3

Guilá Naquitz in Spatial, Temporal, and Cultural Context

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INTRODUCTION

Two previous chapters have discussed (1) the origins of agriculture as a universal theoretical issue in anthropology, and (2) the problems of building an ecosystem model for plant collecting and incipient cultivation in the Tehuacán–Oaxaca region. In this chapter we concentrate on the specific archaeological sites used to reconstruct the Archaic lifeway in the Valley of Oaxaca, most importantly Guilá Naquitz Cave. We begin with an overview of the valley, gradually focusing down on its eastern, or Tlacolula arm, and the 16-km² area surrounding the Precolumbian "Fortress of Mitla." Here it becomes apparent that there are at least two environmental contexts for Guilá Naquitz. The first is the "original primary vegetation" of the area as reconstructed by C. E. Smith (1978); the second is the present-day vegetation, obviously disturbed by human activity, in which the "original" vegetation survives only in relict patches.

Space and environment, however, are only two of the contexts in which Guilá Naquitz can be discussed. It also was occupied during a specific time period, and by a group of people whose cultural pattern extended over a wider area of Mexico. These temporal and cultural contexts are considered later in the chapter.

THE VALLEY OF OAXACA

The Valley of Oaxaca lies in the southern highlands of Mexico, between 16°40′ to 17°20′N and 96°15′ to 96°55′W. It is drained by two rivers: the upper Río Atoyac, which flows from north to south, and its tributary, the Río Salado, or Tlacolula, which flows westward to join the Atoyac near the present city of Oaxaca. The valley is shaped like an irregular Y or three-pointed star, whose center is Oaxaca City and whose southern limit is defined by the Ayoquesco gorge, where the Atoyac River leaves the valley on its way to the Pacific coast. The climate is semiarid, with 500 to 700 mm of annual rainfall confined largely to the summer months. The valley floor lies at altitudes between 1420 and 1740 m, the lower elevations being semitropical and the higher elevations warm-temperate. It is surrounded by cooler and wetter mountains that rise to more than 3000 m (Fig. 3.1).

Bedrock Geology

The Ríos Atoyac and Salado and their tributaries have created the valley by erosion and dissection of three major geological formations (Lorenzo 1960). The oldest of these is a basal complex of Precambrian gneisses and schists, so thoroughly metamorphosed that their original petrographic composition is unknown. The second formation is a series of Mesozoic limestones, thought to be mainly Cretaceous and perhaps distantly related to the limestones of the Chiapas highlands. The most recent of the three major formations is a complex of Middle Tertiary (perhaps Miocene) volcanic tuffs known as ignimbrites. Ignimbrites are ash flow tuffs laid down not by explosive eruptions but by glowing avalanches that may smoulder for years; in Oaxaca they include such familiar variants as rhyolite and rhyodacite (Williams and Heizer 1965).

