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## 5 **MAYA SUBSISTENCE, SETTLEMENT PATTERNS AND THE INFLUENCE OF OBSIDIAN IN THE POLITICAL ECONOMY AROUND EL PILAR, BELIZE**

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*Hierarchical political structures of complex societies rely on the subsistence sector of society to underwrite their organizational requisites. The degree to which political power is consolidated and the level at which it is expressed is seen to correspond to the scale of the complex hierarchy. Settlement patterns reflect the tiers of a hierarchy and community and center size are essential expressions of the levels of integration. Yet, how is the internal political integration of rural communities balanced against external regional political relations? Examination of the complex hierarchical relationships of the ancient Maya of the central lowlands helps to discern regional to local settlement distribution based on subsistence priorities and local to regional relations based on production and distribution patterns of the exotic, obsidian.*

### **Introduction**

Early civilizations and complex societies depended on hierarchical political structures to organize and integrate their constituent populations and to mobilize productive resources from the subsistence sector. From an archaeological standpoint, this is manifest in the distribution and location of regional centers, the variability of local communities, and the arrangement of individual settlements. At the regional level, the functions of and interactions among major administrative centers provide significant clues to the nature and dynamics of the political economy. The diversity among major centers, however, relates more to the local resource base and level of integration than it does to regional interactions. The complexity of integration at the local level, in turn, is dependent on the extent of community diversity. While the scale of production and consumption at the community level is based on the quantity of immediately available resources, settlement densities and residential compositions will also be tied to the general quality of local resources, which is the basis of their subsistence economy.

The degree to which power is consolidated and the political level at which it is expressed —community, center, or region— directly corresponds to the scale of support within the hierarchy. The size and elaboration of administrative centers give an indication of their population catchment; that is, their ability to integrate rural communities. The degree of internal political integration of local communities typically is balanced against external political relations at the regional level. Communities and their composite households form the foundation of the hierarchy and that aspect is firmly planted in the subsistence sector of the society.

A hierarchy of regional centers, local communities, and individual settlements is generally accepted for complex societies. The Maya are no exception. The expression of this hierarchy is readily identifiable spatially, as seen in the Maya lowlands (see Ashmore 1981). What is more difficult to identify, however, are the links that bind together the distinct levels of the hierarchy. This is the question that will be explored here.

For early civilizations, such as the Maya, the basis of support was derived from agriculture. Because agriculture is a

fundamental component of such economies, it is crucial to emphasize 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 the household, community, and regional mechanisms of social and political organization and integration. This is so because wealth in these societies must ultimately be tied to the productive potential

distribution patterns from the Belize River Area are used to define this tension.

### **Subsistence Economy in the Tropics**

Tropical forests offer distinct environmental conditions that undoubtedly impacted evolutionary events (Meggers 1954). The organizational solutions achieved by the ancient Maya, however, have obvious parallels with other complex civilizations. Political leaders, military strategists, divine priests, and noble kings all need resources to

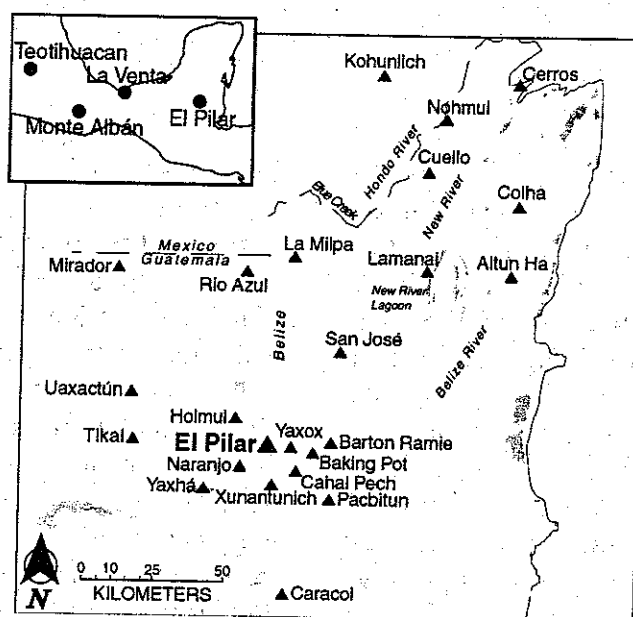


Figure 1. The Central Maya Lowlands with major sites indicated.

of land and control of labor. This paper examines the complex hierarchical relations of the ancient Maya in the central Maya lowlands using data from El Pilar (Figure 1) in an effort to discern how regional patterns and local variations, as determined by the fundamental aspects of resources, were expressions of both the subsistence and political economies. Seemingly at odds, the dispersed resources of the Maya forest environment shape the subsistence economy of the ancient Maya, yet the requirements of centralized organization shape the political economy. Maya obsidian production and

underwrite their exploits. Resource distribution is at the crux of the system. The land resources of the Maya lowlands are distributed over the region in a mosaic pattern (Fedick and Ford 1990; Graham 1987; Sanders 1977; Turner 1978). The discontinuous nature of agricultural resources acted as a dispersive force on settlement, thereby presenting unique organizational and managerial problems which could frustrate hierarchical controls. Given that the Maya civilization flourished and prospered for centuries across a substantial territory (Hammond 1982; Harrison and Henderson

1981; Morley et al. 1983; Turner 1978), it is clear that the elite bureaucracy developed a successful and effective management system for dealing with the diversity. This raises the question of exactly how the organizational hierarchy of complex societies facilitated social integration, given the significant variations in resource distribution.

