ARCHAEOLOGICAL SURVEY IN THE MIXTEC SIERRA

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In 1990 Steve Kowalewski and I, with a crew of six to eight other archaeologists, carried out a regional survey in the rugged Mixtec Sierra in Oaxaca, Mexico (Figure 1). For five months we climbed up, down, and along mountain ridges and walked steep-sided, narrow river valleys looking for pre-Columbian settlements and recording information about what we found. People have asked why we would survey mountains, both while Steve and I were preparing this exciting but daunting project, and since we completed the field work. The answer lies in the development of our thinking during and after earlier surveys in the Valley of Oaxaca. Our goal then had been to understand long-term change in the ancient urban society of the Valley, and to shed light on the development of complex societies, or civilizations, as they are often called.

BACKGROUND

The Mixtec Sierra forms the western border of the Valley of Oaxaca in southern Mesoamerica (Figure 2). Monte Albán, center (or capitol) of the largest Oaxacan state, lies jewel-like atop a hill four hundred meters above the valley floor. The pale stone buildings of its Main Plaza, the downtown core, glisten in the brilliant sun of highland Mexico. From the tallest building, probably a temple pyramid unimaginatively (but accurately) named the “South Platform,” the vistas are panoramic. North lies the Main Plaza, an area equivalent to three football fields levelled out of a rocky hilltop, and defined by temples, palaces, stairways, a massive columned portico, and a ballcourt, all of carefully hewn rock. Carved stone monuments, embedded in the walls of buildings, or freestanding, tell stories that remain largely undeciphered. What tales do they tell? Why was a city built in such an out-of-the-way spot? How far did the rule of its aristocracy reach? How did the system, the political, economic, and social networks of which Monte Albán was a part, change over the city’s 1,200 year history? Most ancient cities were parts of complex societies with states. Monte Albán was first settled in about 500 B.C., a thousand years after the first agricultural villages appeared in the Valley of Oaxaca. After A.D. 700, eight hundred years before the Spanish conquest, its magnificent Main Plaza was allowed to fall into ruin as buildings were no longer maintained and new construction ceased. Why did cities arise at all in the Valley of Oaxaca, or anywhere in Mesoamerica? Why did Monte Albán decline more than a millennium later?

Prior to the 1960s, specialists in ancient complex societies every-
Figure 1  Aerial View of the Mixtec Sierra
where tended to focus on the relationships between major cities in
different regions to answer questions about their rise and fall, the
emergence of social stratification (social classes), and other social
processes. These links were generally seen in terms of trade over
distances of hundreds or thousands of kilometers, in objects crafted
from rare, exotic materials such as jade, magnetite, or the best made
and most elaborate pottery. Other explanations focused on coloniz-
ing migrations from distant, already developed areas. Monte
Albán’s rise was attributed to influence from (through the mecha-
nism of trade in exotics) or migrations by other Mesoamerican peo-
bles—the Maya, according to some early scholars (although it soon
became clear that Maya cities were actually younger than Monte
Albán), or the Olmec on the Gulf of Mexico coast. Dissatisfied with
answers that seemed only to shuffle the question off to another
locale and that were unable to tell us just how trade in rare materials
resulted in social transformations, many scholars in the 1960s and
1970s adopted a regional approach that focused on the larger
regional societies of which ancient cities were a part. This strategy
recognized that urban centers were parts of networks of communi-
ties, ranging from hamlets of a few families to cities rivaling the
“center” in population size. The communities of these networks
were linked in complex, changing relationships of political control
(e.g., taxation, warfare), specialized economic production (including
agricultural production), trade and exchange, and social ties, espe-
cially among the families of different local elites (or aristocracies). A
regional approach takes a broader perspective, looking not just at a
specific urban center but at change over time in the system of differ-
ent communities of which a particular city was a part.

Seen from atop the lofty South Platform at Monte Albán, beyond
the ancient city’s terraced slopes where its thousands of residents
lived, the Valley of Oaxaca stretches north, south, and east in three
broad “arms,” carved like a massive sunken oasis in the seemingly
infinite mountain ranges of the highlands. Although only a small
part of the modern state, the Valley is its only considerable expanse
of flat land, so it is not surprising that it has the highest density of
people in the southern highlands. Scores of modern villages and
towns dot the landscape. On the virtually frost-free alluvium and
gentle foothills, farmers grow corn, beans, and squash much as their
pre-Columbian ancestors did, although ox-drawn ploughs and the
occasional tractor are clear post-conquest additions. Even in the rela-
tive haven of the Valley, though, periodic drought in this semi-arid
climate means that farming is, and always has been, a risky business
except where permanent streams and other rare, year-round water sources can be tapped for irrigation. Still, the Valley has been a magnet attracting people, providing a relatively benign setting for agricultural societies to flourish, for more than 5000 years.