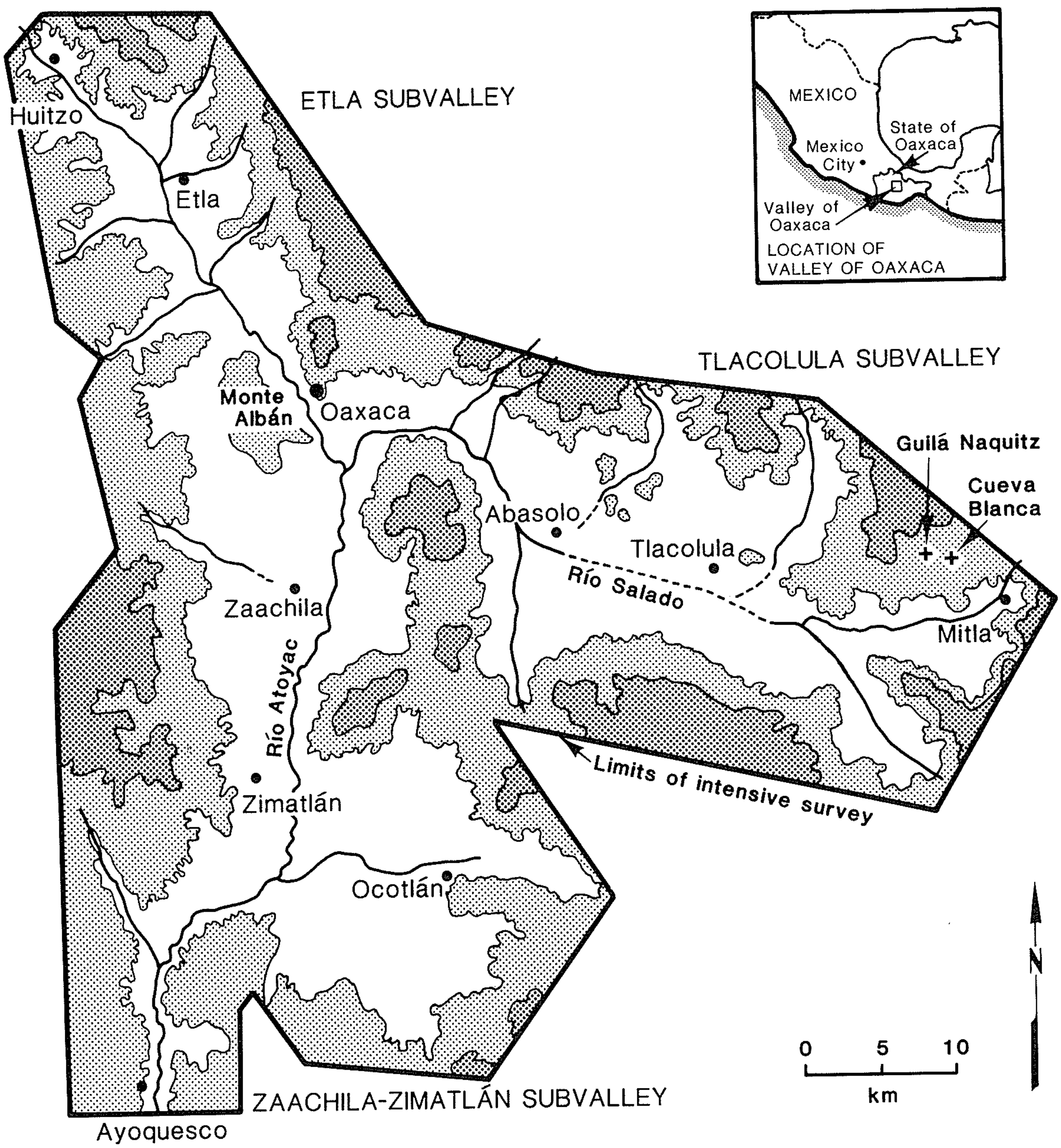

FIGURE 3.1. The intensively surveyed portion of the Valley of Oaxaca, showing the Etla, Tlacolula, and Zaachila-Zimatlán subvalleys. Light stipple indicates piedmont, heavy stipple the steeper mountains.

Physiographic Zones

Processes of Quaternary erosion and alluviation have sculptured these parent materials into four main physiographic zones: mountains, piedmont, high alluvium, and low alluvium (Kirkby 1973:9). The mountain zone, generally above 2000 m, is characterized by steeper slopes, cooler temperatures, and higher precipitation than the other zones. The extensive piedmont formed originally as a series of coalescing fans along the base of the mountains, but is now dissected into a line of ridges and arroyos delimiting the outer edge of the valley floor. Its average slope is 1–2° except where gullied, and it constitutes a zone of transition (in both physiographic and vegetational terms) between the mountains and the valley floor.

Of the two zones of alluvium, it is the high alluvium that is the most extensive and important. Representing the Pleistocene floodplain of the Ríos Atoyac and Salado, it has a gradient of less than 1° and forms the main part of the valley floor. The low alluvium, or present floodplain, occurs as a distinct geomorphic unit along less than 50% of the courses of the Atoyac and Salado, and may not have existed