The ancient Maya hierarchy focused on control of the primary subsistence resource of the region--the well-drained ridgeland dispersed in the hills and ridges of the area. Although there was potential for self-sufficiency and assertion of independence at the community level due to the scattered distribution of the primary resources, 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. To understand communities, and the relationship between communities and the central hierarchy of complex societies, it is necessary to identify relationships among communities at the local level and the potential links between communities and the central hierarchy. This paper initially examines available resources across the central Maya lowlands. This review demonstrates the regional importance of productive agricultural land in the expression of power at centers. Then, on the basis of this understanding of resource distribution, a comparison is made between the central Peten area around Tikal and the Belize River area, 50 km away in the eastern periphery. This aspect brings into focus the underlying similarities of ancient Maya settlement patterns and community organization. Finally, a more in-depth examination of community patterns in the Belize River area hypothesizes the political links between the community and the central hierarchy based on the production and distribution of obsidian. Through these analyses, a dynamic picture of Maya society emerges which takes

into account subsistence base of settlement patterns, the political foundation of community integration, and fragile basis of regional interactions.

### **Regional Resources and Settlement of the Ancient Maya**

The central Maya lowlands are situated over a shelf of Cretaceous to Eocene limestones. Soils form directly over the limestone bedrock today, much as they did in prehistory. This base supports a deciduous hardwood forest whose natural canopy ranges from under 10 to over 50 meters. Annual rainfall in the region varies from as little as 1000 mm to as much as 3000 mm, the majority of which occurs from June to January. The drought-like dry season runs from January to June, with little or no rainfall expected in April. Local activities are impacted by this wet/dry sequence.

Broadly speaking, there are four basic land resources that together form the range of variation in the central Maya lowlands (Fedick and Ford 1990; see also Fedick 1996, Ford 1991a) and the resource mosaic that was utilized by both the ancient and modern populations. These are:

1. *Well-Drained Ridgeland: Primary Agricultural Resources*
2. *Slow-Drained Lowlands: Secondary Agricultural Resources*
3. *Riverine-Associated Swamps: Secondary Agricultural Resources*
4. *Closed Depression Swamps: Non-Agricultural Resources*

The relative proportions of these basic lowland resources all contribute to the subsistence potential of local areas. But, the distribution of the primary agricultural resources--the well-drained ridgeland--was the fundamental component of the Maya regional economic landscape. The primary

agricultural resources were the basis of their hierarchy of control.

While the composite mosaic of land resources is important at the local level, the key to regional distinctions in the Maya area is related to the proportion of ridgelands, which are the primary agricultural resources. Ridgelands dominate the rolling limestone hills and ridges of the region (Turner 1978). They are characterized by fertile, but shallow, soils. Yet, these soils are atypical of the majority of tropical soils. Rather than weathered, leached, and low in fertility, these soils are qualitatively excellent. They are, however, only representative of 1% of the world's tropics. These are the same lands that are preferred today by local farmers. It is understandable why the pioneering Maya selected them.

These well-drained ridgelands most preferred by the Maya for farming are, nonetheless, not evenly distributed in the lowland Maya region (Fedick and Ford 1990). They comprise less than one-sixth of the area of Northern Belize, but nearly half of the interior central Peten area around Tikal. The proportion of well-drained ridgelands is associated with variability within the Maya lowlands. There is a distinct relationship between the availability of ridgelands, settlement density, and the regional Maya hierarchy. Northern Belize, with only 15% ridgelands, had settlement densities of 79 str/km sq. in the ridgelands and the large center of Nohmul covered merely 13 Ha (Figure 2).

The Belize River area, with 39% ridgelands, supported an average of 150 str/km sq. in the ridgelands and the major center of El Pilar covers some 50 Ha. By contrast, the interior Peten, with 49% ridgelands, supported settlement densities of 200 str/km sq. and the exceptionally large center of Tikal covered more than 150 Ha. These comparisons demonstrate that regional settlement distribution and density are

## The Economic Landscape

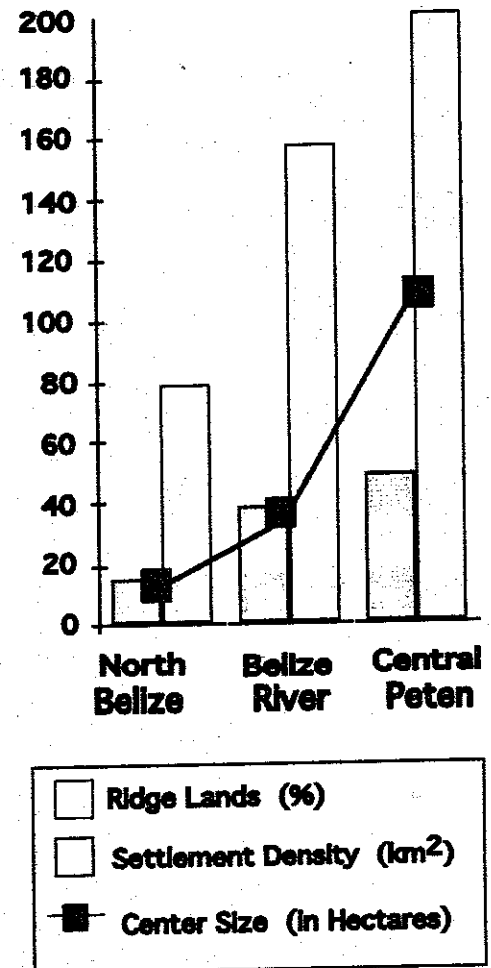


Figure 2. The Economic Landscape of the Central Maya Lowlands.

interconnected with the proportion of available primary agricultural lands. Simultaneously, the scale of monumental public architecture at administrative centers appears to be directly related to settlement densities and corresponding labor potential.

### Local Community Patterns in the Maya Lowlands

Just as regional patterns of settlement in the Maya lowlands were strongly

influenced by the availability of primary agricultural resources, local distributions of settlements were similarly affected by the same base. The important agricultural resources of the Maya lowlands are not concentrated in any contiguous zone and are unlike those in the river valleys of coastal Peru, the Nile of Egypt, and the Indus of South Asia. Instead, they are distributed in patches throughout the region. The dispersed nature of the primary agricultural resources of the well-drained ridgeland acted as a centrifugal force on farming populations. The small and large patches of ridgeland spread Maya farmers out into correspondingly sized communities over the landscape.

