CHAPTER TEN

Social Complexity in the Aztec Countryside

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AZTEC SOCIETY AT THE TIME of the Spanish conquest was highly complex. Inequality was pronounced, with commoner and noble classes each divided into a number of ranks. Occupational specialization was common, and goods were exchanged through a variety of channels, including markets, professional merchants, and tribute. The political system was based upon a multilevel hierarchy of power and authority, and religion was also highly differentiated, both conceptually and organizationally. The Aztec capital Tenochtitlan, one of the largest cities in the world in A.D. 1500, was entirely representative of this complexity in all of its forms.

This co-occurrence of urbanism and social complexity, coupled with a traditional archaeological dichotomy between urban and rural, has led scholars to an implicit assumption that the inhabitants of nonurban or rural areas in ancient central Mexico were simple and homogeneous peasants. This chapter suggests that this characterization is not only oversimplified but also highly inaccurate. In fact, the Aztec countryside was a setting for small, rural communities with socially complex populations. Results of archaeological excavations of Late Postclassic (Aztec period) sites in a rural area in Morelos, Mexico, reveal the presence of both horizontal and vertical social complexity. These findings have important implications for our understanding of Aztec society and economy.

Social Complexity

ARCHAEOLOGY AND COMPLEXITY

Complexity is an attribute of open systems, and the concept has been discussed in the literature of general systems theory in relation to physical, biological, and social systems (Simon 1962; Pattee 1973). Although most authors have avoided formal definitions of complexity or complex systems, the general sense of the concept is given by Herbert Simon:

> Roughly, by a complex system I mean one made up of a large number of parts that interact in a nonsimple way. In such systems, the whole is more than the sum of the parts, not in an ultimate, metaphysical sense, but in the important pragmatic sense that, given the properties of the parts and the laws of their interaction, it is not a trivial matter to infer the properties of the whole. (Simon 1962:468)

Archaeologists, for whom whole cultures traditionally have been important units of analysis, apply this concept most commonly in terms of "cultural complexity." Evolutionary research has long been concerned with the origin and development of complex societies and cultures (e.g., Wenke 1981; Kowalewski 1990), generally as manifested in states and chiefdoms. Recently, a number of archaeologists have concluded that many prehistoric cultures previously described as simple or egalitarian in fact were more complex. Cultures in the American Southwest, formerly viewed as egalitarian tribes, are now interpreted by some as complex (Lightfoot and Upham 1989). Even some hunter-gatherer societies are now described in this manner (e.g., Price and Brown 1985).

The status of agrarian states, like the Aztec or Maya, as complex cultures is not at issue. Countless archaeological and ethnohistorical studies of these societies have demonstrated that they satisfy almost any operational definition of the term. Nevertheless, the spatial configuration of social processes and institutions in complex societies has received little attention.

Linked to the archaeological tendency to view complexity as an attribute of whole cultures is a common association of specific manifestations of complexity (e.g., social stratification, craft specialization) with urbanism. This supposition produces models, both explicit and implicit, of rural areas inhabited by simple, homogeneous peasant farmers.

If, however, we shift our focus from complexity as an attribute of whole cultures to complexity as a feature of specific areas, settlements, or other social components, we may reveal important aspects of rural complexity. Specific material manifestations of social complexity can be investigated to determine empirically the extent to which rural society in ancient states may have been simple or complex. This approach focuses on social organization and institutions and uses the concept of "social complexity" rather than the more common "cultural complexity." The following section discusses three components of social complexity in rural areas: heterogeneity, inequality, and connectivity.

HETEROGENEITY, INEQUALITY, AND CONNECTIVITY

McGuire (1983) presents a particularly useful archaeological treatment of social complexity that discusses the horizontal and vertical dimensions of complexity under the terms "heterogeneity" and "inequality" (following Blau 1977). In this approach, *heterogeneity* "deals with the frequency of individuals among social parameters" (McGuire 1983:101). McGuire identifies three components of heterogeneity: the number of hierarchical levels in a society, the number of dimensions that differentiate groups and statuses, and the degree of independence between social parameters.

Hierarchical levels are inferred most commonly by archaeologists from settlement patterns. Less complex cultures tend to have fewer discrete levels of settlement, whereas states tend to have many levels in their settlement hierarchy (Wright and Johnson 1975). Within ancient Mesoamerica, the lowland Classic Maya categories of house, patio group, cluster, minor center, and major center make up one of the best-documented examples of a complex settlement hierarchy (Ashmore 1981). This approach, rather than the whole-culture applications of McGuire and others (e.g., Lightfoot and Upham 1989), can be applied easily to specific regions. The second component of heterogeneity is the number of dimensions of differentiation. The dimension most frequently analyzed by archaeologists is craft production. The degree of specialization and the number of specialized crafts provide measures of heterogeneity. McGuire (1983:107, 127) discusses dimensions of differentiation in terms of non-kin institutions, which can include sodalities, and religious and political organizations, in addition to economic institutions.[1]

McGuire's second dimension of complexity, *inequality*, "refers to how unequal the distribution of a population is along graduated parameters" (McGuire 1983:102). Archaeologists traditionally have investigated inequality along the classic Weberian dimensions of wealth, status, and power, based on architecture, portable domestic artifacts, and burials. Architecture generally is the strongest indicator of inequality because it embodies all three dimensions and reflects the greatest energetic investment (signaling power and wealth) of any artifact category (see Abrams 1989).

In addition to McGuire's dimensions of heterogeneity and inequality, a third can be added, one that I call *connectivity*. This term denotes the extent to which households are connected with nonlocal economic and political institutions. Although connectivity could be subsumed under heterogeneity and inequality, I separate it here because of its importance in considerations of rural complexity. The traditional model of homogeneous peasants (e.g., Redfield 1941) assumes that rural farmers were isolated from many of the large-scale political and economic currents of their time, except perhaps in their role as producers of tribute for foreign lords. However, archaeological evidence shows that rural Aztec populations not only exhibited features of heterogeneity and inequality but also participated heavily in long-distance trade systems.

RURAL SOCIAL COMPLEXITY AND ANCIENT MESOAMERICA

As commonly used, the concept "rural" has two connotations. First, it is sometimes used to describe individual settlements or small areas where agricultural activities predominate. In this approach, rural settlements are distinguished from urban settlements (see Chapter 9 by Falconer). In a second sense, one employed in this chapter, rural is an attribute of regions, not settlements. Thus, a rural area can be defined as either a region with a low level of urbanization (i.e., few towns, or a low proportion of the population living in towns and cities) or an area far away from large cities. Whichever connotation of the term is used, scholars should avoid placing too much emphasis a priori on the distinctions between rural and urban contexts or settings. An overemphasis on the rural-urban dichotomy often leads to the characterization of urban areas as complex and rural areas as simple, a misleading interpretation. In an important paper, Anthony Leeds (1980) suggests that

> any society which has in it what we commonly call "towns" or "cities" is in *all* aspects an "urban" society, including its agricultural

> and extractive domains . . . the terms "urban" and "rural" come to stand to each other not as opposites and equivalents. Rather, the inclusive term describing the whole society is "urban" while the term "rural" refers only to a set of specialties of an urban society characterized by being inherently linked (under any technology known) to specific geographical spaces. (Leeds 1980:6–7)

Leeds's functional approach to rural and urban phenomena allows for the possibility of social complexity in rural areas, a situation reported in many of the chapters in this volume. This line of thought is compatible with the French rural history approach (e.g., Bloch 1931; Braudel 1981), which analyzes peasant society and rural areas on their own terms rather than as the simple homogeneous food-producing sectors of state societies. Graffam's (1992) study of agricultural production in the Lake Titicaca area after the collapse of the Tiwanaku state demonstrates the archaeological relevance of the rural history approach and provides a concrete example of the need to analyze rural areas on their own terms in order to appreciate the nature of rural society and its complexities.

Traditional approaches to ancient Mesoamerican states have tended to ignore the possibility of rural social complexity for several reasons. First, both of the major theoretical approaches to urbanism used by Mesoamericanists—the demographic-sociological approach (e.g., Sanders and Webster 1988) and the functional approach (e.g., Blanton 1976; Kowalewski 1990)—define urbanism at least partly in terms of social complexity. Neither approach rules out the possibility of rural complexity. Nevertheless, their heavy focus on urban settlements themselves tends to divert attention from the countryside, unlike Leeds's (1980) more inclusive approach to urban and rural issues.