In 1977, I joined a long-term project whose goal was to undertake a regional study by carrying out a large-scale archaeological survey of the Valley of Oaxaca. Richard Blanton had already conducted an intensive study at Monte Albán. Excavations between 1931 and 1958, mostly under the direction of Alfonso Caso, had produced the reconstruction of the Main Plaza visible to visitors today, a host of artifacts housed in museums in both Oaxaca and Mexico City, and a solid history of the construction and development of Monte Albán’s Main Plaza between about 500 B.C. and A.D. 700. Before Rich Blanton’s research, no one knew how large the ancient city was, how many people lived there at different times throughout its history, or what sorts of economic activities the commoner population had engaged in.

The surveys in which I participated continued this work, locating and recording all visible pre-Columbian sites in the Valley of Oaxaca. We walked every field, hilltop, ridge, and modern town street, mapping and describing archaeological remains wherever we found them, and collecting pottery for closer study in the field lab. When the field work was completed in 1980, we had surveyed 2,150 square kilometers (830 square miles) and located and collected information from about 2,700 pre-Columbian sites.

We learned a great deal. Over eleven phases covering 3,000 years of settled life before the Spanish conquest, the population of the whole Valley of Oaxaca waxed and waned several times. Dramatic changes in the settlement hierarchy reflect shifting political, administrative, and economic arrangements. The population’s distribution across the landscape changed, too. At times, large numbers of new settlements were founded and older communities thrived in parts of the Valley, while elsewhere old towns were abandoned or shrank dramatically. Over time the areas of growth and decline changed. Potential agricultural production was not the only factor, often not even a significant factor, determining where settlements were established and whether their populations grew or dwindled. Clearly, during all pre-Hispanic time periods some communities were dependent on the productivity of others for their very survival, especially during the frequent drought years. Complex networks involving productive specialization, trade, and tribute (a form of taxation) integrated towns and villages, although these links were
not static. Changes in the distribution and sizes of settlements also point to the dynamic nature of the regional society’s boundaries. During some phases many sites, some of considerable size, were located on high hills on the Valley’s perimeter. In others, few settlements were situated on the Valley’s edges, while in yet others, the distribution of sites is continuous across the Valley floor and into the hills, suggesting that the system of settlement extended beyond the border of the Valley of Oaxaca, beyond the limits of our survey.

Regional archaeological surveys, like ours in the Valley of Oaxaca, have led to a new understanding of the complex, dynamic relationships between population growth, the development of site hierarchies, and the mechanisms integrating cities, towns, and villages in a regional society. But as is true with most research, our efforts led us to formulate new questions—ones that, in a sense, were unthinkable before this earlier work. How did interactions, not limited to long-distance trade, among the regional states of the ancient Mesoamerican world (or macroregion) contribute to long-term change in their structure and operation? What roles did boundaries and frontiers play, as some ancient societies expanded their territories at the expense of others? Were the vast, mountainous peripheries merely inconvenient, largely vacant places to be traversed while journeying from one highland valley to another? New questions demand renewed efforts and new strategies.

THE GOALS OF ARCHAEOLOGICAL SURVEY IN THE MIXTEC MOUNTAINS

From atop the South Platform at Monte Albán’s Main Plaza, beyond the Valley floor, the piedmont rises gently at first, then more abruptly, to craggy, pine-covered mountain peaks towering 3,000 meters (9,750 feet) above sea level. The mountains seem distant but ever present, always a part of one’s consciousness when in the Valley of Oaxaca. Mountains are visible in most directions from nearly everywhere. Leaving the Valley by highway, whether north, south, or east, means a torturous, seemingly interminable drive along tight, hairpin curves at dizzying elevations, underscoring the Valley’s physical isolation despite modern land transportation technology. The 100–120 kilometer (60–70 mile) trip to either coast
takes 8 to 10 hours, unless a landslide or washed out road segment slows you down.

Looking west from the South Platform is the Mixtec Sierra. About thirty-five kilometers (twenty miles) beyond as the crow flies is the Mixteca Alta, a series of small, interconnected highland valleys. The easternmost is the Nochixtlán Valley. Devastating erosion since the Spanish conquest, due in part to the introduction of grazing animals (especially sheep and goats), has made it one of the most impoverished parts of modern Mexico. But in pre-Columbian times cities, towns, and villages abounded, and kings of the Mixteca in the centuries before conquest recorded their family histories and military exploits in brilliantly painted books.18 Several valleys of the Mixteca Alta, as well as areas in the central highlands of Mexico, have been surveyed.19 Our survey connects these surveys with those in the Valley of Oaxaca to produce a massive block of well-studied territory. This is key to establishing a systematic body of comparable information about settlement hierarchies, demography and other aspects of a Mesoamerican macroregion of different ancient societies.