Given these factors, how were the dispersed farming communities integrated into the larger centralized system? Settlement data from the region provide some clues to answer this question. For example, in the central Peten area between the centers of Tikal and Yaxha, settlement data mirror the regional pattern at the local level (Figures 3 and 4). These data present a system of dispersed settlements, which were hierarchically arranged in association with the available primary agricultural resources. Variations in the size of residential structures and in the distribution of large, elite residential compounds were related to the

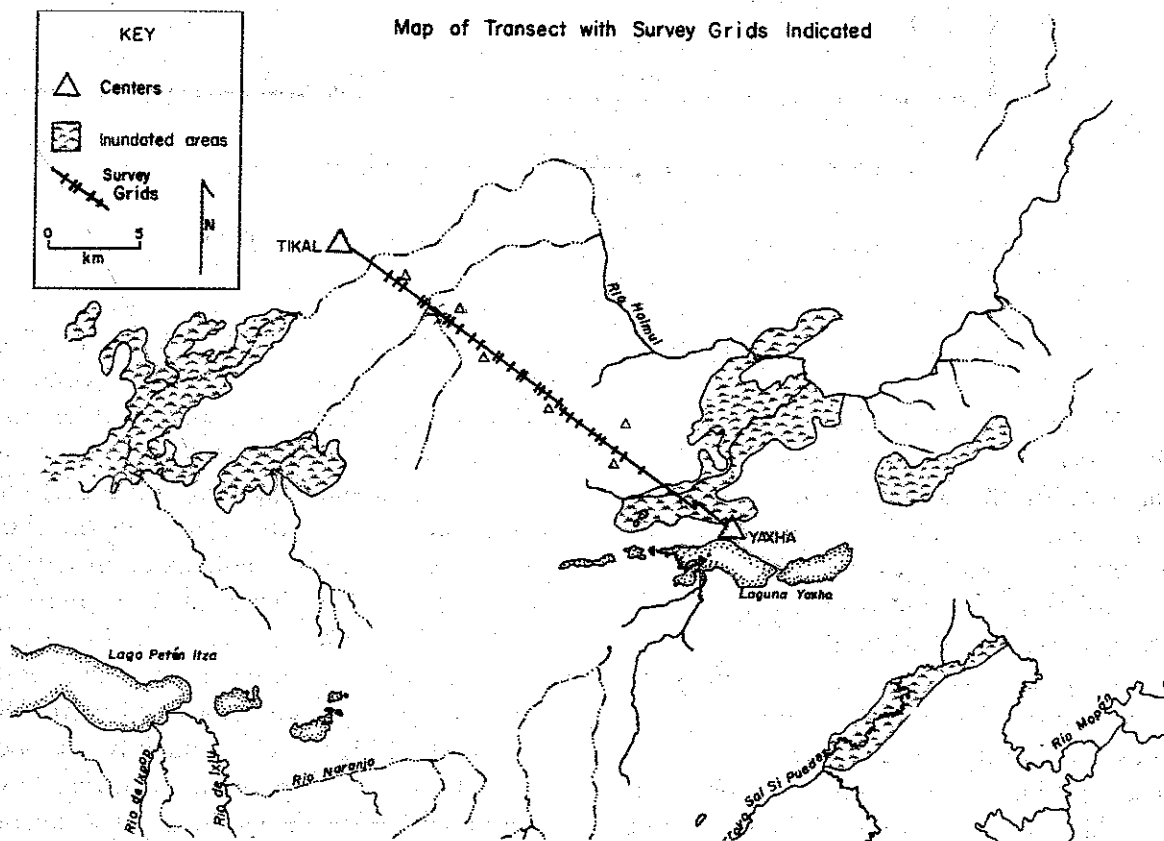


Figure 3. The Tikal-Yaxha Survey in the Central Peten Area.