A second reason for the neglect of rural complexity is that some of the most archaeologically influential works by Mesoamerican ethnologists describe peasant populations as simple homogeneous societies. Robert Redfield's *The Folk Culture of Yucatan* (1941) is quite explicit about the association between cities and complexity, and between peasants and simplicity, while Eric R. Wolf's *Peasants* (1966) does not deal with the possibility of significant social variation within rural populations. The more recent regional approach of Carol Smith (1976), Leeds (1980), and others helps correct this bias by examining the spatial distribution of economic and social institutions and activities.

The regional approach has been applied in Mesoamerican archaeology by Blanton (1976), Kowalewski (1990), and others, but this work highlights a third reason for the neglect of rural complexity. Even large-scale surveys that include a focus on rural areas cannot investigate rural complexity without the excavation of rural sites. Some information on the distribution of elites or the location of craft production can be generated with surface archaeology (e.g., Brumfiel 1980; Kowalewski 1990), but confident identifications of complex institutions, their controlled dating, and quantitative analyses of their configurations require excavated data, particularly from domestic deposits (Hendon 1992). In other words, we need more excavations of rural sites employing the approach of "household archaeology," as exemplified by many of the chapters in this volume (see also the papers in Santley and Hirth 1993).

Late Postclassic Central Mexico

RURAL AND URBAN IN THE BASIN OF MEXICO

Aztec society usually is described as socially complex and highly urbanized. Indeed, the Aztec capital, Tenochtitlan, was a huge primate city with nearly 200,000 inhabitants and a high degree of social differentiation (Rojas 1986). Most Aztec urban settlements were considerably more modest in size and complexity, however. The predominant urban form was the city-state capital, a small settlement with low-level urban functions that is more properly described as a town than a city (Hicks 1982; M. E. Smith 1989:456–457; M. E. Smith et al. in press). The primary institutions in Aztec city-state capitals were political (the palace of the king) and religious (the central temple-pyramid). These settlements incorporated social complexity into the political and religious dimensions (Sanders and Webster 1988). Palaces, as elite residences and administrative buildings, provide evidence of both inequality and heterogeneity, whereas the religious complexity signaled by temples is an example of heterogeneity.

There is some variation in the extent to which Aztec city-state capitals were scenes of economic heterogeneity in the form of craft specialization. Brumfiel's (1987) ethnohistoric research suggests that the production of luxury or elite crafts (e.g., goldsmithing, lapidary production, feather art) was centered on urban palaces, whereas utilitarian crafts were produced by part-time rural artisans. However, her intensive surface collections at Huexotla yielded little evidence for specialized production at this city-state capital (Brumfiel 1980). On the other hand, recent surface collections and excavation at Otumba, another city-state capital, reveal evidence for intensive production of both utilitarian (cloth, ceramic figurines, obsidian tools) and luxury (obsidian jewelry) items in the urban core of the site (Charlton, Nichols, and Charlton 1991). Data from these Aztec city-state capitals, the only two studied intensively by archaeologists, suggest highly variable economic roles for these settlements.

The extent to which rural areas of the Aztec Basin of Mexico were socially complex is difficult to judge, given the limited state of current archaeological knowledge. Surface collections document the presence of at least some craft production outside the city-state capitals, but the intensity or scale of these industries is difficult to gauge (e.g., Sanders, Parsons, and Santley 1979:172–181; Brumfiel 1980, 1987; Spence 1985). Excavations at the village site of Siguatecpan uncovered an elite residence, an obsidian workshop, and a household textile industry (Evans 1988). Unfortunately, this is the only Aztec rural site extensively excavated in the Basin of Mexico.

Comparative data suggest that the Aztec countryside should have been the setting for a high level of social complexity. Rural population was quite dense (Sanders, Parsons, and Santley 1979:163–171), and, in most cases, social complexity is correlated strongly with population density. Carol Smith's (1976) comparative research suggests that the highly commercialized Aztec economy, integrated by extensive marketplace exchange (Berdan 1985; Hodge 1992), should have favored the presence of elites in rural, as well as urban, settings. Therefore, the palace at Siguatecpan probably is typical of rural settlements. The rapidly growing population and the accompanying probability of land shortages led to agricultural intensification (Sanders, Parsons, and Santley 1979:249–281; Evans 1990). These same forces are linked cross-culturally to the development of rural craft industries (Thirsk 1961; Arnold 1985:171–196). In the absence of excavations at more sites in rural areas, these suggestions cannot be evaluated. However, recent research in a rural area outside the Basin of Mexico provides more complete evidence for rural social complexity in Late Postclassic central Mexico.

EXCAVATIONS AT CAPILCO AND CUEXCOMATE IN MORELOS

The Postclassic Morelos Archaeological Project undertook excavations at the Cuauhnahuac phase (Late Postclassic) sites of Capilco and Cuexcomate in Morelos, Mexico, in part to investigate the possibility of rural social complexity in this area. Ethnohistoric documents and prior archaeological research suggested that western Morelos had dense rural populations that were well integrated into Aztec period exchange networks. Preliminary surface work at these sites by the Xochicalco Mapping Project (Hirth in preparation) had revealed residential architecture with high surface visibility and artifact collections that showed interhouse variation, suggesting differences in wealth and cotton textile production.

Capilco and Cuexcomate were excavated in 1986 with a research design intended to gather data on household conditions (including wealth levels and craft production), residential architecture, and community organization. A random sample of houses at each site was tested to investigate sitewide patterns of variability. Selected houses and large exterior areas were completely cleared to address domestic conditions and activities in greater detail, and a number of nonresidential structures and features were excavated, including a temple-platform, possible granaries, ritual deposits, and agricultural terraces. The excavations and architectural remains are described in M. E. Smith (1992).

Three chronological phases are represented at Capilco and Cuexcomate. The Temazcalli phase (A.D. 1200–1350) is only present in two refuse deposits at Capilco. The Early Cuauhnahuac (EC) phase (A.D. 1350–1430) saw the founding of Cuexcomate and a pattern of growth at Capilco, and both sites continued to grow in the Late Cuauhnahuac or (LC) phase (A.D. 1430–1550). Both sites were abandoned early in the Spanish colonial period, probably in response to Spanish administrative decree. This chronology is discussed in M. E. Smith and Doershuk (1991).

Demographic estimates, based upon our random sample of houses and ethnohistoric data on household size in Morelos, are presented in Table 22. Capilco was a small nucleated

Table 22. Demographic Data for Capilco and Cuexcomate

	Phase		
Site	**Temazcalli**	**Early Cuauhnahuac**	**Late Cuauhnahuac**
Number of houses			
Capilco			
Elite	—	—	—
Nonelite	5	13	21
Cuexcomate			
Elite	—	4	7
Nonelite	—	35	132
Number of persons			
Capilco, nonelite	28	72	116
Cuexcomate			
Elite	—	44	77
Nonelite	—	193	726
Total	—	237	803
Settlement area (ha)			
Capilco	0.14	0.60	1.15
Cuexcomate	—	9.94	14.58
Population density (persons/ha)			
Capilco	197	121	101
Cuexcomate	—	24	55

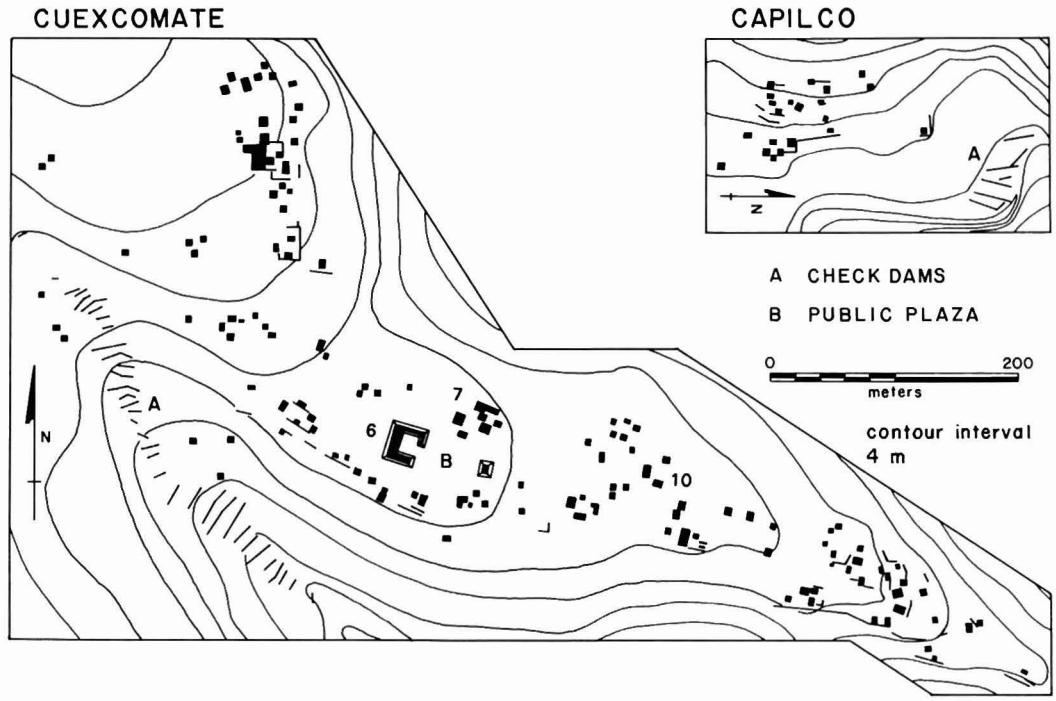

Fig. 64. Cuexcomate and Capilco, showing the maximal extent of settlement (Late Cuauhnahuac phase). The locations of three patio groups discussed in the text, Nos. 6, 7, and 10, are indicated.