The Mixtec Sierra is ideal for studying boundaries and frontier zones. Today the native language spoken in virtually all of the Mixteca Alta is Mixtec, while in the Valley of Oaxaca, Zapotec is the language of most native speakers.20 The ancient Zapotec and Mixtec cultures, while sharing many features, had distinctive characteristics at the time of the Spanish conquest. The Zapotec-Mixtec linguistic and cultural boundary fell within the Mixtec Sierra during much of the pre-Columbian era. Ancient states in either adjacent valley, expanding their territories or endeavoring to maintain control over lands (and people) already ruled, would have had an interest in the Sierra’s fortifiable ridgetops and important transportation routes. Traders, diplomats, soldiers, pilgrims, and tlamemes, or human beasts of burden, travelled ancient roadways in the mountains linking the Valley of Oaxaca to the Mixteca Alta and to more distant parts of Mesoamerica. Prior to the Spanish conquest, there were no horses, oxen, cattle, donkeys, or other beasts of burden in Mesoamerica. Except where canoe traffic was possible (generally limited to the shallow lakes of the Basin of Mexico, the coastlines, and the broad rivers of the southern Maya lowlands), all travel and transportation was by foot.

The mountainous regions of Mexico are marginal today, but may have been less so before the advent of modern methods of transportation and cultivation. The times needed to traverse moun-
tainous versus flatter terrain on foot probably differ less than they do travelling by car. A more important difference may be long-term instability because of steep slopes that are more easily eroded. More abundant resources include orchard fruits, wood for charcoal and construction beams, and plentiful deer and other game.

Virtually all archaeological research in highland Mesoamerica has focused on major sites or highland valleys. Peripheral societies in environmentally marginal areas have been largely neglected. How did the complex interrelationships between the state societies of highland valleys and their poorer neighbors in the mountains affect each other’s development? Did peripheral societies develop only in response to pressures from their larger, more powerful neighbors, or did they have an internal dynamic that also led to change?

**Surveying Mountains**

To answer these questions, Steve and I decided to carry out a large-scale survey in an area of about 1,200 square kilometers (465 square miles) in the Mixtec Sierra, to link the previously surveyed Valleys of Oaxaca and Nochixtlán (in the Mixteca Alta), to begin building a macroregional data set for the central and south Mexican highlands, and to cover the crucial boundary zone between these areas. We modified the survey techniques we had employed in the Valley of Oaxaca for use in the mountains to produce information as comparable as possible. This was essential for constructing a systematic macroregional data set. Following the logic that had led to the large-scale survey of the Valley of Oaxaca in the first place, we also decided that systematic coverage (i.e., coverage intended to recover as near 100 percent of sites as humanly possible) was crucial. Because a major interest was change in the integration of communities in the periphery, we had to find as many of the settlements that had been parts of the network as possible in order to understand it. Our goals in the field were to locate, map, describe, and collect artifacts at every visible pre-Columbian site.

In the relatively flat Valley of Oaxaca, we had surveyed by fanning out in crews of three or four to survey land one aerial photo-
graph at a time until the entire Valley was covered and all sites had been recorded. In the mountains, such a strategy would have been an absurd waste of time, and physically next to impossible. We assumed that in the past people did not live in places that today are too steep to stand on, and concentrated our efforts on the crests of ridges and the gentler slopes leading to them and, at first, on the river valleys between ridges. Pairs of surveyors seemed more practical for the terrain and the smaller, less numerous sites we anticipated finding. Pairs would afford a measure of safety in the event of a sprained ankle or other unforeseeable misfortune, while ensuring that there were enough hands to map, write notes, and collect artifacts when sites were encountered.