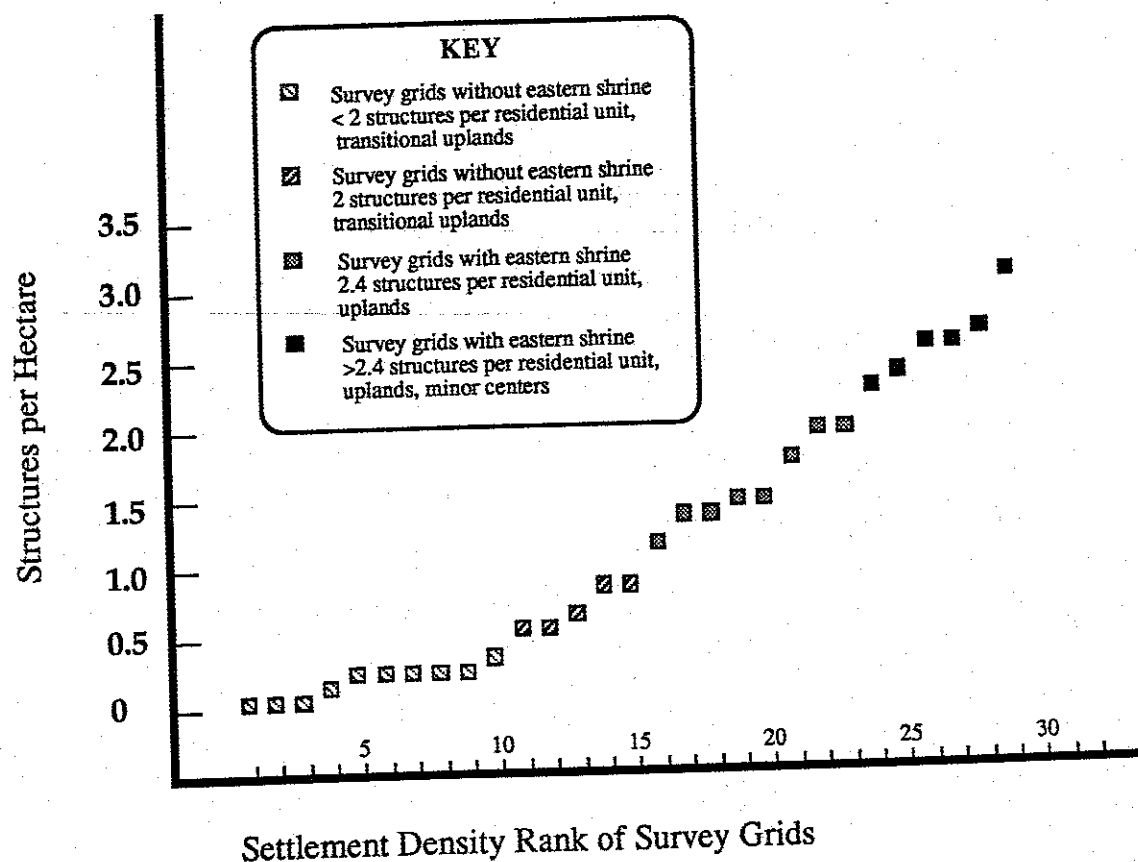


Figure 4. Settlement Density Ranks of Survey Grids in the Tikal-Yaxha area

nature of the resource base (Ford 1986, 1996).

Elite residential units were present in all these primary resources zones, regardless of the size of the area. Small patches of primary resources had settlement densities from 100-200 str/sq. km. None of these small areas were directly connected with centers and the largest elite residential units were half the size of comparable units in areas of centers (Ford 1986:85-87, 1990). Large patches of primary resources were all associated with centers. Settlement densities were relatively high, over 200 str/sq. km, however, the largest elite residential units of these rural administrative centers were only half the size of largest elite residential units at Tikal. Of the largest "patches" of primary

resources in the central Maya lowlands (Ford 1991b), the zone around the major center of Tikal is particularly noteworthy. The zone around Tikal had settlement densities above 200 str/sq. km and supported the largest elite residential units of the entire region (Ford 1986:85-87, see also Arnold and Ford 1980).

The Belize River area (Figure 5), located 50 km east of Tikal, has 80% of the proportion of primary resources found in the central Peten area (see Fedick and Ford 1990, Ford 1990, 1991b). Consequently, the local Belize River area supported somewhat lower overall settlement densities, and had smaller centers in comparison to the central Peten area. As with the central Peten area, zones of primary resources have settlement densities greater than 100 str/sq. km. These primary

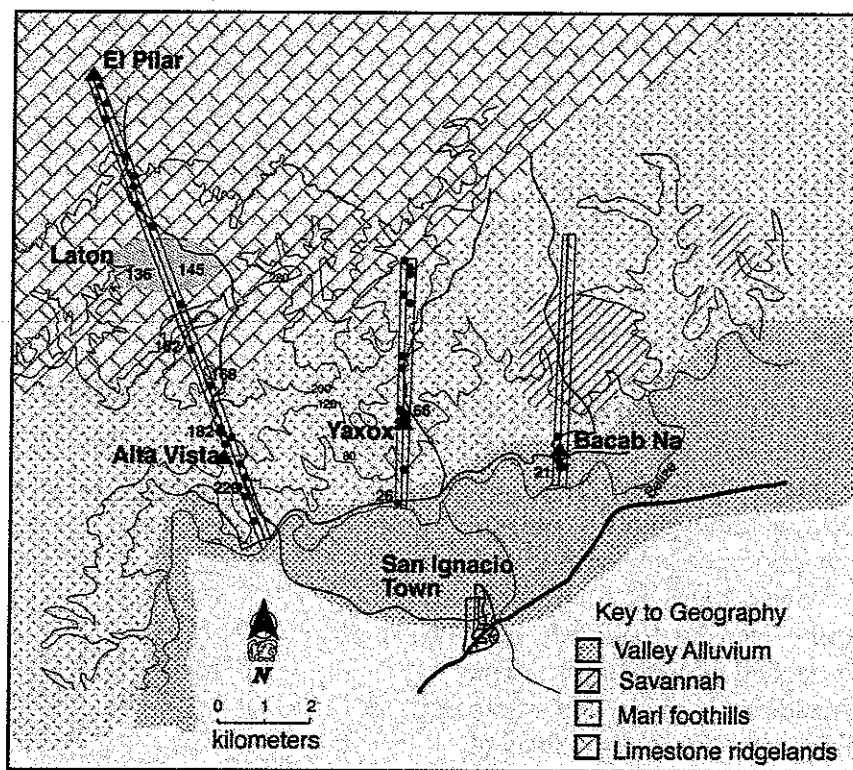


Figure 5. The Belize River Area with BRASS with resource zones Indicated.

resource zones are located in the alluvial valley and western ridgelands, composing 39% of the local area resources. The secondary resource zones, dominating the foothills that rise from the valley to the ridges, composed 61% of the local area with settlement densities under 50 str/sq. Km.

Similar to the settlement of central Peten area, the proportion and distribution pattern of primary resources in the Belize river area played a major role in the dispersion of settlements and communities (Fedick 1988, 1989, 1995, Fedick and Ford 1990, Ford and Fedick 1992). The greatest proportion of primary agricultural resources of the Belize river area are located in the ridgelands. They compose 34% of the resources in local area, of which fully 75% are primary resources for farming. Small and large pockets of the primary resources

supported high settlement densities, equivalent to the central Peten area (c. 200 str/sq. Km), and have elite residences in their midst. As in the central Peten area, the community and settlement hierarchy is consistent with the distribution of agricultural resources. The largest center in the area, El Pilar, is located within a substantial concentration of primary resources. Settlement density and composition compare to centers in the central Peten area, although the largest residential units around El Pilar were only half the size of those around Tikal (Ford 1990). Communities located in small patches of primary resources were found throughout the El Pilar ridgelands. One recorded example was the settlement concentration labelled the community of Laton, 4.5 km south of El Pilar (Figure 6). This ancient Maya community included the

