local resources, settlement, and residential patterns in the Belize River area has been aimed at addressing organization and integration in the Maya area. Settlement survey data have aided in identifying patterns that were associated with the major resource zones—the valley, foothills, and ridgelands (Fedick 1989). Test excavations were conducted at a 12.5 percent sample of residential units (N = 48) in the survey transects (fig. 15.1). Intensive excavations focused at 9 residential units representing median small, medium, and large units within each major resource

zone (see fig. 15.1). In addition, the residential unit identified with the highest obsidian density in the test excavations was the subject of intensive activity area excavations. We now have a general impression of the overall landscape.

The Community of the Valley

The valley is characterized by a uniform but small proportion of primary agricultural resources (6 percent) restricted along the river, an average settlement density of 98 structures/km^2, a high proportion of single-structure, medium-sized residential units and few large residential units (Ford and Fedick 1992). Intensive excavations included a medium and a small residential unit in the valley zone, revealing general similarities in terms of construction techniques and artifact assemblages (Ford 1991a). Houses had a long occupation history from the Middle Preclassic to the Terminal Classic. They were modest in size, consistent with the survey assessment, and were built in unpretentious proportions—neither small and insignificant nor large and imposing—covering about 200 m^2. Successive constructions and remodelings over time used earth and clay fill, faced and natural stone foundation walls, and plaster floors. The constructions were always enlargements, but the efforts were well within the range of a household enterprise.

Household assemblages of the Late Classic period valley sites are robust, typically including the full range of requisite household goods and a presence of luxury items. Residential units were continually occupied, and a premium was placed on the land between them. The overall impression of valley residential units and the valley community is one of homogeneity made up of a relatively affluent permanent farming populace with little ability to invest beyond their immediate household level.

The Community of the Foothills

The foothills are characterized by a high proportion of secondary agricultural resources (61 percent, fig. 15.1) situated along the flanks of the ridges above the valley, with average settlement densities ranging from 3 to 46 structures/km^2, a predominance of small single-structure residential units, and minimal elite presence. Intensive excavations took place at a medium and a small residential unit of the zone. Constructions were no earlier than the Late Preclassic and abandoned before the Terminal Classic period. While these residential units were similar to each other in construction techniques and activities represented, they were in sharp contrast to the

units of the valley. Construction consisted solely of rubble fill foundations with brief construction sequences composed of carefully sorted and packed fist-sized cobbles that filled in the uneven marl-bedrock surfaces and formed the foundations of perishable superstructures covering ca. 25 to 140 m^2. There was little or no evidence of formal floors and walls. These are ephemeral residential units accessing the more extensive secondary farmlands of this zone where the nearest neighbor may not be closer than 2 km.

Artifact assemblages were skewed at foothill residential units. The production of lithics (chert) was high and included a relatively significant proportion of production byproducts (Ford and Olson 1989; Michaels 1993). There is also evidence to suggest some level of ceramic production (Lucero 1994). Household items, such as grinding stones, were underrepresented. The overall impression of foothill residential units as well as the foothill community is one of a relatively marginalized mobile populace, utilizing the more extensive secondary agricultural resources of the area. The widely spread residences of this zone are similar in that they show evidence of sporadic and intermittent use, little remodeling, and few basic domestic artifacts. In addition to agricultural pursuits, the evidence suggests that residences of the foothill zone were independently investing in the production of household goods to supplement basic subsistence activities (Ford and Olson 1989).

The Community of the Ridgelands

The ridgelands are characterized by the highest proportion of primary agricultural resources occurring in small and large patches comprising some 74 percent of the western ridgelands that make up 34 percent of the Belize River area. The average settlement density in the ridgelands range from 46 to 208 structures/km^2; many are multistructure units. Furthermore, the ridgelands have the greatest number of elite residences and the presence of the most imposing of monumental public architecture. Intensive excavations were undertaken at large, medium, and small example residential units, as well as a large residential unit with high obsidian density.