village, growing from about five initial houses to a maximum size of 21 houses in the LC phase. Cuexcomate was a larger and more complex town settlement in both the EC and the LC phases, with a centrally located public plaza defined by a temple-platform, an elite residential compound (there were separate compounds in each phase), and another special residence of some sort. The patterns of demographic growth indicated in Table 22 also appear to characterize the larger region around the excavated sites, suggesting a massive population expansion in the fourteenth and fifteenth centuries (M. E. Smith 1992). Figure 64 shows plans for the two sites during the LC phase, the time of their maximum size. As discussed later, the distinction between the village and the town accounts for much of the variation in social complexity at the sites, with Cuexcomate showing considerably more evidence for complexity, although a number of attributes of heterogeneity also are present at Capilco.

Heterogeneity

THE SETTLEMENT HIERARCHY

Excavations and mapping by the Postclassic Morelos Archaeological Project resulted in the identification of four hierarchical classes or levels of settlement: the house, patio group, house cluster, and macrocluster. Early colonial census documents from five towns in Morelos also describe four settlement levels that correspond to groups with important social and economic functions. These are the *calli* (household), the *ithualli,* the *chinamitl,* and the *calpulli* (see Carrasco 1976). Formal comparisons between the archaeological and ethnohistoric hierarchies reveal that they are identical, permitting the use of ethnohistory for social interpretations of the archaeological categories and the use of archaeology for economic interpretations of the ethnohistoric groups. This four-level hierarchy is described briefly here; the reader is referred to M. E. Smith (1992, 1993) for more detailed descriptions and analyses.

Figure 65 is a schematic representation of the settlement hierarchy. The *house* is the basic level of residence. Most houses were small adobe structures with stone foundations, although some elevated platform houses also were present (see the discussion of inequality later in this chapter). Census documents reveal the presence of many joint family households inhabiting single structures in contact-period Morelos. Many houses were arranged in *patio groups* with two to four houses around a plaza or patio, sometimes with a circular structure (probably a granary), or a rock pile that denotes a ritual artifact dump. Archaeological evidence indicates that each house was a separate residence rather than a specialized struc-

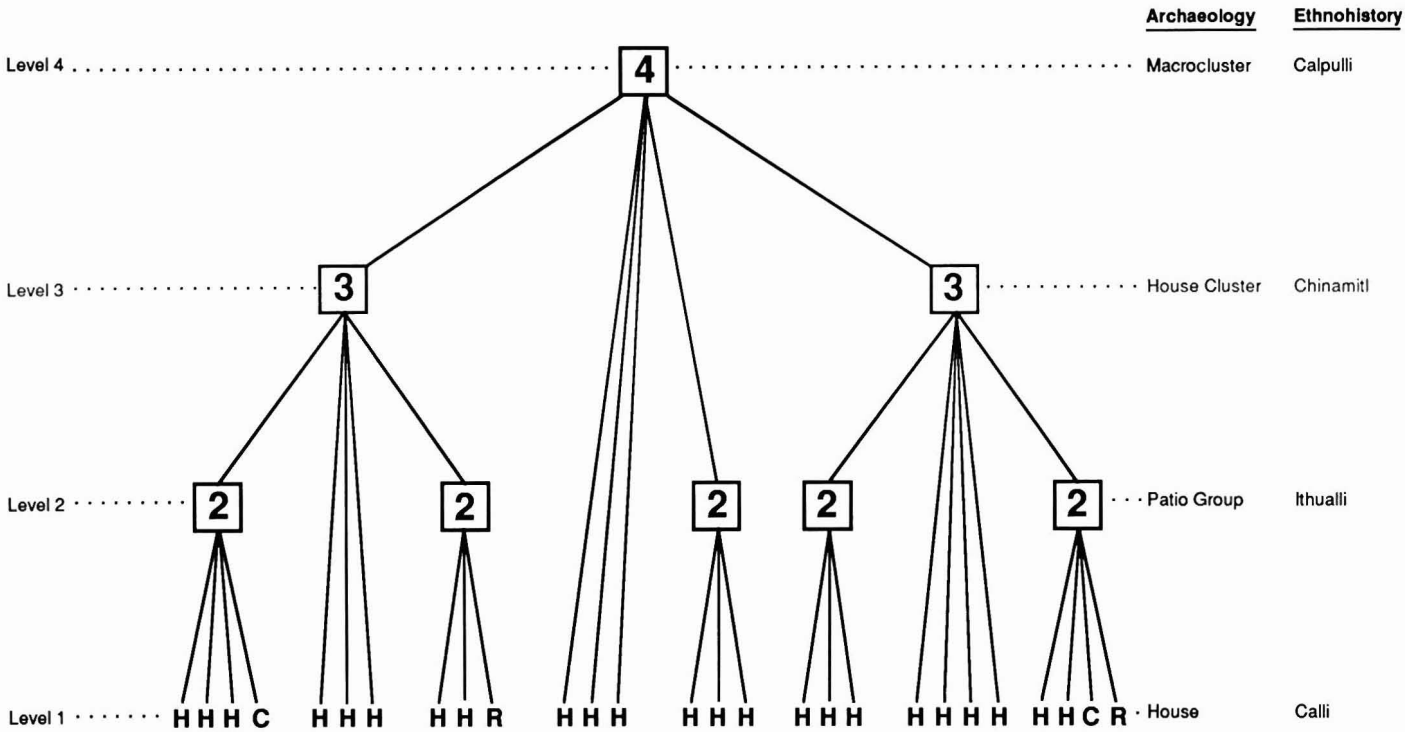

Fig. 65. Cuauhnahuac phase settlement hierarchy in western Morelos. C, circular structure; H, house; R, rock pile.

ture, such as a kitchen or dormitory. These compounds are designated historically by the Nahuatl term *ithualli* ("houses around a courtyard"), and their constituent households were linked by kinship bonds in about half of the cases. Each patio group had a compound head with greater wealth and status than the other household heads. Typically he distributed land to the other households for their cultivation in exchange for tribute payments in goods and services. Both the archaeological and the ethnohistorical data show that the patio group was a widespread unit of great economic and social importance. Carrasco (1976:63) argues that land tenure and tribute obligations played a larger role than kinship in shaping settlement and social organization at this level.

The *house cluster* consists of ten to fifty houses located in close proximity to one another. The site of Capilco consists of a single house cluster, whereas Cuexcomate is composed of three or four clusters (see Fig. 64). The central and northern clusters at Cuexcomate have central patio groups that are large and complex, whereas Capilco and the eastern portion of Cuexcomate are without such nuclei. The census documents use two terms for this unit, the *chinamitl* and the *calpulli*. Since the latter term is also used for larger units, I use the former to denote the house cluster. The *chinamitl* had resident nobles who maintained political and economic control over the other residents. The complex patio groups at Cuexcomate provide archaeological evidence for these cluster heads.

The site of Cuexcomate forms a *macrocluster* that is nucleated around a central public plaza (area B in Fig. 64). The size of Cuexcomate during the LC phase (139 houses) is within the range of *calpulli* units described in the Morelos census documents (120 to 188 houses). The *calpulli* were all under the strict control of a noble who lived among the other residents. Again, the site of Cuexcomate provides a good archaeological illustration of such a unit. In sum, a four-level settlement hierarchy is indicated clearly by the archaeological remains (except for the definition of clusters at Cuexcomate, which must remain subjective until quantitative spatial analyses are carried out), and the social significance of its hierarchial levels is established firmly by census documents (see M. E. Smith 1993).