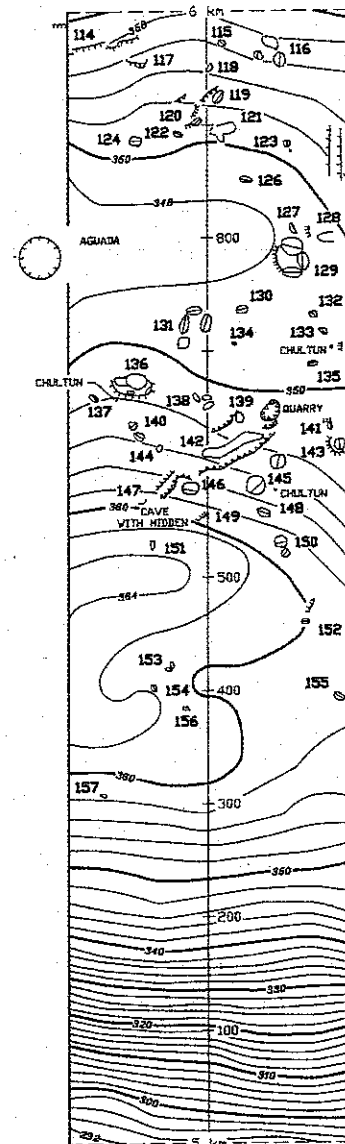
entire range of residential units from small, single structures to large imposing groups, nearly identical to the community patterns recognized in the central Peten area. Indeed, at Laton, there is a small "temple" that probably served administrative and ceremonial functions for the community (Figure 7). Laton is the location of the obsidian production site.

### Implications for Maya Community Patterns

Despite the scattering effect produced by the dispersed primary agricultural resources in the Maya lowlands, there are important connections among the scattered settlements and communities. Among the distinct resource zones, there is an evident pattern of structure density coupled with residential unit size and composition. The more complex residential units and more diverse communities were located in zones of greater access to primary agricultural resources. Where resources were lacking, settlements were predictably simple and homogeneous.

This pattern suggests that connections among communities and settlements were accomplished through both direct and indirect means. Clues to the links are found in the interpretation of the administrative hierarchy as reflected in the distribution of large, and presumably elite, residential units (for example Freidel 1981). These can be taken as an indication of the importance of an area for management and integration. In the patterns of settlement distribution and aggregated communities, there were tiers to the administrative presence. This hierarchy was associated with the presence and availability of primary agricultural resources.

Consistently, all areas of primary resources exhibit an elite presence in the form of large, complex, and imposing residential units. There was, however, some differentiation among the elite. The small.



EL PILAR  
TRANSECT  
272

M N

0 40 80  
meters

5-6 km

North of River

Figure 6. The Laton Community on the El Pilar Transect.



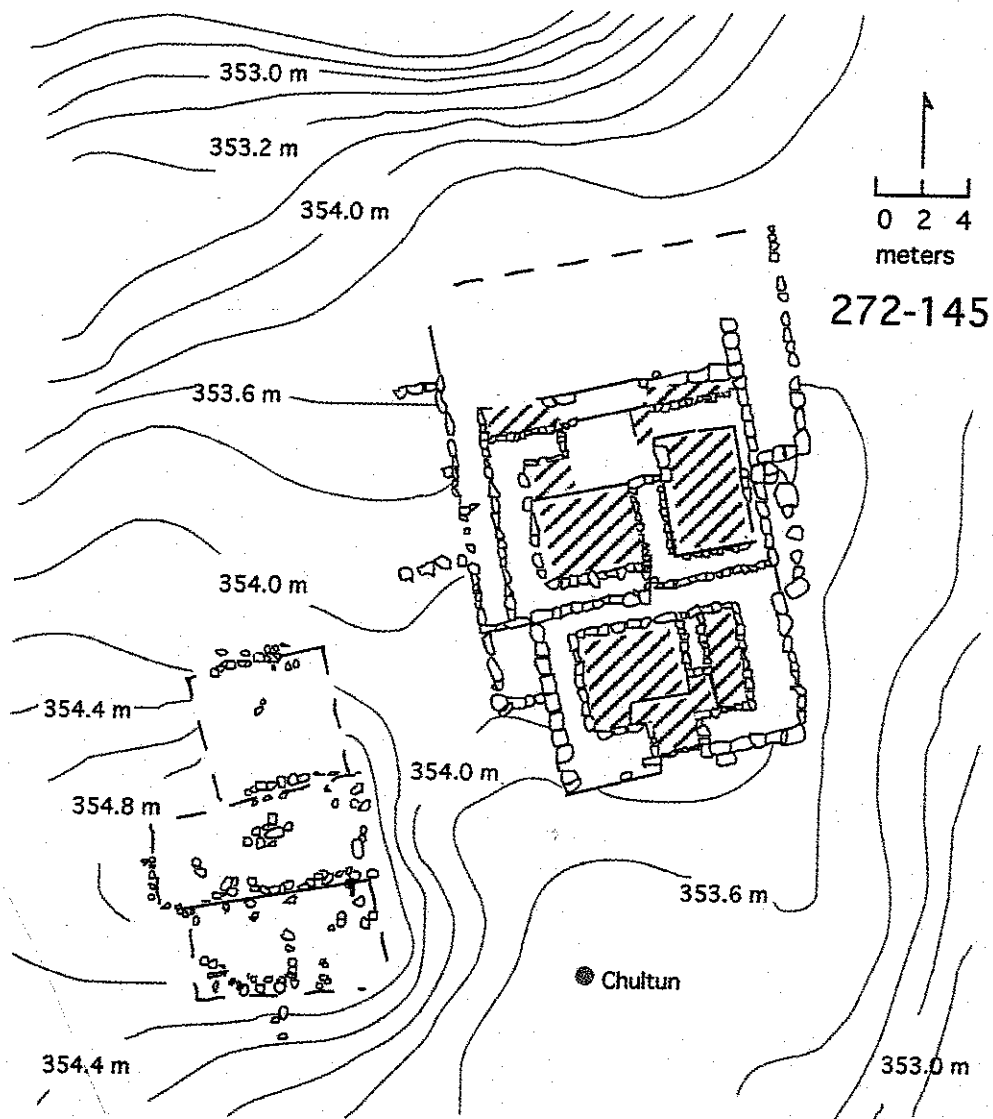


Figure 7. The elite administrative residential unit at Laton.

patches of primary resources, with 100 to 200 str/sq. km, form rural communities with at least one large, elite residence that could have served as the administrative focal point for the community. The elite residences of rural communities were, on average, smaller than those at centers. Larger patches of primary resources have correspondingly larger areas for settlement and support higher settlement densities. Greater variation was found in the nature of these settlements. In addition to the

presence of elite residential units, there were often formal centers.