DEALING WITH THE UNEXPECTED:
MODIFYING METHODS TO ACHIEVE GOALS

A truism of virtually all research is that, despite the best planning, things never work out exactly as you expect them to. Unforeseen problems emerged within days of starting in the field. First was a series of problems related to accessibility. The round trip from Oaxaca City where we lived and had set up a field lab was four to five hours, a good-sized chunk of the work day. Not much surveying can happen when crews spend half the day getting to and from work. Because many of the roads into the mountain towns follow river courses (and most modern towns are located low, near rivers, rather than up on the ridges), it took an additional hour or two to climb to the ridgetops from the town and another hour or two to get down. We were just getting to the high places where we needed to start surveying when it was time to turn around and go back. The second problem arose from more interesting circumstances. In the area where we began to work, on the heights above the modern town of Santa María Peñoles, all the ridgetops were littered with the remnants of ancient settlements. Peñoles is mentioned in sixteenth-century documents so we were not surprised to find a site there. We were unprepared, though, for the possibility that every ridgetop in our survey area would have artifacts to be collected and architecture to be mapped. The objective of a survey is to find sites, of course, but
sites slow down the work, making it much more difficult to cover large areas. It also became apparent that, because many ridgetops had never been disturbed by ploughing, much more architecture had survived to be mapped than was usually the case at sites in the Valley of Oaxaca, where centuries of ploughing have obliterated all but traces of anything less substantial than mounds.

We decided to change the way we were doing things to see if we could work more efficiently without wasting most of our precious time in travel. We packed sleeping and cooking gear and food and water for four days, and we hired men with burros to haul it up to a suitable place where we could camp at night. From there we could access ridgelines for several days of surveying without having to come down a thousand meters or so every night. This proved to be remarkably efficient since we could begin surveying early in the morning and work far later in the day. (But not everyone liked the suppers of tuna soup made with burro-ripened vegetables.)

Having resolved our logistical problems, we began to survey other parts of the study area, away from Peñoles, to determine whether the extremely high density of sites there was the pattern for the whole projected survey area, or if site densities were more variable (and lower elsewhere). The alternative was to reduce our intended study area size, but we were extremely reluctant to do this until it was proven absolutely necessary. Achieving our goals depended on collecting systematic data from a large area. Our initial forays into areas distant from Peñoles were promising. We found sites, but the density was indeed variable. With this knowledge, we were confident that a large-scale survey was achievable.

The final change in our field methods was the decision to sharply limit our efforts in the river valleys. During the first weeks of the project, we combed the banks of two major rivers and the lower portions of several tributaries. Not only did we not find any trace of significant sites, it was apparent that we were unlikely to. Flat areas are extremely limited along the rivers of the Mixtec Sierra so large settlements are highly improbable in these lower locations, and fast-moving water during the rainy season scours the river banks, obliterating any archaeological remains that may have existed. As our understanding of the mountain zone improved we realized that, in contrast to the flat Valleys of Oaxaca and Nochixtlán where hills are seen as impediments to travel and communication, in the Sierra the mountain ridges form the basis of most physical integration. On foot, it is far easier to follow ridgelines since this means a single major ascent and/or descent (800-1,000 meters [2,500-3,250
feet] in elevation only), and it minimizes the need to skip back and forth across water courses. Eliminating river valleys from the survey made sense because of the improbability of finding ancient settlements, and because of our understanding of the favored locations for pre-Hispanic settlements.

In five months, we surveyed 1,000 square kilometers (385 square miles), mapping more than 500 sites over a broad region linking the Valley of Oaxaca and Nochixtlán Valley surveys.

**Pre-Hispanic Settlement in the Mixtec Sierra**

The number of sites in the Mixtec Sierra was a surprise (Figure 3). Site densities in the Valley of Oaxaca, where on average a site is located in every square kilometer, are only about twice as great. While none of the Mixtec Sierra settlements is as big as the largest ones in the Valley of Oaxaca or the Nochixtlán Valley, several dozen are considerable in size, strung along the crests of ridges for several kilometers. Each would have housed several thousand people.

Parts of the Mixtec Sierra apparently were never inhabited, other areas were occupied only during part of the pre-Hispanic era, and still others were the scene of continuous although perhaps interrupted settlement for as long as 2,300 years. Physically, the survey area consists of two parts, defined by the divide separating the river drainages of the Valley of Oaxaca from those in the Mixteca Alta. The smaller part, east of the divide and overlooking the Valley of Oaxaca, has fewer sites and was probably part of the Valley of Oaxaca regional system. West of the divide, sites number in the hundreds and are found nearly everywhere. Many are large with abundant and complex architecture. The divide itself, a long ridge 2,600–3,000 meters (8,500–9,750 feet) above sea level, had very few traces of ancient settlement.