Unlike the residential units of the valley and foothills, where a general similarity was encountered in the community, the ridgeland units are composed of a diverse and variable group in terms of length of occupation, construction techniques, and activities represented. Residential unit constructions ranged from small single-structure rubble foundations to major platforms supporting corbelled-arch rooms. Rubble construction characterized the small single-structure residential unit that resembled the foothill units in form and composition, with extremely brief construction se-

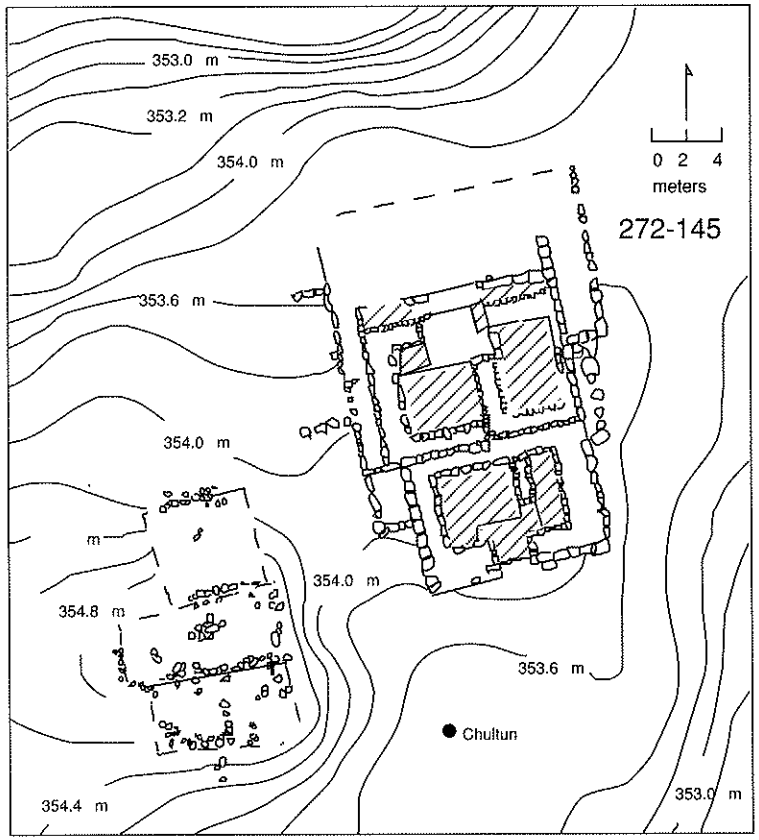


Fig. 15.3. A large ridgeland residential unit excavated in 1992 by the BRASS project.

quences, without formal floors, little use of foundation walls, no clear evidence of remodelings, and an area less than 12 m². Formal faced stone walls, substantial foundation platforms, and finely prepared plaster floors characterize the multistructure medium and large residential units that covered 400 to 1600 m² in area (fig. 15.3). No general pattern in construction techniques could be determined from the excavation sample. Rather a wide range was employed, depending upon the situation.

Artifact assemblages were equally variable in the ridgelands. The small residential unit had few associated artifacts and range was very limited. Ceramics suggest a combination of uses in the area, but the architectural components were largely Late Classic in date. The medium residential unit, occupied through the Classic period consists of finely cut limestone block walls and well-plastered rooms with a complex floor plan. Despite

this clear effort in construction, artifacts densities were low and general household inventories absent. The large residential unit, built from the Late Preclassic through the Terminal Classic period, had both residential and public architecture. This residential unit had considerable quantities of all major artifact types, including a wide variety of luxury items rarely encountered in other zones (Ford 1991a). While it is clear that the nature of the artifact assemblages from each residential area relates directly to local activities, no standard assemblage composition emerges from these ridgeland excavations. Rather, the overall impression is one of considerable complexity. This is hardly surprising as the ridgelands represent the concentration of occupation in the area.