Invariably, areas with low settlement densities were spread out in secondary agricultural resource zones. Such areas did not achieve sufficiently large aggregates to warrant direct organizational integration as communities. Furthermore, resident elite apparently did not directly monitor these zones. Such dispersed settlements probably

were linked indirectly to more formal communities, where elites were present.

In essence, the relationship between settlement and resources observed for the Maya Lowland region as a whole, consistently points to the importance of primary agricultural resources. This pattern of association between settlement and environment is seen at the regional scale, with settlement density and size of major centers, and at the local scale, in terms of settlement density and composition. Thus, the pattern found at the regional level is equally apparent at the local level. The centralization process involved the mobilization of community farming production by resident elite administrators, organized hierarchically with respect to each other and their community resource base. The highest-level elite logically resided at centers in largest areas of primary resource zones; whereas the lowest level elite were relegated to manage small areas of primary resources. This left the secondary resource zones, with their few settlements, outside the direct control of the hierarchy.

### **Community Integration and Centralization among the Maya**

As an agrarian civilization founded on the productive capacity of land, resource control at the community level was important and the direct management of community production was critical. Recognizing the pattern of the lowland Maya economic landscape as a mosaic patchwork that forced farmers away from centers puts the subsistence economy in apparent opposition to the political economy. Local resident elite, however, would have forged and maintained the key links for the administrative hierarchy. Household production at the community level and community integration at the local level would be built upon the relationship of local elite to a central power. Local elite who negotiated community production within the

context of their political economy would manage the subsistence production of the individual communities.

Alliances built in this fashion are tenuous and constructed on the shifting and fragile basis of prestige and power. While the settlement pattern hierarchy demonstrates evidence of the tiered links from the centers down to individual communities, it is as yet unclear exactly what the ties were from communities up to the centers.

A detailed example of the kind of links that may have existed between communities and centers comes from the small ridgeland community of Laton of the Belize River area (see Figure 6). Ridgeland communities, as a whole, exhibit a significant amount of heterogeneity and diversity, largely due to the fact that the majority of the settlement of the Belize River area is found in this zone. This concentration of settlement presents the contrast between the haves and have-nots, the administrative units vs. farming households, and established homes vs. temporary field houses.

Households involved in subsistence production overwhelmingly characterized the area. Agriculture was obviously an important economic activity for local inhabitants, the fertile ridgeland being the cornucopia of the area. Additionally, multiple service and production specialties were coordinated and supported by the elite at the community level (cf. Brumfiel and Earle 1987). The presence of special services and products provided a means whereby local community elite could demonstrate their ability and distinction, as well as their relationship to the high central elite powers.

At major centers, such as El Pilar or Tikal, the public monuments (stelae, temples, ball courts, acropolis) themselves symbolize control and power. There, resident elite used monumental symbols as an ample demonstration of resource and population control. In contrast, smaller communities,

with much more limited administrative components typically lacking major public monuments, were left with a visual void so that subtler forms of power connections needed to be invoked. This void is where control of exotic commodities, such as obsidian, may have come into play.

While the overall quantities of obsidian recovered at lowland Maya sites are not voluminous, the procurement, production, and distribution of this material has been the focus of significant investigative attention (Ford et al. 1997; Hammond 1981; Moholy-Nagy et al. 1984; Nelson 1989; Rice 1984; Rice et al. 1985; Sidrys 1976). This is primarily because, in the case for the lowland Maya region, this material comes from no less than 300 air km away, and is found most commonly in the form of prismatic blades. Obsidian prismatic blade production would have required specialized training and ability (Clark 1988; Clark and Bryant 1997; Hinzman 1997; Crabtree 1968; Sheets 1975; Torrance 1986). Nevertheless, the blades are ubiquitous in that they occur in almost every context from private residential middens to public ceremonial caches. Even with its almost universal distribution among the Maya, the obsidian prismatic blade is found in significantly greater quantities among elite residences and centers and minimal quantities at small residential units.

Because of the differential distribution of obsidian prismatic blades, they have been taken as an indicator of wealth, even though the presence of obsidian at the most humble houses seemingly suggests a utilitarian function (see Smith 1987). Remarkably, given the wide distribution based on the volumes of excavations that have been conducted throughout the Maya lowlands over the past century, principally focused at centers and their residential units, no definitive production loci have been identified. Moreover, obsidian production by-products (debitage and cores) have been

regularly recovered under the most ritualized situations at centers (Olson 1994:42; e.g., Tikal, Coe 1959, 1961, 1965, 1990; Moholy-Nagy p.c. 1976, 1997, Moholy-Nagy et al. 1984; Belize centers, Pendergast p.c., 1979, 1981). Although prismatic blades enjoyed a wide distribution among the Maya, the by-products of obsidian blade production was restricted. Both obsidian debitage and cores were deposited in special dedicatory contexts at centers, including building and stair foundations, sub-stela caches, and burials (see Olson 1994). Certainly, the presence of actual debitage and cores at centers indicates that production occurred somewhere, perhaps locally. But locating any production loci had remained elusive. Other than the highly ritualized deposits of obsidian by-products, this lack of production loci has impeded efforts to understand fully the place of obsidian in the ancient Maya world.