RITUAL

Three dimensions of heterogeneity beyond that of the settlement hierarchy are evident in the archaeological record. One of these, ritual, exhibits hierarchical variation, and two others, agriculture and craft production, have nonhierarchical patterns of variation.

Archaeological evidence points to a series of ritual activities that pertain to three of the settlement levels already discussed: the house, the patio group, and the macrocluster. Ritual activities are inferred from the formal properties and spatial con-

texts of artifacts, features, and buildings, using functional analogies based on Aztec ethnohistoric evidence (see M. E. Smith 1992 for details). Domestic rituals, centered in and around houses, are signaled by long-handled ("frying pan") incense burners, ceramic figurines, and infant burials. The incense burners are quite abundant, making up between 2 percent and 5 percent of all ceramic vessels in most domestic middens.[2] Figurines are less abundant, but they do occur in nearly all houses. Burials are not common, but seven of the nine excavated burials occur either under the house floor (N = 3) or adjacent to a house (N = 4). Only five of the forty-four excavated houses have burials (although most houses were only tested and were not excavated completely). The evidence thus points to two kinds of domestic ritual: offerings involving incense and perhaps figurines, and burials of infants.

Patio group rituals are signaled by "ritual dumps" or rock piles. These features consist of extremely dense unstratified deposits of domestic artifacts 1–2 m in diameter, capped by a layer of large rocks. They are located in the patio areas of five of the twenty-five patio groups at Cuexcomate (there are no ritual dumps at Capilco). Ethnohistoric parallels suggest that these features were the remains of cycle-ending calendrical rituals in which household possessions were broken and discarded every 52 years. Their locations in patio areas suggest that the rituals pertain to the whole group, not to individual houses.

The existence of a temple platform on the east side of the Cuexcomate public plaza points to ritual activities that pertain to the entire settlement and probably to nearby smaller villages as well. Refuse deposits associated with this structure have high frequencies of incense burners and fine serving vessels for food and drink. Ethnohistoric data suggest the presence of professional priests at Cuexcomate, who may have resided in a distinctive patio group along the south side of the public plaza.

CRAFT PRODUCTION

The major craft industry at Capilco and Cuexcomate, cotton textile manufacture, is visible archaeologically in the form of spindle whorls and spinning bowls (Fig. 66). These artifacts are ubiquitous in the excavated midden deposits. The graphs in Figure 67 (see end note 2 on artifact quantification) show that (1) all excavated houses have spinning artifacts, (2) the overall frequencies are high, (3) these artifacts are not any more common in elite contexts than in nonelite contexts, and (4) a few houses stand out with very high frequencies. Cotton textiles were important items of trade and tribute in this area (Berdan 1987; M. E. Smith and Hirth 1988), and much of the

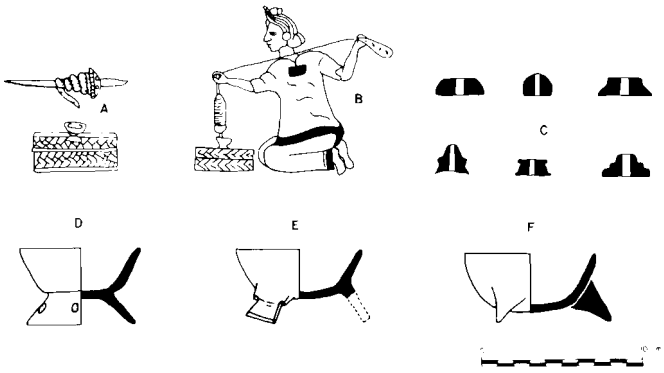

Fig. 66. Ceramic cotton spinning artifacts. A, Aztec spinning equipment (Sahagún 1950–1982, book 8:Fig. 75); B, woman spinning (Codex Mendoza 1992:f.68r); C, small ceramic spindle whorls from Postclassic sites in Morelos; D and E, imported Aztec III Black on Orange spinning bowls from Coatetelco; F, local Morelos spinning bowl from Coatetelco.

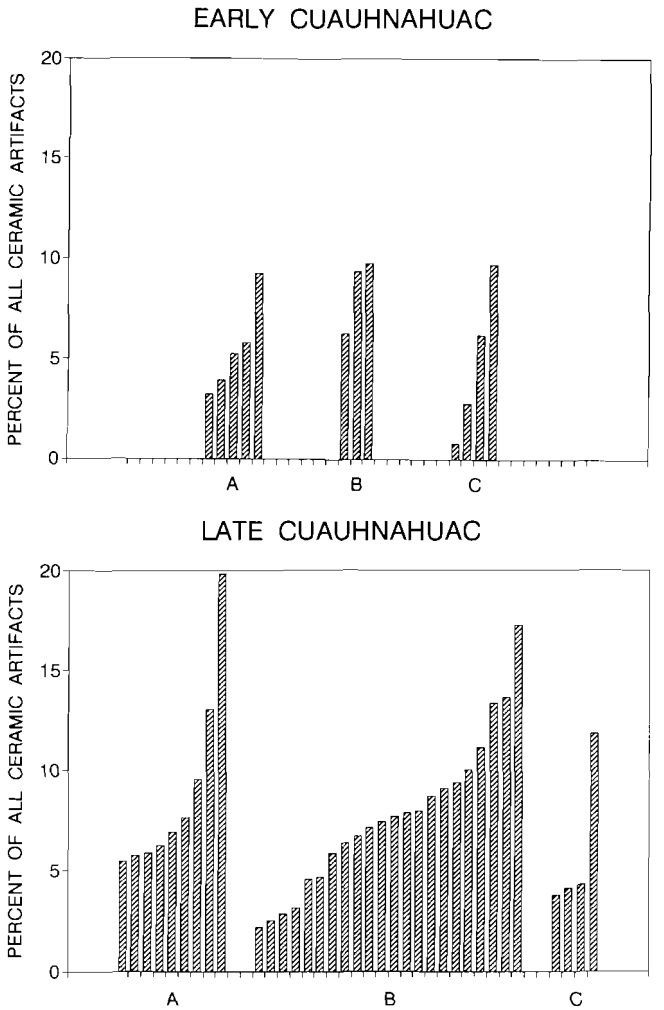

Fig. 67. Frequencies of cotton spinning artifacts in domestic refuse deposits. Each bar represents one house. Houses are grouped into three categories: A, houses at Capilco; B, nonelite houses at Cuexcomate; C, elite houses at Cuexcomate.

cotton production must have been destined for export. Cotton textile production would fit Peacock's (1982:8–11) category of "household industry," which is based on domestic production for both use and exchange, usually by part-time producers. Surface collections at other Late Postclassic sites in Morelos usually include many spindle whorls and spinning bowls, a finding that suggests that textile manufacture was widespread (Smith and Hirth 1988).

Although obsidian artifacts are quite abundant in the excavated deposits (most contexts produced two to four pieces per 100 sherds), there is almost no evidence for the manufacture of obsidian tools at Capilco or Cuexcomate (Sorensen 1988). However, the nearby site of El Ciruelo has a localized heavy concentration of blade production debris suggestive of workshop activity (Sorensen, Hirth, and Ferguson 1989), and it is likely that the artifacts at the excavated sites were manufactured at El Ciruelo. In contrast to the textile industry, obsidian production was specialized by settlement, although the volume of production at El Ciruelo and the intensity of labor (full-time versus part-time) cannot be assessed with current data.

Chert tool manufacture and bark paper production were minor craft industries at Capilco and Cuexcomate. Low-grade chert is present in the immediate vicinity of the sites, and most houses have some chert tools (generally between 0.5 and 1.0 artifact per 100 sherds). Tool production debris is present in many deposits, suggesting "household production" in Peacock's (1982) scheme (i.e., low-level domestic production for immediate household use). The manufacture of paper from the bark of the *amate* or wild fig tree is indicated by the presence of grooved rectangular basalt tools known as "bark beaters." Although these tools are rare, they occur in 70 percent of the houses with large excavated samples (i.e., >5 m^3 of excavated midden). Thus it appears that most houses engaged in low levels of paper production. Much of this production probably was for export, since the paper needs of these rural sites would have been low, and bark paper was among the tribute goods paid by western Morelos to the Aztec empire.

Finally, there is evidence for two unidentified types of craft activities. First, a number of copper-tin bronze awls and chisels were recovered in domestic middens. They are quite rare and lack a concentrated distribution pattern. We can only speculate that these tools were used for woodworking. Another rare category includes mineral paint pigments in three colors: red (hematite), yellow (limonite), and black (graphite). Among all of the rare artifact categories, these pigments show the highest degree of concentration. In the EC phase, four of the twelve pigment stones are associated with the elite compound, whereas in LC deposits 5 percent of the forty-three examples are from the elite patio group and 67 percent are from patio group 10 at Cuexcomate. The uses of the pigment are not known (body painting or manuscript painting are possibilities), but painting activities do appear to be concentrated in key patio groups.