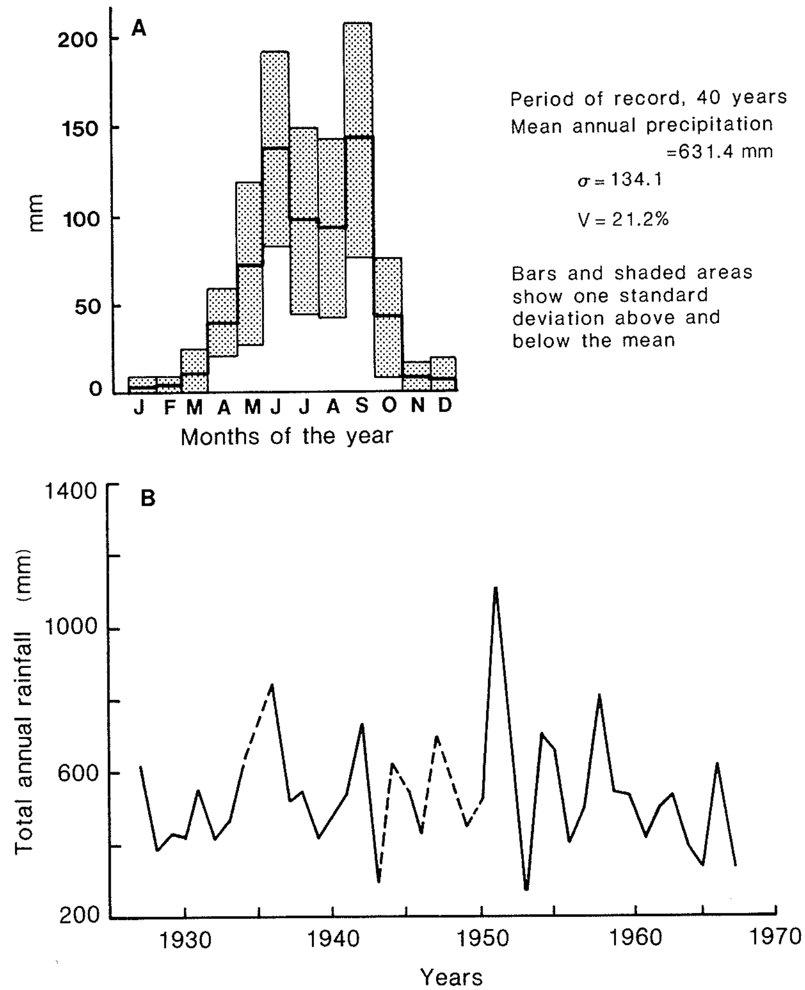

FIGURE 3.2. Rainfall in the Valley of Oaxaca. A, mean monthly precipitation at Oaxaca City; B, annual precipitation at Tlacolula between 1926 and 1968. (Redrawn from Kirkby 1973:Figs. 6 and 58.)

prior to A.D. 1500 (Kirkby 1973:15). It is a zone of lower rainfall and higher temperatures than the mountains or piedmont, although its subsurface water table may be high.

The native vegetation of the Valley of Oaxaca is greatly influenced by these physiographic zones and by the gradients of temperature, rainfall, evapotranspiration, and length of growing season that exist between the low alluvium and the high mountains. In simplest terms, the season of frost increases in length as one ascends higher into the mountains, while the likelihood of drought increases as one descends to the floodplain. The result is that the mountains have vegetation that can tolerate lower mean annual temperatures (8° at 3100 m) but needs higher mean annual precipitation (1000 mm); the floodplain vegetation is adapted to higher mean annual temperatures (21°C at 1540 m) and survives the lower mean annual precipitation (630 mm at Oaxaca City) by drawing on the subsurface water table. The piedmont, lying in between, has a tremendous variety of plants because of its transitional position.

The rainfall pattern "shows a sharp distinction between the dry winter months from November to March whose mean monthly rainfalls are less than 10 mm, and the summer rainy season. This characteristically begins in late April to May but does not become well established until June with its mean rainfall of 137 mm. The rainy season has two peaks, one in June and a second in September (mean rainfall = 144 mm). By October mean rainfall has fallen to 44 mm, and the rainy season usually ends as abruptly as it began" (Kirkby 1973:17; see also Fig. 3.2, this chapter).

Native Vegetation

It is not easy to reconstruct the original wild vegetation of a valley whose floor has been disturbed by agriculture for more than 7000 years, whose piedmont has been grazed by goats for at least 400 years, and whose mountains are filled with woodcutters and charcoal burners. However, botanist C. Earle Smith has attempted such a reconstruction based on (1) surviving remnants of the original vegetation, (2) principles of plant growth as they apply to the physiographic features described above, (3) knowledge of vegetation in similar environments in neighboring valleys, and (4) plant remains recovered by archaeological excavation (Smith 1978:17–22, Map 2). All evidence suggests that the Valley of Oaxaca was originally covered by forest, brush, or low monte—unlike the open, grassy valley we see today, which is a product of agricultural land clearance.