Investigations in 1984 by the Belize River Archaeological Settlement Survey (BRASS) of residential units of the rural community of Laton, surprisingly revealed that one of the large, elite residential units (272-136) was heavily involved in an obsidian prismatic blade production industry. This residential unit was composed of three structures surrounding an open courtyard with a terrace at one side (Figure 8). Full-scale excavations within this unit in 1992 focused on defined open areas of plazas, terraces, and platforms in an effort to identify the nature and scope of the obsidian production activities. The excavations revealed heretofore-unseen concentrations of obsidian production by-products in all areas of the residential unit.

No excavation area at the residential unit yielded less than 3,000 obsidian pieces/m<sup>3</sup>. One small terrace deposit of blade debitage contained over 23,000 pieces of obsidian; a density equal to 1.7 million pieces of obsidians/m<sup>3</sup> (Area A Figure 8, and Figure 9). Another deposit behind a structure wall

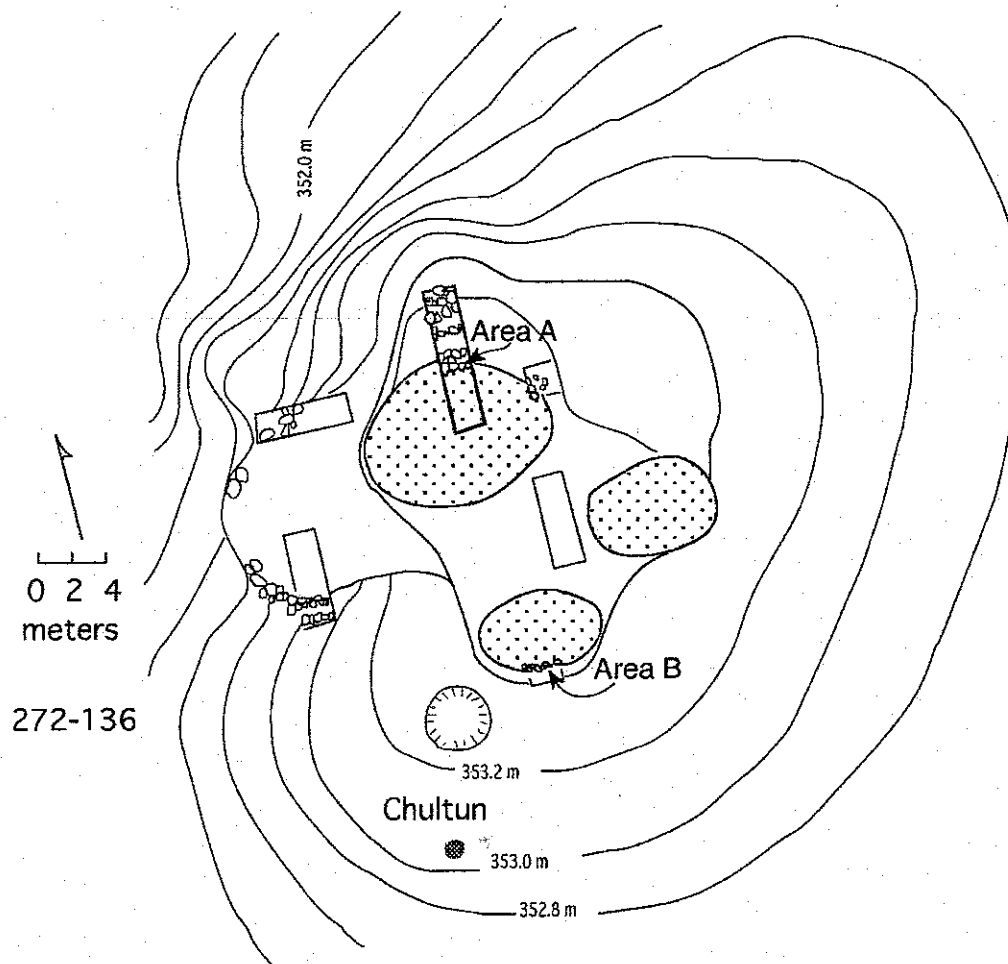


Figure 8. The Obsidian (production residential unit with excavation areas indicated).

contained 39 complete, but exhausted, prismatic blade cores (Area B Figure 8, and Figure 10). These two deposits suggest provisional discard areas were used to stage, or “stash,” obsidian by-products for future use (Olson 1994). In light of the distinct distribution of such debitage at major centers, it seems very likely that these obsidian “stashes” were destined for special purposes, and one such possibility is ritual deposits at centers.

The obsidian assemblage from this rural Laton community residential unit is

unique because no such collections have been reported from any other lowland Maya household context. In fact, this is the first obsidian production site uncovered to date from the central Maya lowlands. The only concentrations of materials similar to those recovered at the Laton production site have been found in highly ritualized contexts at centers—caches and burials (Olson 1994). These are clearly specialty deposits, representing production debris unrelated to production loci. Production loci are distinct in assemblage composition (Clark p.c. 1987).



**Figure 9.** Debitage from the "stash" at 272-136.



**Figure 10.** Cores from the collections at 272-136.

Moreover, the debitage and other obsidian by-products collected at the Laton community production site are equivalent to production debris assemblages from sites observed much closer to obsidian sources in highland Guatemala and Mexico (Santley 1984; Clark 1986; Healan 1995; see also Gaxiola and Clark 1989).

While *procurement* of obsidian into the Maya region may have been centralized, obsidian *production* apparently was not. While obsidian procurement may have been in elite hands, that of production was decentralized. The example of Laton suggests that the elite of dispersed communities were strategic in this political-economic endeavor. If centers were the hub of resources for the local area and trade nodes for the region, then the centralized leadership was in the position of primary distributors of imports, such as obsidian. One possibility is that the elite leadership at centers, as distributors of exotic commodities and wealth goods and redistributors of local products, apportioned various resources as a means for consolidating the allegiance of the dispersed communities in the local area. Exotics would be particularly useful as such a commodity because of their known scarcity.