INTENSIVE FARMING METHODS

Comparative data from the Late Postclassic Basin of Mexico and modern local ethnography suggest that four types of agriculture probably were employed in the vicinity of the excavated sites: rainfall agriculture, irrigation, terracing, and house gardens (Sanders, Parsons, and Santley 1979). Rainfall agriculture was the dominant method prior to the Late Postclassic period (Hirth in preparation). Probably by EC times, and certainly by the LC phase, the regional population exceeded the carrying capacity of rainfall cultivation in the area (M. E. Smith 1992:Chapter 10), leading to intensification in the form of terracing and possibly irrigation. Only very small plots could be irrigated, and this method made only a minor contribution to subsistence, if it was practiced at all.

Terracing was the dominant form of agriculture for the inhabitants of Capilco and Cuexcomate. Two types of terraces were built in the Cuauhnahuac phase: contour terraces on hill

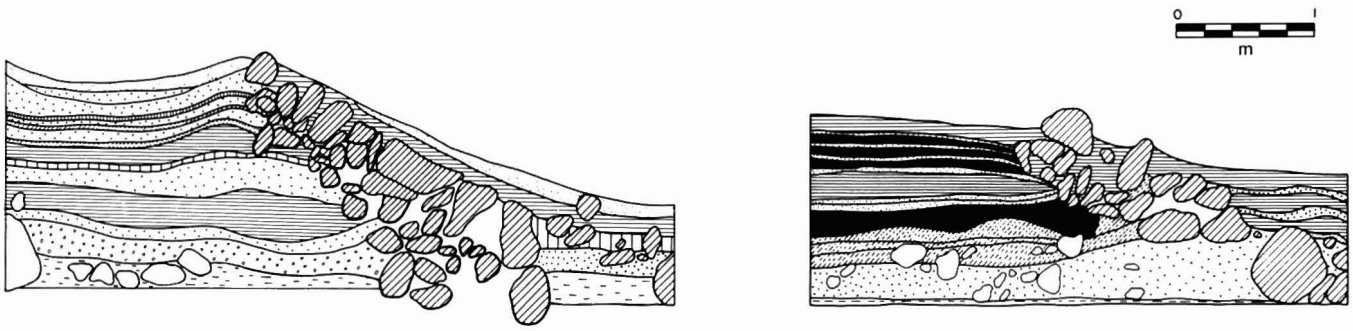

Fig. 68. Cross-channel terraces at Cuexcomate.

slopes and cross-channel terraces or check dams in small drainages (see Donkin 1979 on these types in general). The Postclassic Morelos Archaeological Project excavated a number of cross-channel terraces (M. E. Smith 1992: Chapter 10; M. E. Smith and Price in press), some of which are illustrated in Figure 68. The stone terrace walls were built up gradually. As eroding sediments filled in the area behind the terrace, the wall was built higher, and each incremental addition produced a larger planting surface with deeper soils. Capilco and Cuexcomate both have areas of cross-channel terracing adjacent to the settlement areas (Fig. 64). Contour terracing is far more extensive in the region than cross-channel terracing, but we were able to excavate only one small area of contour terraces, and their construction and use remain poorly understood. Although the slopes surrounding the eastern half of Cuexcomate are covered with contour terraces, none were located in the immediate vicinity of Capilco. The cultivation of house gardens within these settlements may be inferred from similar agricultural features elsewhere (e.g., Evans 1990), but positive evidence is lacking.

DIMENSIONS OF HETEROGENEITY

The three dimensions of heterogeneity discussed previously —ritual, craft production, and farming methods—provide evidence for different types of social complexity. The existence of three levels of ritual activity, each involving different kinds of artifacts and features, lends support to the notion that the hierarchical levels of settlement correspond to important social groups or categories.

The evidence for craft production shows the existence of economic differentiation, again at a variety of levels. All or most households were involved in the production of low levels of chert tools and perhaps wooden objects for domestic use, low levels of paper for exchange, and high levels of cotton textiles for both use and exchange. The only strong evidence for more intensive household craft production came from two houses dating to the LC phase (unit 102 at Capilco and unit 262 at Cuexcomate) that have frequencies of spinning artifacts more than two standard deviations above the mean for the phase (see Fig. 67). The use of paint stones appears to have been organized on a patio group level, since one patio group at Cuexcomate stands out above all others in each phase: patio group 6, the elite compound, in the EC phase, and patio group 10 in the LC phase. Finally, obsidian tool production was apparently specialized by settlement, with El Ciruelo probably providing most of the 12,000 pieces of obsidian recovered at Capilco and Cuexcomate.

Although the simple presence of intensive agricultural practices like terracing does not necessarily indicate social complexity, I consider these methods to be manifestations of complexity for several reasons. First, a number of different cultivation practices were in use, and this diversity is an example of complexity. Second, agricultural intensification makes significant demands on household labor, often leading to more complex forms of household organization and work scheduling (Maclachlan 1987). Third, agricultural intensification has a functional association with both high population density and complex social institutions (Turner 1983; Maclachlan 1987). The ratio of total terraced area at Cuexcomate to that at Capilco far exceeds the ratio of their populations, a fact that might signal that the expansion of terracing was not due to demographic growth alone. The elite at Cuexcomate may have promoted terracing for their own gain. If so, the distribution of terracing may be another signal of social complexity on a regional scale; further fieldwork is required to explore this notion more fully.

Inequality

ARCHITECTURAL MEASURES

Residential architecture provides a relatively direct measure of socioeconomic inequality in energetic and symbolic dimensions. Figure 69 contains reconstruction drawings of a typical nonelite house of adobe bricks and the EC elite compound (patio group 6). The elite compound clearly represents a much higher energetic investment than the nonelite house, implying a greater degree of control over labor (Abrams 1989). Symbolically, patio group 6 conveys a message about the power and status of its inhabitants: it is larger than normal patio groups; it is enclosed, unlike the open configuration of other groups; the rooms are built on top of raised platforms; and the compound is located on the public plaza at Cuexcomate, opposite the temple.

Energetic measures are more appropriate than symbolic factors for assessing the extent or degree of inequality because control over labor is a direct manifestation of elite power, and energetic inputs are easier to quantify. It is not yet possible to estimate the labor required to construct Postclassic houses, because comparative data on adobe house construction are lacking. As a substitute for labor estimates, I have calculated the total architectural volume of walls, foundations, and platforms at Cuexcomate and Capilco (assuming a constant wall height). Ground-level houses, the predominant type of nonelite residence, are small single-room structures with an aver-

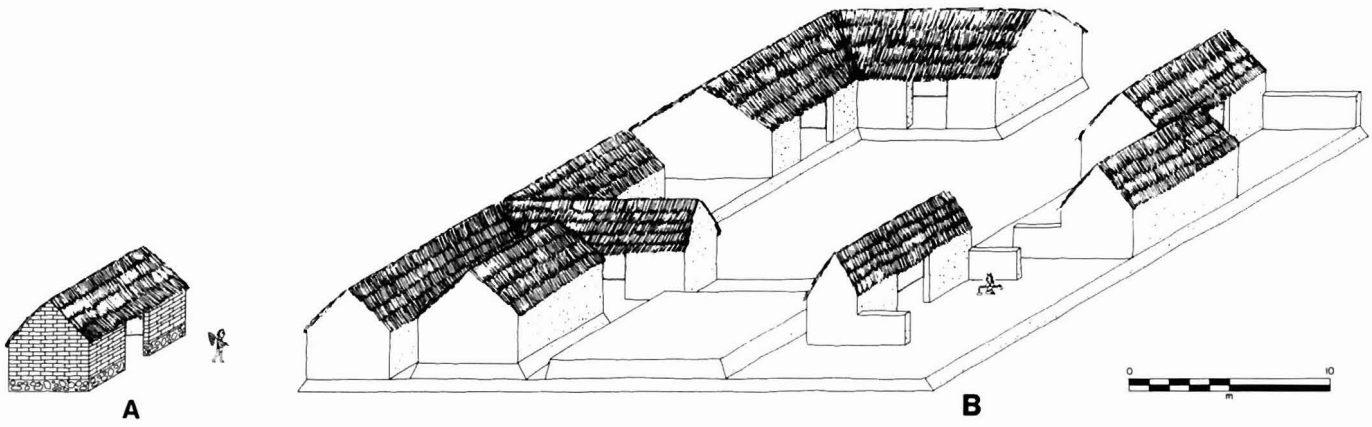

Fig. 69. The Early Cuauhnahuac elite compound at Cuexcomate (patio group 6) compared to a typical ground-level house.

age of 14 m^2 of interior area (in both phases), and they have a mean architectural volume of 24 m^3. A typical patio group of three houses therefore has a total volume of 72 m^3. The Cuexcomate EC elite compound pictured in Figure 69 has an architectural volume of 781 m^3, which is over ten times the mean figure for nonelite patio groups.