Like most regional settlement patterns studies, our survey in the Mixtec Sierra dated sites using ceramic styles of known age in the Valley of Oaxaca or in the Nochixtlán Valley. As we walked over sites, measuring and mapping architectural features, we carefully combed the ground surface looking for pottery vessel fragments that would be useful for dating, as well as other artifacts. Wherever possible, the age of ceramics was recorded for each architectural feature.
Figure 3
Distribution of Late Pre-Columbian Sites
in the Mixtec Sierra Survey Area
Collections of sherds from most sites were taken back to the field lab for closer inspection. Generally though, pottery was rarer on the surface at mountain sites than is true for most Valley settlements because there was less disturbance from ploughing or other recent activities. Thus the conditions that promote excellent architectural preservation are a double-edged sword, making it more difficult to date sites. Highly decorated vessels, which are the most chronologically sensitive markers, also tended to be less abundant. As a result, our chronological placement of many mountain sites is limited to assignment to the broad Mesoamerican periods (Archaic or Preclassic (9000–2000 B.C.), Formative (1500 B.C.–A.D. 300), Classic (A.D. 300–900), and Postclassic (A.D. 900–1521).

Early Settlement

Our survey located a half-dozen probable Archaic period sites, all closer to the Mixteca Alta than the Valley of Oaxaca. One, situated at an outcropping of chert, was a quarry site where raw material for stone tool manufacture was collected and processed.

A few mountain sites have traces of occupation in the Middle Formative period (after 800 B.C.), seen in pottery very similar in style and manufacture to vessels of this age from Monte Albán and other Valley of Oaxaca sites. All of these sites have much larger, later occupations. The few Middle Formative pottery sherds make it impossible to know just how large these early occupations were, or whether any of the presently visible architecture dates to this time. These early settlements are concentrated most heavily in the southern part of the survey area.

By the Late Formative period (ca. 300 B.C.–A.D. 200), the number of settlements had increased substantially and sites may have been larger, although ceramic markers are still very few in number. Diagnostic pottery is identical to contemporary Valley of Oaxaca styles; some vessels probably were imported while others were local imitations. The regional distribution of Late Formative sites reveals two processes. First is the continued growth and development of settlements in the southern part of the survey area. Pottery types suggest that these sites were neither outlying mountainous areas of the Monte Albán state nor founded by directed emigration from the Valley of Oaxaca. Although links with the Valley of Oaxaca are clear, these southern settlements retained a degree of independence from Valley of Oaxaca influences.
Second is establishment of a string or corridor of sites along the continental divide, reflecting Monte Albán’s concern with controlling routes of access to and from the Valley of Oaxaca. Pottery at these corridor sites is virtually identical to that found at contemporary Valley of Oaxaca sites. The continental divide was one of several strategic transportation corridors controlled by Monte Albán rather than the rival cities of the Mixteca Alta in the Late Formative. The corridor sites all were abandoned at the end of this period.

The Classic Period (ca. A.D. 300–800)

In the Classic Period, settlement was intensified—there are more sites, and large sites as well as small ones—and site distributions changed. New architectural forms appeared. We can better associate architecture with occupations in later time periods because more recent buildings were modified less by subsequent occupations. But clearly, major construction projects were undertaken at many sites that continued to be occupied from Late Formative times as well as at sites that were first settled during the Classic period.

Many sites occupied in the Late Formative in the southern Mixtec Sierra continued and grew in the Classic period. Other large ones arose anew, especially on the ridges in the center of the survey area. Strings of smaller sites, generally less architecturally complex and impressive, are located on the ridgetops at the western boundary of our survey area and on hilltops well into the northwest. Except for a vacant area at the divide, Classic period occupation in the Mixtec Sierra is continuous with the Valley of Oaxaca settlement.

Strong connections to Monte Albán are apparent in the pottery, which is often identical in style to ceramics at contemporary Valley of Oaxaca sites, although much of it clearly was made locally rather than imported. The distinctive vessel styles of the Nochixtlán Valley are rare, indicating weaker links to the west. Formal mound groups similar to those at Valley of Oaxaca Classic period administrative centers also point to strong ties to the east. While architecture cannot be dated definitively without excavation at sites where more than one period is present, pottery associations suggest a Classic period date for many formal building complexes.

More than twenty sites extend a kilometer or more along the ridgetops. Excellent architectural preservation at many of these
sites permits an unparalleled glimpse of their physical layouts, which both reflected and actively formed internal social and other divisions. Larger towns had over a hundred residential terraces carved into the upper slopes of ridges, massive encircling walls, gateways, large platforms, stairways, temples, tombs, and elaborate strings of patio groups. Smaller sites had fewer architectural features but still boasted dozens of terraces, mounds and plazas, patio groups, and often gateways or other wall features to control access.