An additional ridgeland residential unit, located in the densely settled ridgeland community we named Laton near the excavations of the example large residential unit, was investigated because of the high densities of obsidian encountered in the testing phase. This large three-structure residential unit covered ca. 1,050 m² in area. Intensive excavations at the obsidian residential unit concentrated on the defined open areas of the plaza, terrace, and platform spaces to identify the nature and scope of obsidian production activities (Olson 1994). Tremendous quantities of obsidian blade production byproducts were recovered in all excavated areas. In one small terrace deposit of blade debitage (Area A), we recovered over 13,000 pieces of obsidian: a density of 1.7 million obsidian pieces/m³ (Hintzman 2000). The material of this deposit represents rejected blade production of obsidian from highland sources (Olson 1994). Another deposit behind a structure (Area B) contained 33 complete, but exhausted, prismatic blade cores. Both these unusual deposits suggest provisional discard areas stashed for future use. Further, in the general open areas of the residential unit there are no areas with less than 3,000 obsidian pieces/m³. The technologies used to reduce the obsidian cores and the conservation strategies employed to extract more obsidian blades through careful rejuvenation methods (Hintzman 2000) further substantiates the value of the raw material of obsidian.

While obsidian production is present in other areas of the Maya region (Clark 1988, 1989; Mallory 1984), this obsidian production assemblage is entirely unique. No such collections have been reported for any other lowland Maya site, including Tikal (Moholy-Nagy, personal communication 1993). The excavations clearly defined the surprising scope and magnitude of the obsidian production enterprises at this large residential unit. Despite extensive excavations throughout the monumental centers of the Maya lowlands and the importance placed on obsidian, this is the first identified

production site of any magnitude in the Maya region. The only contexts with densities of obsidian debitage equivalent to the residential unit at Laton across the Maya area are only known at centers: building dedications, substela caches, and tombs.

The evidence of obsidian production at this elite residence in a peripheral community of the Belize River area underscores the complexities of obsidian procurement, production, and distribution in the Maya area. While it is clear that obsidian was procured by this elite residential unit for production and distribution, it is equally clear that it was not directly controlled by major centers, such as El Pilar or Tikal (Olson 1994). In the Belize River area, as with the entire Maya lowland region, obsidian products, that is, prismatic blades, are ubiquitous. They are recovered, albeit in different densities, from the smallest house to the largest center (Rice 1984). This suggests that obsidian production was treated within a different sphere of the society where products were distributed to constituents as a reward, probably for participation in the subsistence economy, validating the local authority. The byproducts were carefully curated, and fit into a prestige scheme in the elite ceremonial realm, reinforcing the hierarchical structure of the political economy (Olson 1994).

Summarizing the ridgeland community is not straightforward. The general picture of ridgeland residential units as well as the ridgeland community at large is one of economic heterogeneity and diversity, especially in comparison to the relative homogeneity of the foothills and valley zones. This is not entirely unexpected as the residential units of the ridgelands comprise 85 percent of the Belize River area's settlement. The data broadly characterize the disparate complexion of the zone. This concentration and diversity in ridgeland settlement represent a contrast between the haves and the have-nots, between administrative and peasant households, between established homes and temporary field houses. Unlike the comparative uniformity of activities encountered at residential units in the valley and foothills, the ridgelands supported diverse occupations that not only focused on intensive subsistence production, but also on multiple service and production specialties coordinated and supported by the elite political economy of the area.

The Ridgelands of the Belize River Area

The key to community organization and the source of local integration in the Belize River area is among the settlements of the ridgelands. Valley residents were afforded increased or preferred access to lands by restrictions on settlement expansion in that zone. How was settlement restricted

in the valley over time and in the Late Classic, in particular, to enable residents there to take advantage of the rich alluvial soils? Foothill residents were involved in several types of independent manufacturing activities besides the extensive subsistence opportunities of the zone, characteristic of marginalized agriculturists. Such specialists would have relied on exchange to meet aspects of daily needs. What were the mechanisms whereby products of foothill specialists circulated to settlements of the other zones? Obsidian production appears to be highly controlled and attached to elite residential units in the ridgelands. How were luxury items, such as obsidian prismatic blades, controlled and distributed as a privilege? The elite hierarchy was the source of land control, the facilitators of local exchange, and the managers and controllers of wealth goods.