Along the Río Atoyac and its major tributaries, wherever there were clay soils and water table within 3 m of the surface, Smith sees a mesophytic (riverine) forest composed of willow (*Salix*), alder (*Alnus*), baldcypress or ahuehuete (*Taxodium*), fig (*Ficus*), *Annona, Cedrela*, and possibly wild avocado (*Persea*). There would have been many evergreen species in this forest; and it would have been tall and shady, with a canopy perhaps 15 m to the lowest branch. In areas where the water table was similar but soils were sandy, such a mesophytic forest would have been lighter. Constant demands for firewood and building materials have reduced this forest to occasional patches of alder and willow, or isolated ahuehuetes like the group at Santa María del Tule.

On the high alluvium beyond the natural levees of the major rivers, where subsurface water table falls to between 3 and 6 m, Smith sees a forest dominated by mesquite (*Prosopis*) but thickly intergrown with other legume trees such as huizache (*Acacia*) and members of the families Burseraceae, Malvaceae, and Euphorbiaceae. While this formation would have included a few evergreen taxa, most species were deciduous, and the canopy would have been closed only during the summer rainy season. This is a zone whose wild plant resources would have been richest between May and late August.

Beyond the mesquite forest, where the water table drops below 6 m, began a zone of thorn–scrub–cactus forest that once covered the margins of the high alluvium and the lower slopes of the piedmont. This vegetation zone, dependent on seasonal rainfall rather than groundwater, would have been relatively bleak in the late dry season but relatively rich after the summer rains. Smith (1978:20) reconstructs this thorn–scrub forest as "similar to that described for the northeastern side of the Tehuacán Valley (Smith 1965)" and sharing many of the same species. While many of the elements of the mesquite forest struggle on into this zone, it is also characterized by trees like the *guaje* (*Leucaena*) and *tepeguaje* (*Cassia*), and shrubs like the *mala mujer* (*Jatropha urens*). Maguey (*Agave* spp.) and yucca are common, as is the prickly pear (*Opuntia* spp.). Organ cacti include *Lemaireocereus, Myrtillocactus,* and *Cephalocereus*. "At its finest development, this association must have had a canopy ranging between 5 and 10 m. tall, depending on exposure, soil moisture, etc." (Smith 1978:24). This canopy, however, would have remained open because the rigors of the dry season prevented plants from concentrating densely.

As one ascended to the upper piedmont and lower mountain zone, the thorn–scrub–cactus forest would gradually have thickened and eventually come to include oak trees. Today this transition takes place between 1700 and 1900 m elevation, but, since pollen data show climatic fluctuations in prehistory (Chapter 15), we cannot specify exactly where it was at any one time. Smith's (1978) reconstruction shows an oak–pine forest covering the mountains around the valley of Oaxaca. While oaks (*Quercus* spp.) would have dominated the lower reaches of this forest, the balance would gradually have shifted in favor of pines (*Pinus* spp.) as one moved higher in elevation. One of the pines documented in the archaeological record—the piñon pine—has apparently disappeared from this forest, perhaps because all pine species are selectively overharvested by charcoal burners. Pine has apparently been the preferred genus for hearth charcoal since at least 1000 B.C.

In Smith's reconstruction, the original oak–pine forest would have consisted of "much larger trees spaced much farther apart," with a canopy "completely closed in areas of oak dominance" (1978:25). Even today the oak zone is one of magnificent beauty, with trees such as black walnut (*Juglans*), black zapote (*Diospyros*), manzanita (*Arctostaphylos*), and madroño (*Amelanchier*) overlooking shady canyons carpeted with oak leaves. One of the areas richest in edible wild plants is the transition from upper thorn forest to oak forest; its resources are at their peak during the terminal rainy season and early dry season (September–December).

The Tlacolula District

Of the three subvalleys forming the irregular Y of the Valley of Oaxaca, the driest is the Tlacolula arm (Kirkby 1973:15–25; Smith 1978:9–11). Lying at 1620 m elevation, Tlacolula, the district capital, has a mean annual precipitation of only 550 mm and a potential evapotranspiration of 2020 mm. By contrast, Oaxaca City has an annual precipitation of 630 mm and a potential evapotranspiration of only 1890 mm; comparable figures for Etla, the capital of the rainiest arm of the valley, are 650 mm precipitation and 1670 mm evapotranspiration.