In the succeeding LC phase patio group 6 was abandoned, and its role was assumed by patio group 7, which is located on the north side of the public plaza (see Fig. 64). Although architectural, artifactual, and locational data all support the interpretation of patio group 7 as an elite compound, it is a far more modest group of structures than group 6. The total

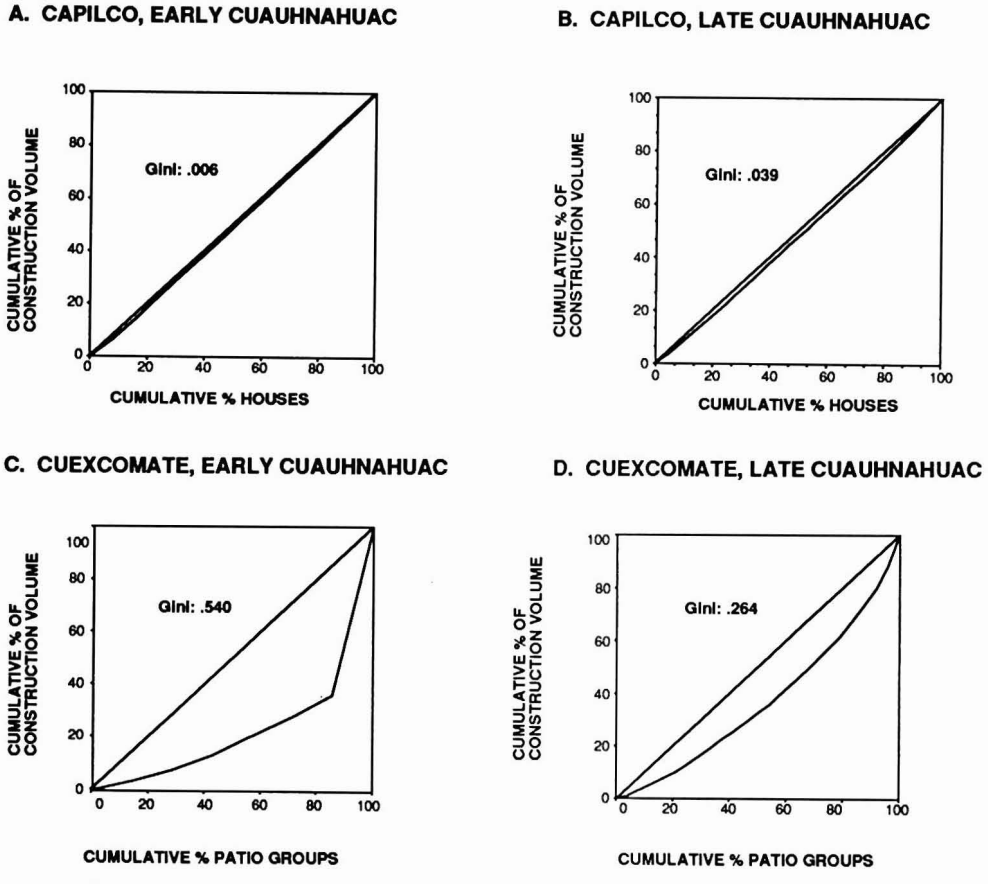

Fig. 70. Lorenz curves illustrating the degree of inequality by site and phase. Inequality is measured by the architectural volume of houses.

architectural volume of group 7, 277 m^3, is less than four times the nonelite mean.

The extent of inequality in architectural volume is illustrated by the Lorenz curves in Figure 70. These graphs portray the extent to which a finite good (architectural volume) is concentrated among a small segment of the population. A diagonal line indicates an even distribution in which all houses are the same size (i.e., no inequality), and uneven distributions are signaled by curves dropping below the diagonal; the lower the curve, the greater the inequality. The Gini index is an index of concentration, measuring the area between the diagonal and the curve (see Shryock, Siegel, and Stockwell 1976:98–100 on these measures). The data from Cuexcomate are plotted by patio group; the small size of Capilco necessitates calculations based on individual houses.

The Lorenz curves show that there is virtually no inequality in housing at Capilco in either phase (although there is some variation in architectural volume, from 18.9 m^3 to 29.1 m^3). Cuexcomate shows a moderately high degree of concentration in the EC phase, with a lower level of inequality in the LC phase. In other words, the site of Cuexcomate has clear evidence for inequality in residential architecture in both phases, with more extreme differentiation in the EC phase than in the LC phase.

ARTIFACTUAL MEASURES

After architecture, domestic artifacts are the next strongest archaeological indicator of household wealth (M. E. Smith 1987). The distributions of artifact categories among houses show that no single type of artifact has an exclusive association with the elite compounds in either phase. Even categories like jade beads, copper bells, and stone sculptures, which might be expected to show a positive association with elite residences, are found in equivalent amounts in all types of residences at both sites. However, a number of ceramic categories do show significant statistical associations with the elite compounds. In other words, there are no clear sumptuary goods (among the excavated artifacts) that were used exclusively by the elite, although some ceramic types are present in elite middens in consistently higher frequencies. This observation is confirmed by discriminant analysis, in which combinations of ceramic variables can distinguish effectively among three categories of residence (Capilco, Cuexcomate nonelite, and Cuexcomate elite) in each phase.

In order to examine the distribution of wealth among households, I have calculated wealth indices for the houses in each phase. The measure discussed here, called wealth index 1, is a phase-specific measure based upon the five ceramic categories most strongly associated with the elite compound in each phase (as determined by analyses of variance and comparisons of means). Three ceramic types are used for both phases: total bowls, Aztec III Black-on-Orange imports, and polished red bowls. The other two types are other decorated bowls and Morelos imports for EC, and Tlahuica polychrome bowls and incense burners for LC. For each house within each phase, the frequency for each of the five variables (expressed as a percentage of all ceramic vessels) is standardized (converted to a Z score), and the standardized values are summed to produce wealth index 1. This variable has a range of −8 to +6, with a mean of 0 for each phase.

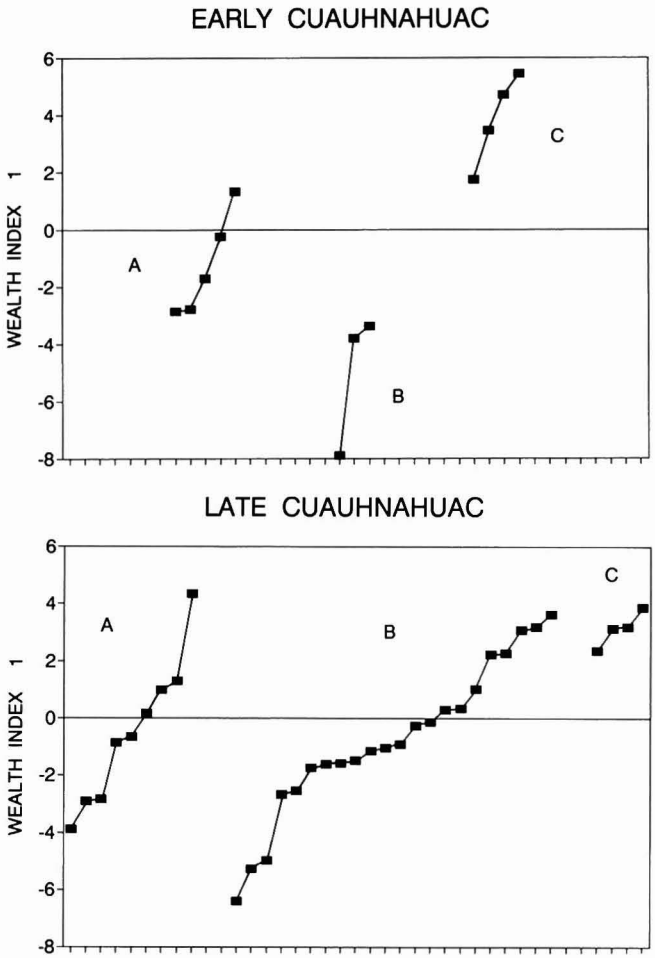

Fig. 71. Wealth variation as measured by wealth index 1, an index constructed from frequencies of wealth-sensitive ceramic categories. Each symbol represents one house. Houses are grouped into three categories: A, houses at Capilco; B, nonelite houses at Cuexcomate; C, elite houses at Cuexcomate.