Integration of settlement in the Belize River area depended on the elite hierarchy. That hierarchy was centered in the ridgelands at the regional center of El Pilar. The ridgeland escarpment where El Pilar is prominently situated, extends from Guatemala's Petén into Belize, 10 km north of the Belize River Valley. The location of El Pilar in the Belize River area and in the central lowlands indicates its prominent position as a major regional center of power (map 3 and fig. 15.4). El Pilar ranks equally in architectural complexity to regional Maya centers (Adams and Jones 1981); it is the largest center in the Belize River area, more than three times the size of

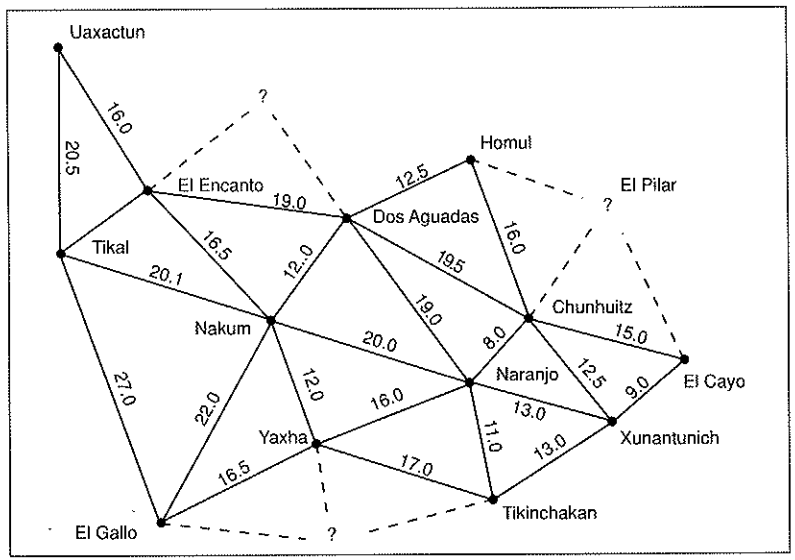


Fig. 15.4. The regional location of El Pilar (after Flannery 1972).

other well-known centers, such as Baking Pot or Xunantunich, and equal to Tikal's nearest neighbors, Yaxha and Uaxactun.

The center of El Pilar was the seat of major local power with clear regional ties with the Maya lowlands. The layout speaks to its complexity (Wernecke 1994). It is divided into at least three primary sectors: Xaman (North) Pilar, Nohol (South) Pilar, and Pilar Poniente (West). The western section has not been thoroughly explored, yet our rapid assessments of 1998 and 2001 indicate that more monuments are in the vicinity. The eastern and western sections are connected by an offset causeway system extending between two large public plaza areas (fig. 15.2). Survey and excavations have been concentrated in the eastern side of El Pilar in Belize. The western section, Pilar Poniente, is across the border in the Republic of Guatemala.

Based on mapping programs at El Pilar that began in 1984, and were expanded in 1986 and then annually since 1993, more than 30 public and private monumental plazas have been identified that cover more than 50 ha of public works. The monuments of El Pilar include many large temples and platforms reaching 17 to 21 m in height, range-structures characterized by well-preserved standing room vaults, two ballcourts, a major acropolis with a labyrinth of palaces, and a system of causeways accessing the main open public plaza, Plaza Copal. This is the plaza that is linked to Pilar Poniente, another public sector to the west in Guatemala (fig. 15.2). The architectural preservation of the center is remarkable, despite the looters' trenches that have penetrated the upper portions of some of the major structures.