Site distributions, the predominance of Valley of Oaxaca-style pottery, and formal mound groups like those from Valley administrative centers at larger mountain sites all point to close links to the Monte Albán state. Were Mixtec Sierra settlements mere outposts populated by immigrants from among Monte Albán’s faithful subjects? Continuity from Late Formative occupations, at least in the south, suggests more complex processes at work. Monte Albán’s boundary concerns may be reflected in new Classic settlements, including fortified ones near the western limit of its territory and others controlling the mountainous frontier. But clearly these towns were not founded in an uninhabited wilderness. How the pre-existing society both affected and was affected by Valley of Oaxaca state interests in the Mixtec Sierra is an important question for which we do not yet have ready answers. However it is apparent that in the Classic period Monte Albán, not the smaller states of the Mixteca Alta, held dominion over the mountainous domain between the highland valleys. Our survey area did not extend far enough west to escape the grasp of Monte Albán’s power.

The Postclassic Period (ca. A.D. 800–1521)

By the Postclassic period, settlement was dense and nearly continuous almost everywhere except in the limited areas that seem never to have been inhabited. Throughout highland Mesoamerica, at the end of the Classic period, large regional states like the one centered on Monte Albán broke up into smaller political units known as “petty kingdoms.” The political world of Postclassic Mesoamerica was a fluid, constantly shifting landscape of alliances, some forged by strategic marriages among noble families, others by conquest or acquiescence to the threat of war. Integration across political boundaries occurred through regional
market centers, religious shrines that attracted pilgrims from afar, and perhaps the movement of landless laborers who left their native territories to work foreign lands acquired by their lords.

Forty sites extend a kilometer (360 yards) or more along the ridgetops, and there are hundreds of smaller ones. Itzcuintepec (Nahuatl for “Dog Hill”), above the modern town of Santa María Peñoles in the heart of the survey area, is the largest settlement at more than 3,600 meters (3,900 yards) long. Within two kilometers (1.2 miles) are a half-dozen other large sites. This must have been the center of the Peñoles petty kingdom described in early Spanish accounts. It was similar in population size, internal structure, and organization to the smallest ones archaeologically identifiable in the Valley of Oaxaca.

Other smaller concentrations of settlements may have been under the dominion of different polities. Sites in the east, on the slopes above the Valley of Oaxaca, likely belonged to Valley kingdoms, a number of which had fortified hilltop retreats for the nobility during times of war. A second polity mentioned in early-sixteenth century chronicles is Tamazola, whose modern counterpart lies to the southwest, just outside our survey boundary. Archaeological sites in the southwest sector of the study area may have belonged to the Tamazola kingdom, at least during part of the Postclassic period. The distribution across the region of unusual, circular architectural features may be an important clue to the presence of a boundary between these political units. Future research in the Mixtec Sierra, including an expanded survey to the southwest and more intensive study at sites already mapped, will enhance our understanding of the emergence and historical development of this pan-Mesoamerican political form and the processes by which territories were defined and controlled.

In the Postclassic period, external relationships as they are indicated by pottery were far less monolithic than in earlier periods. Neither of the adjacent Valley’s ceramic styles dominate the entire Mixtec Sierra survey area. Instead, the distinctive styles of both occur at mountain sites, but in declining numbers as distance from the Valley of origin increases. Nochixtlán Valley pottery forms are common in the mountains at sites close to the Nochixtlán Valley, and rare at settlements nearer the Valley of Oaxaca. The distinctive bowl forms prevalent at Postclassic sites in the northern and western Valley of Oaxaca occur in great numbers at mountain settlements adjacent to the Valley but drop off in frequency at sites progressively farther west. The spheres of Nochixtlán and Valley
of Oaxaca styles overlap. There is no clear “ceramic boundary” permitting us to associate settlements (or the entire system of settlements) with one adjacent valley or the other. This observation, based on pottery, illustrates and underscores the earlier point about the importance of markets as integrative mechanisms linking communities across political boundaries. The spheres of Postclassic market exchanges were larger than political territories and, like many modern markets, overlapped one another.

**ANSWERS TO Questions**

The large-scale survey in the Mixtec Sierra was intended to provide information that could be analyzed to answer three broad, related research questions. We can address macroregional processes through broad comparisons between Mixtec Sierra settlement patterns and those of the “core” areas of southern Mesoamerica. Like the better known parts of central and southern Mesoamerica, in the Classic period the Mixtec Sierra tends more toward centralized organization around a pyramidal hierarchy (one that has a few large, powerful places and many more small towns and villages). In fact, its fortified towns may have been directly under the control of Monte Albán itself, or indirectly administered by a big, walled settlement on the eastern slope of the divide just west of Monte Albán. Our present evidence, though, suggests that this characteristic of its organization was a result of its strong ties to the centralized state ruled by Monte Albán. Still, the degree of centralization seems less than is found in core areas, since we cannot identify an obvious regional “capital” in the Classic period. In the Postclassic period, Mixtec Sierra settlement patterns differ little from those of other parts of Mesoamerica, especially in the Valley of Oaxaca and the Nochixtlán Valley. Its territory and population were about the same size as those of petty kingdoms throughout Mesoamerica. The entire Mesoamerican world was made up of small segments just like the Peñoles-Itzcuintepec kingdom, tied together not into massive, centralized states but knit loosely and fluidly into shifting political alliances and integrated across political boundaries by economic and other forces.