Obsidian is a conspicuous exotic (Rathje 1971, Tourtellot and Sabloff 1972, P. Rice 1984, Gaxiola and Clark 1989; Sidrys 1976). Elites from dispersed communities around centers could use obsidian as a visible display to rural peasant constituents of their political connections. Control of obsidian prismatic blade production would also allow community-level elites to demonstrate their link to aristocratic hierarchy at major centers while simultaneously accruing local power with community constituents by distributing valued obsidian prismatic blades.

This interpretation views the community as the basic social component of the ancient Maya hierarchy. The distribution

of agricultural resources forced farmers into dispersed locales, creating a centrifugal force against centralization. Elites focused on the control of the primary agricultural resources independent of community size. But to resolve the problem of integration without nucleation, communities, both rural and central, would be subject to coordination by a hierarchy of elite management and administration. This is reflected locally, as well as regionally, in the settlement patterns of the lowlands. Beyond primary agricultural resources, elites would have focused on several key arenas: control of production and distribution of exotics (as with obsidian, but possibly other resources such as jade), maintenance of ceremonial sites, administration at the community and local levels, and interaction at the regional level.

The critical organizational links between the rural peasant farmers and the major centers are hinged on community leadership. Many of the dispersed communities of the ancient Maya in the central Peten area, as well as in the Belize River area, had the potential for self-sufficiency in the realm of the subsistence economy. This would have enabled them to challenge cohesion by exerting independence. But such autonomy appears to have been forsaken for hierarchical coexistence with the major regional centers. This suggests the existence of a balance of power between rural community leadership and centralized area leadership that operated exclusively within the political economy. Visible control of production of exotic luxuries, such as obsidian at Laton, could be just the type of dual-purpose "currency" that would have been useful in reinforcing daily political activities at the community level while cementing ties to regional centers.

### Interpretation

The regional settlement patterns examined here demonstrate most dramatically the dimensional importance of agriculture for the Maya. This is reflected in settlement density and scale of public architecture. That is, the larger the proportions of primary agricultural resources, the higher settlement densities, and the more extensive the public centers. In essence, the more people you have, the more labor can be directed towards public works—whether in the form of open plazas for all to see or inaccessible private regal domains. That same relationship between settlement and resources exhibited at the regional scale is repeated, on a smaller scale, at the local and community levels. Local community diversity and the degree of investment in elite and public architecture is proportionate to the local resources (cf. Stone 1991; Wilk 1989).

Hence, the variable distribution of centers and the hierarchical distribution of elite across the Maya landscape. Elite at the major centers with the greatest resource base were able to garner more labor for their private ends. They exhibit larger residential units than rural community elite. Elite of the rural areas, with direct control over the immediate resources of the community, would not have equivalent labor availability when compared with the elite of large centers. Consequently, their residences appear smaller than those of higher-level elite, but nonetheless imposing by local community standards. This tiered settlement pattern is not dissimilar to Bullard's (1960, 1964) view of ancient Maya settlement pattern where his hamlets would be the rural communities, his districts would be equivalent to local centers, and his zones would be the major regional centers.

This pattern of settlement distribution also demonstrates that a tiered settlement hierarchy existed in part to distribute elite

administrators across the rural agricultural zones. The presence of a hierarchy of settlements particularly reveals how the administrative process linked centers to dispersed communities. It does not, however, address how the administrative process links from communities to centers. Rather, this process is reflected in household activities at the community level, and more specifically the activities patronized by the elite. Self-sufficiency in terms of the subsistence economy may have been an option for dispersed communities of the Maya lowlands. These rural communities were the closest to subsistence production. Consequently, the activation of the hierarchical links among rural elite depended primarily upon interdependence within the political economy.

The links within the political economy would necessarily fall outside of the utilitarian or subsistence realm and into the realm of exotics and luxuries (Brumfiel and Earle 1987). These would not be a requisite to sustain life, but would be requisite for full participation in the elite political economy of the ancient Maya. Many restricted items could fall into this category and most would be derived from long-distance exchange. Obsidian has long been recognized as an enigmatic product in the Maya lowlands (see Tourtellot and Sabloff 1972). Curiously, production of obsidian has remained one of the real mysteries of the Maya. Data show that by-products of obsidian production occurred in only flamboyantly ritualized deposits at centers. And, despite all the excavations, production by-products had never been recovered in a situation ostensibly related to production in either ceremonial precincts or residences at centers.

Examination of settlement and community patterns of the Belize River area finally yielded the first major obsidian production site in the central Maya lowlands. Interestingly, this production site was located



within a rural community where little imposing public architecture was present. This would be precisely the type of area where conspicuous production could be fully appreciated. These peripheral, rural, low-level elite could employ devices, such as conspicuous obsidian production, to bolster their image within the rural community as part of the larger network of the elite political economy (see Vogt 1970). These same rural elite could control the production by-products, which were highly restricted, to forge their political links with higher-level elites at centers. In conserving and curating obsidian production debris, these elite could literally spend this "political capital" in important elite sponsored events at centers, thus participating in prominent funerals and ground breakings for buildings or stela. Through these methods, the administrative hierarchy of the ancient Maya was able to mobilize dispersed community production and expand the range of community integration. From this analysis, a striking picture of the Maya elite hierarchy, manifest in the settlement patterns of the region, begins to emerge. The settlements are concentrated in the most productive agricultural zones, though the zones are widely distributed across the landscape. Despite obvious obstacles to centralization, Maya civilization flourished, demonstrating the flexibility of an essentially fixed hierarchically organized administrative system. This was true, at least, until the period of collapse.

The archaeological research of the Maya area has developed a considerable database identifying the hierarchy of the household, the community, and the administrative center. This appears to be clear and sufficient evidence of the tiers of administration, and the long span of prehistory in the Maya area demonstrates the effectiveness of their administration. Still, the mechanisms linking together the tiers in

the hierarchy are not well understood. To understand the relationships between communities and centers, research needs to be oriented more to the signatures of the political economy, where substantial power resides. Therein lies the basis for the mobilization of subsistence production at the community level and the integration of communities at the local level. Resource mobilization and community integration provided the fundamental building block and the wherewithal to negotiate regional interaction.

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