In 1993, a detailed study of the center of El Pilar began, establishing the foundation for a long-term program of interdisciplinary eco-archaeological research (Ford 1998). The archaeological plan is segmented into mapping, excavation, and structure consolidation and sequenced so that each aspect informs the next, with long-term conservation clearly in mind. Major work to date has concentrated on Nohol Pilar and the public area around Plaza Copal, where we have begun the task of understanding the construction history in this sector of the site (Wernecke 1994). From the research, we have developed an understanding of the complexity of the northern acropolis zone. Excavations of the buildings of Plaza Jobo from 1996 to 2001 demonstrate successive remodelings and additions that transformed more isolated constructions into labyrinths of rooms over the course of the Classic period (Ford et al. 1997). The result was the evolution of more restricted spaces.

We have also taken time to assess structure orientation, building styles,

and the degree of preservation in the major plazas of the center. Based on small-scale exposures, limited examinations of stairways, and concentrated probe for corners, we have established conservation priorities for El Pilar (www.marc.uscb.edu/elpilar/fieldreports/index_fieldreports.html).

Realizing the contemporary need for development in the riverside villages, the program has been involved in promoting the site as a new adventure tour destination where the community participation is an essential aspect of site development (Ford 1998, www.marc.ucsb.edu/elpilar/10years_achievement/adaptive_management/adaptive_management.html). We have partnered with the community based organization, Amigos de El Pilar, and the Department of Archaeology of Belize in the excavations and consolidations of an example Maya house at El Pilar as well as the renaissance of the forest garden around it. Further, we have opened large areas of the center's monuments, created trails, and assisted in the construction of a caretaker's house that encourages access for local and international visitors.

The map of El Pilar provides a general impression of the center's size, and clues to its complexity (Ford et al. 1995; Wernecke 1994). It is clear that the center required considerable public investment derived from a labor pool representative of the settlements of the general area. The local El Pilar community must have been the immediate support for the center, and the density and diversity of settlement in the proximate area speak to the importance of the center (fig. 15.5). Settlement density within 1 km of El Pilar is extraordinarily high at 292 structures/km^2 (Ford 1990:179). The initiation of the El Pilar Settlement survey supports this assessment.

The four residential units that have been tested in that area, as part of the survey phase, reflect a broad range of sizes, compositions, and assemblage diversities. Full-scale excavations of one large residential unit compound at El Pilar (272–25), where five houses surround a patio, demonstrate the complexity of the permanent residences at the center. Excavations in the 2002 field season in collaboration with K. Kamp and J. Whitaker of Grinnell College, indicated a long occupation for this small site, suggesting a size hierarchy in the Preclassic that was maintained through to the Late Classic.

In addition, there is a major biface reduction locus (LDF chert site) situated adjacent to El Pilar's Plaza Faisan, representing a concentration of chert tool production that must have been coordinated with the functions of the center (Ford and Olson 1989). The data combine to suggest that the community and center of El Pilar figured significantly in the regional economic and political life of the ancient Maya from the Middle Preclassic onward, with major construction initiated no later than 700–600 B.C. and