A second research question sought to understand long-term change in an environmentally marginal area on the periphery of a
core regional state. Perhaps as early as 800 B.C. a society only loosely
linked to the “outside” had begun to develop in the southern part of
our Mixtec Sierra survey area. Settlement continued up to the
Spanish conquest more than two thousand years later. New sites
appeared and grew, most of them occupied early on. The high
degree of settlement continuity in the region over such a long time
suggests that past systems of agriculture and adaptation in the
mountains differed substantially from the present ones and were
better-suited to long-term survival. Both internal and external fac-
tors bear on the history of human settlement in the Mixtec Sierra.
Some areas, like the corridor along the continental divide in the Late
Formative period, clearly were settled as part of Monte Albán’s
strategic external interests. In the Classic period, however, a combi-
nation of internal developments and superimposition of Monte
Albán’s control over an expanded western frontier was at work. In
the Late Postclassic, the Peñoles region was a small part like most
others of the mosaic of petty kingdoms that formed the political fab-
ric of Mesoamerica. Its ties through alliance or conquest undoubt-
edly shifted, but more stable economic and other links provided
integration to both the Valley of Oaxaca and valleys of the Mixteca
Alta.

Our third interest was the boundary between the Valley of
Oaxaca and Mixteca Alta regional systems. As we can identify
them archaeologically, boundaries shifted considerably over time
and were defined differently as these regional systems changed.
The western limit of the Valley of Oaxaca’s Classic period state
included our survey area and, in the southwest, apparently
extended beyond it. We cannot say whether the Classic period
inhabitants of the Mixtec Sierra identified themselves as Zapotec,
or spoke Zapotec languages (archaeological data do not speak
directly to such matters). But when pottery was imported or
received as gifts and “foreign” styles were imitated, Valley of
Oaxaca settlements were the source. The Classic period was a time
of large state consolidation and military expansion elsewhere in
highland Mesoamerica. Heavy fortifications at many mountain
sites in this period indicate a major concern with the integrity of
the Monte Albán state’s boundaries, although this may not have
been an interest (or in the interests) of most of the area’s inhabi-
tants. In contrast, pottery from Mixtec Sierra sites affirms that
political and other (especially, perhaps, economic) boundaries did
not coincide in the Late Postclassic period. Late Postclassic system
boundaries, then, were more diffuse.
**MORE QUESTIONS**

Better answers to all of these questions require more analysis of the existing data from the Mixtec Sierra, compilation of all existing settlement pattern data from the southern Mesoamerica highlands for analysis as a single data set and, alas, more fieldwork to collect additional information. These first two steps are underway, although the second will take years to complete. Our ability to understand long-term change in the Mixtec Sierra as a peripheral society is hampered by the paucity of artifacts attributable to the earliest occupations and the present impossibility of associating architecture with them. More intensive study at sites that yielded Formative pottery, including excavations, may be the only solution. Further surveys to the southwest, to determine the reach of Monte Albán’s power in the Classic period and to locate and delimit the sixteenth-century Tamazola kingdom in the Postclassic period, will improve our present understanding of boundaries and inter-polity relationships in the ancient urban societies of Mesoamerica.

**NOTES**

1. The Mixtec Sierra survey was funded by the Social Sciences and Humanities Research Council of Canada, the National Science Foundation, the National Geographic Society, and the Arts Research Board at McMaster University. Permission to carry out the fieldwork was granted by the Instituto Nacional de Antropología e Historia in Mexico.

2. Large-scale, or regional, archaeological surveys are designed to cover lots of ground (hundreds or, if possible, thousands of square kilometers) systematically. Resulting data include the location and number of archaeological sites in the area during each definable time period, the size of each settlement, the nature and approximate abundance of different kinds of artifacts and buildings visible on the surface at every one, and the contemporary environmental setting and land use patterns in the immediate area of every site.

3. The term *Mesoamerica* refers to the southern two-thirds of modern Mexico, Guatemala, Belize, and parts of Honduras and El Salvador. In ancient times, the nobility of Mesoamerica participated in a common system of exchanges and interactions which produced a high degree of similarity in many material aspects of elite culture, such as art, sculpture, architecture, and systems of writing and notation.