Figure 71 shows the values of wealth index 1 for all excavated houses. These graphs illustrate two important findings. First, the elite residences (category C) are more easily distinguished from the nonelite houses in EC than in LC. This

pattern (also reflected in the analyses of variance and the discriminant analysis) parallels the architectural evidence discussed earlier. Second, there is a wide range of wealth values, particularly within the nonelite categories.

PATTERNS OF INEQUALITY

Three important patterns are revealed by these architectural and artifactual data on inequality. First, there is considerable variation in wealth in both the EC and LC phases. This is evident in the Lorenz curves for Cuexcomate (Fig. 70) and in the wealth index distributions for both sites (Fig. 71). This pattern includes not only elite-nonelite differences but also a high degree of wealth variation within the nonelite populations of both sites.

A second pattern is the decline in the magnitude of elite-nonelite differences from EC to LC times. Again, both the architectural and artifactual data show this trend (Figs. 70 and 71). The residents of the LC elite compound were far less differentiated from the rest of the population than were their EC antecedents.

A third important pattern is an apparent overall reduction in wealth levels, probably signaling a lowered standard of living in LC times. The data already discussed are relative measures describing architectural and artifactual patterns within each phase, and therefore they reflect absolute changes between phases only indirectly. The lowering of wealth is signaled by an independent measure, wealth index 2, a phase-independent measure calculated as the percentage of local decorated ceramics plus two times the percentage of imported ceramics. This index is less sensitive to wealth variation within phases, but it does permit comparisons between phases. The nonelite mean values decline from 51.4 in the Temazcalli phase to 43.2 in EC to 35.3 in LC. The elite means decline from 62.5 to 48.3 from EC to LC. This pattern is not apparent in the architectural data beyond the fact that the single largest and most costly residential group, patio group 6 at Cuexcomate, was abandoned in the LC phase. In other words, the nonelite population was living in similar kinds of houses in each phase, whereas the elite were living in far more modest quarters in the LC phase. However, the level of affluence as measured by wealth index 2 declines in all types of contexts, suggesting possible conditions of increasing poverty.

Connectivity

Interaction between rural Morelos populations and the outside world, as measured by material culture, was structured by two general processes: stylistic interaction and exchange.

STYLISTIC INTERACTION

Stylistic interaction refers to the process by which spatially separated populations produce material items that are stylistically similar because of contact or communication between the populations. At Capilco and Cuexcomate, high levels of stylistic interaction with other central Mexican Late Postclassic populations are evident in two realms: elite housing and ritual practices. Aztec palaces, as documented by ethnohistory and archaeology, conformed to a standard architectural pattern (Evans 1991). Many of the major characteristics (such as large size, many rooms that open onto an enclosed courtyard, and the elevation of rooms and structures on low platforms) are features of patio group 6 and, to a lesser extent, group 7 at Cuexcomate (M. E. Smith 1992). The location of these compounds on a public plaza is another standard feature of Late Postclassic palaces. These two patio groups conform to a geographically extensive pattern of elite architecture, indicating that the Cuexcomate elite participated in a widespread network of elite communication.

The material expressions of rituals at all levels also correspond to general central Mexican practices. The figurines and long-handled incense burners used in domestic ritual are nearly identical to Late Aztec artifacts excavated in the Basin of Mexico and depicted in the codices. The rock piles, if interpreted correctly, exemplify another widespread expression of ritual. Finally, the temple platform at Cuexcomate conforms to general Late Postclassic conventions in its stepped profile, the high quality of construction and materials, and its location on the east side of a public plaza.

Apart from elite architecture and ritual artifacts, most of the material remains at Capilco and Cuexcomate either are locally distinctive (e.g., nonelite housing, circular structures, ceramic decoration) or resemble other Late Postclassic items merely because of technological or utilitarian constraints (e.g., obsidian tools, food preparation items). In contrast, elite architecture and religious practices follow widespread cultural patterns whose manifestation in rural Morelos shows the participation of these populations in wider cultural or stylistic networks.

EXCHANGE

The evidence suggests that some domestic manufacture of cotton textiles and bark paper was destined for export, since output would have exceeded the modest demands of rural consumption. Grains or other foodstuffs grown in the extensive terraced fields also may have been exported. All three of these items appear as tribute goods from western Morelos in

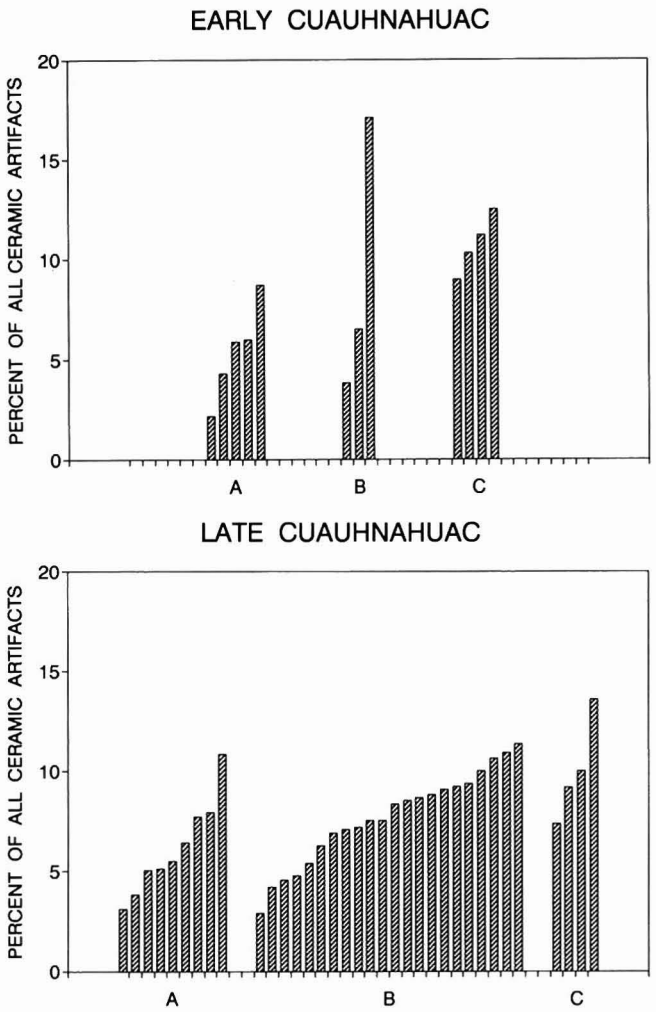

Fig. 72. Frequencies of ceramics imported from the Basin of Mexico. Each bar represents one house. Houses are grouped into three categories: A, houses at Capilco; B, nonelite houses at Cuexcomate; C, elite houses at Cuexcomate.

the Aztec imperial tribute lists (Codex Mendoza 1992:23r–23v), and the importance of cotton textiles in both tribute networks and marketplace exchange (Berdan 1987) suggests that goods produced at rural sites may have moved through a variety of distribution channels.

Imported goods recovered in the excavations may be classified in three categories according to probable place of origin: those from Morelos, the Basin of Mexico, and other areas. The only likely imports from other parts of Morelos are Tlahuica polychrome ceramics from the Cuernavaca area (pertaining to the Teopanzolco ceramic complex), the Yautepec region, and eastern Morelos (in descending order of abundance). These are quite abundant in the two Temazcalli-phase deposits (8.6 percent of all ceramics). The frequency drops off somewhat in EC, when they are most common in elite contexts at Cuexcomate (3.0 percent) and at Capilco (3.1 percent), while very rare in nonelite houses at Cuexcomate (0.3 percent). The present inability to distinguish the LC polychrome ceramics of the study area from those of the Cuernavaca area (Tecpan phase) makes it difficult to evaluate regional ceramic exchange at that time.

The modest frequency of ceramics imported from the Basin of Mexico (primarily Aztec Black-on-Orange and Texcoco Fabric Marked) in Temazcalli times (3.0 percent) jumps to 7.3 percent and 7.2 percent in the EC and LC phases, respectively. All excavated refuse deposits have examples of these imports (household frequencies are shown in Fig. 72). Thus, whereas elite contexts have slightly more Basin of Mexico imports than nonelite contexts, these ceramics certainly are not limited to the elite. Obsidian imported from the Basin of Mexico also is abundant and ubiquitous, although there is no elite association in the obsidian-to-ceramic ratios. The ceramic and obsidian data together demonstrate an overall high frequency of exchange with populations in the Basin of Mexico and the widespread access of households to exchange networks. The former conclusion accords well with data from other parts of Mesoamerica and indicates a high volume of exchange in ceramics and obsidian from the Basin of Mexico in Late Postclassic times (M. E. Smith 1990). Imports from other areas, including ceramics, jade, and copper, are not abundant.