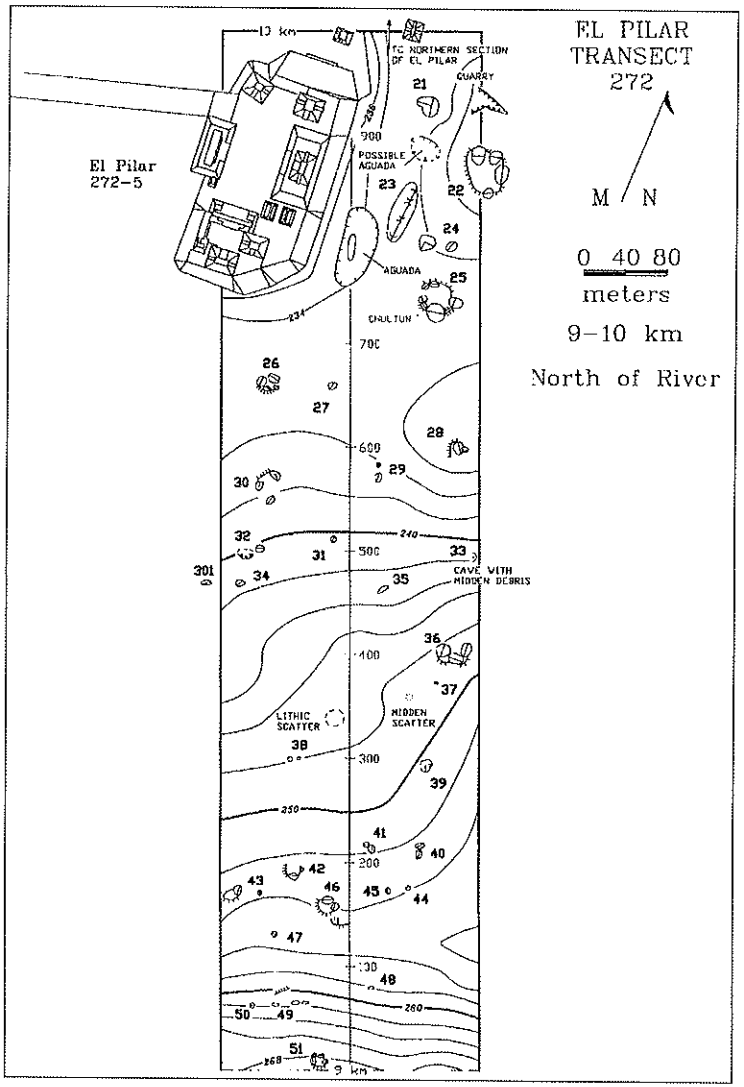


Fig. 15.5. The El Pilar transect just south of the center of El Pilar.

continuing over the course of the next 17 centuries up to A.D. 1000.

Examination of the construction sequences revealed in looters' trench profiles, building excavations of Plaza Copal, and architectural exposures throughout El Pilar has provided an overview of the occupation sequence. Major work has focused on tunnel excavations in the temple Xikna, or EP 7 (Ford et al. 1995: Orrego 1995). The Plaza Copal construction chronology indicates a long, uninterrupted prehistory beginning no later than 500

B.C., in the Middle Preclassic, and continuing through the Terminal Classic period to around A.D. 1000, postdating Tikal's abandonment (Ford and Fedick 1992; Orrego 1995). In addition, many areas of the center have yielded evidence of Terminal Classic construction (Ford and Fedick 1992). Finally, there is indication that the center was used into the Postclassic with the presence of distinctive trade wares that date after A.D. 1000, not only in Plaza Copal but also the northern acropolis area.

The concentrated study of Plaza Copal has revealed a complex sequence of building shifts that help us to understand the evolution of construction and major regional centers in the Maya lowlands. The thrust of the excavations have been at EP 7, or the winged temple Xikna, the easternmost temple in Plaza Copal. The initial excavations also examined other buildings around Plaza Copal.

At least nine major construction episodes have been recognized for the EP 7 temple (Orrego 1995). The earliest constructions date to the Middle Preclassic, and within that period at least three major remodelings were undertaken. The early construction phases are completely unrelated to the later temple of EP 7 (episodes 7, 8, 9). These constructions face the east, buried deep inside the later temple versions. The first two plaza floors are associated with building episodes 8 and 9. In its last Middle Preclassic incarnation, there is a clay platform built of materials from the eastern aguada, or reservoir, representing two public works in one. This is also the first evidence of Plaza Copal to the west of the clay structure.

Later, this Middle Preclassic construction was completely enveloped within the first constructions of the temple. This shifted the activity orientation of the building to face west onto Plaza Copal (related to episodes 5 and 6). All subsequent constructions were designed to increase the size of that temple over a long span of time, from the Late Preclassic to the Terminal Classic periods. Six major temple constructions of Plaza Copal were identified in the EP 7 tunnel excavation. Each of these building episodes related to a plaza floor as revealed in the profile. There is an indication that the last remodeling at the very top of the temple, was arrested before completion, perhaps because of collapse-related problems.