Accompanying Tlacolula's overall aridity is a longer-lasting dry season. While Oaxaca City generally has no recorded precipitation between December and February, Tlacolula "frequently records no rainfall for the entire November through March period" (Smith 1978:9). The length and severity of this dry season strongly affects the seasonality of vegetation in the Tlacolula subvalley, especially the deciduous species.

Mitla and the Eastern Tlacolula Valley

This volume is mainly concerned with the eastern third of the Tlacolula valley, a region whose landscape is dominated by mountains and mesas of Tertiary volcanic tuffs (Fig. 3.3). In a sense, this arm of the valley begins at Mitla, where the upper Río Salado (known locally as the Río Grande de Mitla) enters the valley by way of a steep-sided canyon carved out of ignimbrite. This canyon is lined with caves and rockshelters, the most famous of which is Cueva del Diablo (Parsons 1936:295).

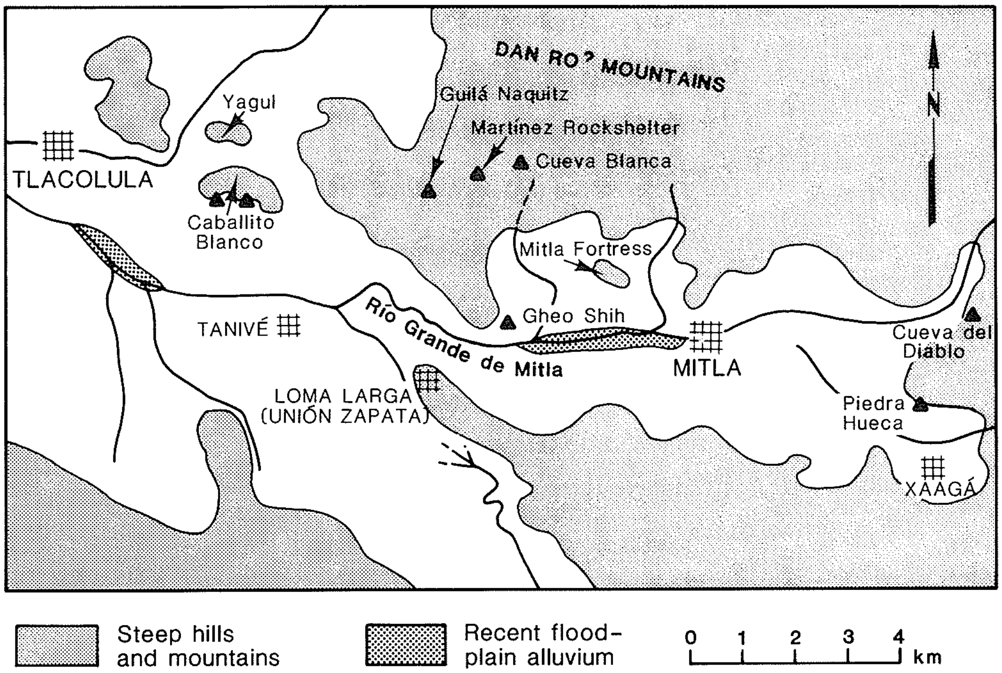

FIGURE 3.3. The eastern end of the Tlacolula subvalley, showing Guilá Naquitz and other places mentioned in the text.

Running southwest out of the canyon, the river turns and flows due west for about 4 km until it passes under the bridge at Mitla. Here it is deeply incised in a ribbon of silty high alluvium only a kilometer wide, running east–west at an elevation of 1688 m (5537 feet). To either side of this alluvial strip, an apron of piedmont rises gently toward the mountains that overlook the valley from a distance of roughly 2 km.

Of all these mountains, the most impressive is the range to the north that the Mitla Zapotec call *Dan Roˀ*, "big mountain, the mountain which 'does not shake during earthquake' " (Parsons 1936:295). Dan Roˀ is more than 15 km long east–west and 12 km wide north–south, and its pine-forested ridgetop lies at 3000 m on the continental divide. Both Schmieder (1930:Map 4) and Parsons (1936:295) report a ritual cave, *Biliyär Calaver*, near the top of the ridge a day's journey from Mitla. It is the canyons and lower slopes of the Dan Roˀ, however, that have the greatest number of occupied caves and rockshelters.