Discussion

RURAL SOCIETY IN THE CUAUHNAHUAC PHASE

The excavations of domestic contexts at Capilco and Cuexcomate point to a densely settled, socially complex, and economically active population in rural western Morelos during the EC and LC phases. Population density was quite high, not only within settlements (see Table 22), but also on a regional scale. An area of 6 km^2 around the excavated sites had population densities of 80, 280, and 670 persons/km^2 for the Temazcalli, EC, and LC phases, respectively. Even though this zone does not include nearby uninhabitable mountains that would reduce densities, the figures are high, and this situation appears to characterize many parts of Western Morelos in Cuauhnahuac times. Regional population was growing in these phases, and this growth was accompanied by agricultural intensification in the form of contour and cross-channel terracing.

The expansion of terracing may not have kept up with the rapidly growing rural population, leading to lowered standards of living and general conditions of poverty in the study area, as suggested by the decline in wealth index 2. In cross-cultural perspective, growing rural population, land shortages, and

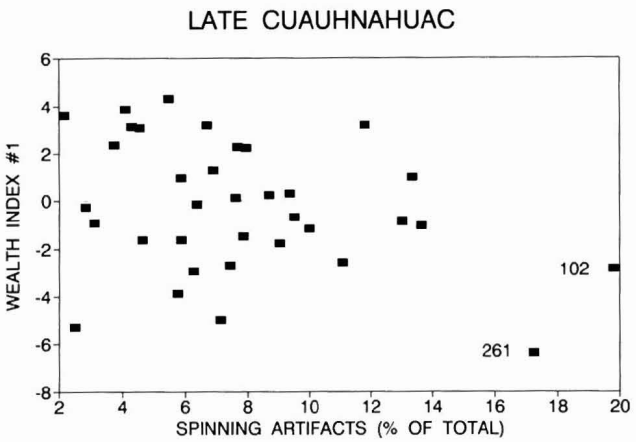

Fig. 73. Plot of wealth index 1 against the frequency of cotton spinning artifacts.

poverty often lead to increased peasant craft production as rural households try to supplement their dwindling agricultural income with cottage industries (Thirsk 1961; Miller and Hatcher 1978; Arnold 1985:171–196). The increased frequency of cotton spinning artifacts through the three phases, coupled with a decrease in wealth index 2, agrees with this interpretation, but does not necessitate it, since increasing tribute demands could also generate this pattern. Nonetheless, the house-to-house distribution of spinning artifacts does support the poverty–cottage industry model. In the EC phase, no single house stands out with excessive frequencies of spinning artifacts, whereas in LC times one nonelite house at each site exceeds the mean value by more than two standard deviations. When the LC data are plotted against wealth level (Fig. 73), it can be seen that both houses with high textile frequencies have low wealth values. Spinning artifacts make up 20 percent and 17 percent, respectively, of the total ceramic inventories of houses 102 at Capilco and 261 at Cuexcomate, suggesting that the inhabitants of these structures may have been specializing in textile manufacture, perhaps to compensate for economic hard times.

The cotton textiles and bark paper that were produced for export at Capilco and Cuexcomate could have moved through the tribute system or marketplace channels. Imperial tribute demands were relatively modest when figured on a per capita basis (M. E. Smith in press). Therefore, many of these manufactured goods probably were traded through market exchange. Ethnohistoric data indicate that many settlements in Morelos the size of Cuexcomate or smaller had regular markets (M. E. Smith in press), and Goodfellow's (1990) study of Cuauhnahuac-phase ceramic petrography points to active regional market exchange of ceramics in western Morelos. In addition, the high volume of ceramic and obsidian exchange supports the notion that these sites were well integrated into central Mexican exchange systems (M. E. Smith 1990).

Architectural, artifactual, and locational data show that elite groups were resident at Cuexcomate in both the EC and LC phases. Whereas the proximity of the elite compounds to the temple platform suggests that the elite played a role in public ritual, we found little evidence of an economic role for the elite. They clearly did not monopolize or strongly control exchange activities, and there is no evidence for elite involvement in craft production beyond the normal domestic production that all households carried out. It is possible that the elite played an economic role by sponsoring or promoting agricultural expansion and intensification, as documented in other agrarian states (e.g., Polgar 1975; Gilman 1981), but existing data do not permit this notion to be evaluated. The census documents from Morelos suggest that nobles controlled most of the farmland and played important political roles as leaders and tribute collectors.

In summary, the Cuexcomate elite appear to have had important social functions in the realms of politics, religion, and perhaps agriculture, with only minimal direct involvement in the control or management of exchange or craft production. Cross-culturally, rural elites often are present in regions with extensive marketplace trade and highly commercialized interlocking market systems (C. A. Smith 1976). This description fits the evidence for Cuauhnahuac-phase Morelos.

CAPILCO, CUEXCOMATE, AND RURAL COMPLEXITY

The study area of the Postclassic Morelos Archaeological Project was characterized initially as a rural area because it is not close to any of the ethnohistorically identified city-state capitals of Morelos. The results presented in this chapter clearly document several dimensions of social complexity at Capilco and Cuexcomate, leading to the general conclusion that rural complexity existed in this area. However, by applying the functional approach to urbanism (Blanton 1976), it is possible to classify Cuexcomate as a low-level urban center or town (as suggested in M. E. Smith 1989). Since Cuexcomate is more complex than Capilco, does this mean that Cuauhnahuac-phase complexity is really an urban phenomenon after all, with small rural sites that were homogeneous settlements of simple peasants? The evidence indicates that this would not be an accurate description of the situation.

Table 23 presents a subjective summary of the archaeological evidence for social complexity at Capilco and Cuexcomate. Although Cuexcomate was the larger settlement, Capilco had a higher population density. Some measures of

Table 23. Comparisons between Capilco and Cuexcomate

Attribute	Capilco	Cuexcomate
Function and size		
Functional classification	Village	Town
LC population	120	800
LC population density (persons/ha)	100	55
Maximal settlement level	Cluster	Macrocluster
Intensive agriculture		
Contour terraces	No	Yes
Check-dams	Yes	Yes
Craft production levels		
Textiles	High	High
Paper	Moderate	Moderate
Paints	Low	Moderate
Presence of textile specialists	Yes	Yes
Levels of ritual		
Domestic	Yes	Yes
Patio group	No	Yes
Public	No	Yes
Inequality		
Elite residence	No	Yes
Nonelite wealth variability	Yes	Yes
Connectivity		
Elite and religious stylistic interaction	No	Yes
Widespread access to trade goods	Yes	Yes

heterogeneity indicate greater complexity at Cuexcomate (more agricultural terraces per capita, possible specialized use of paints, and, especially, more religious complexity), whereas most indicators of craft production are the same at the two settlements. Probably the greatest social distinction between the settlements (apart from size) is the presence of an elite at Cuexcomate, but not at Capilco. The third dimension of complexity, connectivity, shows greater complexity at Cuexcomate in terms of elite and religious stylistic interaction, but no greater access to trade goods among the elite.

In summary, Cuexcomate manifests far more evidence of social complexity than Capilco, although the smaller site exhibits an equivalent level of economic complexity and variability in nonelite wealth levels. Thus, even if Cuexcomate is categorized as a small urban settlement, it does not monopolize the manifestations of social complexity in this area. Irrespective of how one characterizes that site, I believe it is still useful to call this area a rural zone (relative to the major cities of Cuauhnahuac-phase Morelos), and, as such, the excavations at Capilco and Cuexcomate provide evidence for rural social complexity in Late Postclassic central Mexico. The other studies in this volume reach similar conclusions for other societies in ancient Mesoamerica and the Near East. Clearly, rural complexity must be added to our repertoire of archaeologically useful social concepts.

Notes

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1. McGuire's third component of heterogeneity, the degree of independence between social parameters, is difficult to address with archaeological data, and his archaeological example, the ratio of residential to nonresidential built space (McGuire 1983:127), appears to be associated only indirectly with this factor.

2. All quantitative data on artifact distributions in this chapter describe materials from well-phased domestic midden deposits associated with individual houses. Ceramic artifacts are quantified in terms of minimum numbers of vessels per type per context (based upon rim sherds), expressed as percentages for each context. These measures are discussed in M. E. Smith (1992).

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