These initial forays into the architectural dimensions of El Pilar clearly illuminate its importance over time both locally and regionally. The size and extent of the monuments along with the long temporal sequence indicate that it drew on a considerable area for its development and maintenance. Early on it must have managed independently, but by the Late Classic period it was certainly part of a major Maya regional hierarchy. The integration within the regional Maya network experienced changes over time, and by the Terminal Classic period El Pilar's local economy was able

to support its local efforts when other areas of the lowlands were disintegrating. Even with the extension of control exhibited at El Pilar, there are signs of problems. The final construction efforts at Xikna temple EP 7 were left incomplete and the important obsidian byproducts curated at Laton were never used.

Interpretation

Recent research has contributed significantly to our general understanding of processes motivating the development of social complexity, providing a foundation for investigations of the managerial basis and support of hierarchical organizations. Management, integration, and power in complex societies are consolidated in the integration of households at the community level, organization of communities at the local level, and interaction among centers at the regional level. For the ancient Maya of the central lowlands, management, integration, and power have been largely reckoned as the basis of local distribution of centers and regional relationships among centers. Recent research has demonstrated that broad regional settlement patterns are directly related to the distribution of primary agricultural resources (Ford 1990, 1991a; cf. Boserup 1965; Cohen 1977), diffusing the hierarchy and acting as a force against the centralization process so fundamental to complex societies. Ultimately, the level of organizational control over primary agricultural resources and agricultural production is the key to the power structure of complex societies (Earle 1991b).

Three important variables contribute support to the hierarchical structure and underwrite power in complex societies: the quality of the subsistence base, the distribution of subsistence resources, and the level of critical resource control. The subsistence base and production potential of a region provide the foundation for growth and development. Resource intensification requires the availability of labor (Webster 1990), and limitations in the availability of land can impact the evolutionary trajectory. While resource potential is fundamental to production, distribution of subsistence resources plays a major role in social integration. Geographic constraints such as swamps or mountains, for example, may act as impediments to effective interaction at the local level and coherent integration at the regional level. Finally, the level of resource control sanctions power in the hierarchical structure, be it at the community, local, or regional level (Friedman and Rowlands 1977; Sanders and Webster 1978:265–295; Webb 1975:180–184; Wright 1984:45). If risk management involved capital investments beyond those of a household or community (Johnson and Earle

1987:16, 209), the costs and benefits may be subsidized by the elite in order to consolidate their power (D'Altroy and Earle 1985:190; Service 1975:8; Webb 1987:164; Webster 1985:34C)). The more critical the resource and the greater the risks to households, the more secure the elite hierarchical power structure.

As with all complex societies, the problems that the ancient Maya had to resolve in maintaining their complex hierarchy involved regional interactions, local integration, and community organization. Regional patterns of settlement differentiation and wealth distinctions are evident in the Maya lowlands (Adams and Jones 1981) with differences related to the organization and control of land and labor (Fedick and Ford 1990). The largest and most elaborate public centers in the region are found in association with high settlement densities (Ashmore 1981; Puleston 1973; Rice 1976), concentration of elite residences, and high proportions of primary subsistence resources (Ford 1990, 1991b). Areas in the region were hierarchically integrated through local centers, which were in turn organized through resident elite within communities (Ford 1986:82–94).

The ancient Maya hierarchy focused on control of the primary subsistence resource of the region: the well-drained ridgelands. Production from the ridgeland zones must have been coordinated by the elite hierarchy at successive levels from the individual communities to integrated centers, and the mobilization of resources formed the basis of local interdependence. Although there was potential for self-sufficiency and assertion of independence at the community level because of the decentralized distribution of the well-drained ridgelands, as well as the other resources and landforms, the effectiveness of successive hierarchical controls had to have depended on the degree to which interdependence was, or at least perceived to be, a requisite. Examination of household variability and community patterns, as presented here, is one way to address these problems. To better understand the relationship between individual communities and the central hierarchy of complex societies, such as the ancient Maya, we need more data on community-level production and consumption activities as well as local-level relationships among communities. In this manner, we will begin to identify the potential links between communities and the central hierarchy.

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