Beyond the bridge, the Río Grande de Mitla continues westward for another 4 km until the valley narrows to 1000 m between rocky spurs. Here, near the hamlet of Loma Larga (Unión Zapata), an *agencia* of Mitla, the lands of Mitla end and the central Tlacolula valley begins. Along the north bank of the river, just east of the narrows, lies the preceramic open-air site of Gheo-Shih. Beyond it, the river continues westward into the Tlacolula plain and becomes the Río Salado.

From the standpoint of the preceramic era, one of the most interesting areas of the Valley of Oaxaca is that bounded on the west by Unión Zapata, on the east by Mitla, on the south by the Río Grande, and on the north by the higher reaches of the Dan Roˀ. The area is shaped like a vast amphitheater whose curving back wall is formed by the retreat of the mountains to a point some 2.5 km north of the river. The floor of the amphitheater is rock, covered thinly in places with a poor, sandy soil derived from the weathering of volcanic tuff. At center stage is the Mitla Fortress, a steep ignimbrite mesa whose crest was fortified in Postclassic times. This mesa was a source of silicified ignimbrite for Precolumbian tools (Holmes 1897:287; Williams and Heizer 1965:47; and Whalen, Chapter 7, this volume), and chipped-stone artifacts lie scattered on the surface for many kilometers in every direction. Because of the shallow soils, erosion, and wind deflation in this area, preceramic tools are easier to find on the surface here than elsewhere in the Valley of Oaxaca. Furthermore, along the north bank of the Río Grande de Mitla there are places where the indurated Pleistocene alluvium—almost always deeply buried elsewhere in the valley—lies exposed near the surface. Such exposures sometimes reveal preceramic open-air sites such as Gheo-Shih.

We have no reason to believe that this natural amphitheater of mountains, piedmont, and narrow alluvium was used more intensely by hunters and gatherers than any other part of the valley. It simply has, for a variety of reasons, better environmental conditions for the preservation of preceramic sites. Here the base of the Dan Roˀ is dissected by steep-sided canyons of strongly welded or sillar-type ignimbrites. The cliffs are suitable for cave formation, and the canyons themselves served as routes for travel between the valley floor and the pine-forested ridgetops. Most canyon streams are ephemeral at best, but a few originate at springs in the Dan Roˀ. The area is so dry that open-air sites normally buried by alluviation have instead been deflated or uncovered until they are readily found on survey. Because of these conditions, we concentrated our preceramic surveys and excavations in the Mitla region and must rely on that area heavily because preceramic sites are so difficult to find elsewhere.

The 16-km² region west of Mitla and north of the river had other advantages from the standpoint of our research goals: Now largely uninhabited ejido land, its flora comes as close to resembling Smith's original "primary vegetation zones" as any area left in the valley. Once incorporated by a large ranch or hacienda named for the Mitla Fortress, part of it was still known as "El Rancho del Fuerte" when Parsons (1936:18) visited Mitla between 1929 and 1933. In 1966, the canyons and slopes on the back wall of the amphitheater were forested communal lands that the *agencia* of Loma Larga used sporadically for goat grazing. In the years since the overthrow of the haciendas and the establishment of the ejido system, the vegetation of this area was given a chance to return to the point where Smith (1978:22) was able to say, "only in the Mitla arm of the valley, toward Guilá Naquitz Cave, are there some remnants of the original vegetational cover."

Best represented of these remnants is Smith's "thorn–scrub–cactus forest," still recognizable from the talus of Guilá Naquitz in spite of centuries of human exploitation. It occurs as relict patches in the present-day vegetation zone we have called "Thorn Forest A" (Chapter 4). Less recognizable, but still struggling bravely to return whenever it is given a chance, is Smith's "mesquite forest," which once occurred downslope from the thorn–cactus–scrub. It has been largely replaced by the present-day zone we now call "Mesquite Grassland B"; but even within this floral community, there are still groves of large mesquite trees, and should the land stand fallow for 10 years or so, it eventually reverts to *Prosopis* and *Acacia*. We were indeed fortunate that these remnants of the original vegetational cover of the eastern Valley of Oaxaca coincided with the area of our best preceramic sites, for without them a great many of the analyses in the second half of this volume would not have been possible.