12. Ibid., p. 6.


15. In a settlement hierarchy, progressively more numerous and generally smaller sites are politically and/or economically dominated by the larger, more powerful (and less numerous) settlements at higher levels in the hierarchy. For example, during the Classic period Monte Albán, the regional capital, delegated many administrative tasks to two large “provincial” capitals fifteen to twenty kilometers
(nine to twelve miles) away, in different Valley arms. These cities, in turn, oversaw a variety of state functions carried out in other towns, some situated in the higher hills on the Valley edge to control movement of goods and people across the Valley’s boundaries, others located to produce agricultural surpluses, and so on. The larger sites at higher levels in the settlement hierarchy attracted people from surrounding towns and villages for kilometers to trade their own craft items or surplus farm products for materials, tools or other things they were unable to produce themselves. See Blanton, Kowalewski, Feinman, and Appel, *Monte Albán’s Hinterland, Part I*.

16. Feinman, Kowalewski, Finsten, Blanton, and Nicholas, “Long-Term Demographic Change.”

17. A macroregion is a multistate social system, although there may be no formal political or other official recognition of the interrelationships among the component states. Another term, world-system, is suggestive of either empires (which are bound by relationships of political dominance between formerly independent states, or world economies (which are dominated by massive exchanges of both bulk and luxury goods). A good example of the former is Imperial China; see G. William Skinner, ed., *The City in Late Imperial China* (Stanford: Stanford University Press, 1977). The modern world is an obvious example of the latter; see Immanuel Wallerstein, *The Modern World-System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (New York: Academic Press, 1974). The multistate systems, or macroregions, of ancient Mesoamerica consisted of independent political entities linked through social and other mechanisms to promote the shared interests of nobility; see Blanton, Kowalewski, Feinman, and Finsten, *Ancient Mesoamerica*, pp. 220–221.


21. A number of people have studied foot travel times in ancient Mesoamerica; there is no persuasive evidence that travel times were significantly longer in mountainous terrain. For a recent discussion and summary of earlier work, see George L. Cowgill, “Comments on Andrew Sluyter: Long-Distance Staple Transport in Western Mesoamerica: Insights through Quantitative Modeling,” Ancient Mesoamerica 4 (1993): 201–203.


24. This concentration of archaeological research on major valleys in highland areas, or on the territories immediately surrounding large urban centers, also characterizes research in other areas of the world where ancient complex societies arose, such as Andean South America and the Middle East. See Henry T. Wright, “The Evolution of Civilizations,” in David Meltzer, Don Fowler, and Jeremy Sabloff, eds., American Archaeology: Past and Future (Washington DC: Smithsonian Institution Press, 1986), pp. 323–365.

26. In stratigraphic excavations where deposits are undisturbed by later activity, earlier pottery is found under more recent pottery. Thus the relative age of different ceramic styles can be determined, and when absolute (or calendric) dates for layers of the archaeological cake are known, this age can be assigned to all pottery styles found in the dated layer. When vessel fragments of the same types are found on the surface at other sites, we can safely assume that they share the same date as the material dated in stratigraphic contexts.


28. Widespread site abandonments at this time also occurred in the Cuicatlán Cañada, a transportation corridor through the mountains north of the Valley of Oaxaca. See Redmond, A Fuego y Sangre.


31. Mary G. Hodge, Aztec City-States (Museum of Anthropology, University of Michigan, Memoir 18, 1984); Blanton, Kowalewski, Feinman, and Appel, Monte Albán’s Hinterland, Part I, pp. 307–366; Spores, The Mixtec Kings and Their People; Spores, The Mixtecs in Ancient and Colonial Times.


35. Peter Gerhard, A Guide to the Historical Geography of New Spain, 2nd


**Suggested Readings**


Renfrew, Colin, and Paul Bahn. *Archaeology: Theories, Methods, and Practice*. New York: Thames and Hudson, 1991. Although lengthy and tough sledding in places, this excellent introduction to archaeology is particularly strong in relating research methods and problems. Pages 446–454 summarize the results of research in Oaxaca.

Here we discuss the historical background of the 1545 cocoliztli epidemic and clarify several points made in the popular press. Previous genetic and isotopic research has shown that the 16th century individuals included in our study are of local Mixtec origin. However, the media coverage of our work has widely reported on the high numbers of Aztec individuals killed in the context of the 1545 epidemic together with the findings of our paper, thus conflating two different indigenous Mexican populations. Figure 1. Map of Aztec and Mixtec areas of influence at the time of European contact. Black shading indicates Aztec controlled territories in 1520 as recorded in the Codex Mendoza. Orange shading shows the lands historic