THE DISCOVERY OF GUILA NAQUITZ

Guilá Naquitz Cave is a small shelter at the base of a large ignimbrite canyon wall located high above the valley floor some 5 km northwest of Mitla (Fig. 3.4). The cliff occurs at an elevation of 1926 m (6319 feet) above sea level (nearly 300 m above the Río Grande de Mitla) and faces southeast toward the Mitla Fortress. The cave, 16°57′ N and 96°22′ W, lies near one of the main footpaths through the Dan Ro? mountain range between Mitla and Díaz Ordaz (Sto. Domingo del Valle). The area is ejido land belonging to Loma Larga (Unión Zapata).

Actually, the cave has no name; we have borrowed the name of the rock formation, which the Mitla Zapotec refer to simply as "the white cliff." *Guilá*, "cliff" (from *gui*, "rock"), and *naquitz*, "white," are the Mitleño pronunciations of words that can be traced back at least as far as sixteenth-century Valley Zapotec. In that era, such a cliff would have been referred to as *Quieláa Naquichi* (Córdova 1578).

In December of 1964, armed with a copy of Lorenzo and Messmacher's (1963) "Hallazgo de Horizontes Culturales Precerámicos en el Valle de Oaxaca," I flew to Mexico City to speak with José Luis Lorenzo and Ignacio Bernal. Lorenzo showed me the projectile points Messmacher had collected near Mitla and Xaagá. Bernal provided me with a card catalogue of the first 275 archaeological sites found by his surveys in the Valleys of Oaxaca, Ejutla, and Miahuatlán. Both encouraged me to continue on to Oaxaca to examine Lorenzo and Messmacher's rockshelters and look for others.

At that time my sister, Liza Flannery Arredondo, and her husband, Humberto Arredondo, lived in Mexico City where Humberto was a business executive. Liza and Hue generously loaned me their Mercedes Benz sedan to take to Oaxaca for cave survey. Had they seen some of the places I eventually took it, they might well have had second thoughts; it was akin to loaning Bonnie and Clyde your passenger car for a bank robbery and subsequent getaway. Miraculously, the Mercedes climbed canyons and negotiated donkey trails where few 4-wheel-drive vehicles could have gone, getting high-centered only twice and wedged between boulders only once.

On December 16, 1964, I visited the first of the small rockshelters in the Caballito Blanco Mesa near Tlacolula. This became OC-1 ("Oaxaca Cave No. 1") in the survey numbering system I had borrowed from MacNeish. It soon became apparent that the Caballito Blanco shelters had mainly shallow deposits related to the Monte Albán I–V occupations of the Tlacolula region. The small shelters at Piedra Hueca near Xaagá also proved disappointing, for although preceramic flint tool types could be found on the talus slope below, the shelters themselves were so shallow that most amounted to little more than surface scatters.

At the Museo Frissell de Arte Zapoteca in Mitla I was greeted enthusiastically by John Paddock, whose excavations at Yagul in 1958 had provided my first field experience in Oaxaca. Paddock accompanied me on the Xaagá survey and introduced me to several Mitla villagers who knew the surrounding mountains well because they had herded goats there as young boys. Darío Quero, who had been a child when Elsie Clews Parsons did her fieldwork in Mitla,[1] directed me to Cueva del Diablo where Parsons had done the first "testing" of a Mitla cave (Parsons 1936:295). Parsons' description make it appear that she found Postclassic miniature offering vessels, which confirmed my suspicion that this important ritual cave had mostly very late deposits; it was also too wet to have any preservation of perishables.

One day as we surface-collected the dissected plains near the Mitla Fortress, one of the Zapotec employees of the Frissell Museum pointed off toward an unsurveyed area of mountains and piedmont some kilometers to the northwest. He remembered a cave somewhere up there, he said, that he

[1]In her Preface, Parsons (1936:x) thanks "papacito, tiny Darío with the clothes and manners of a vivacious *anciano*" for being one of the people who made her stay enjoyable. His hospitality during our stay in Mitla some 30 years later was greatly appreciated as well.

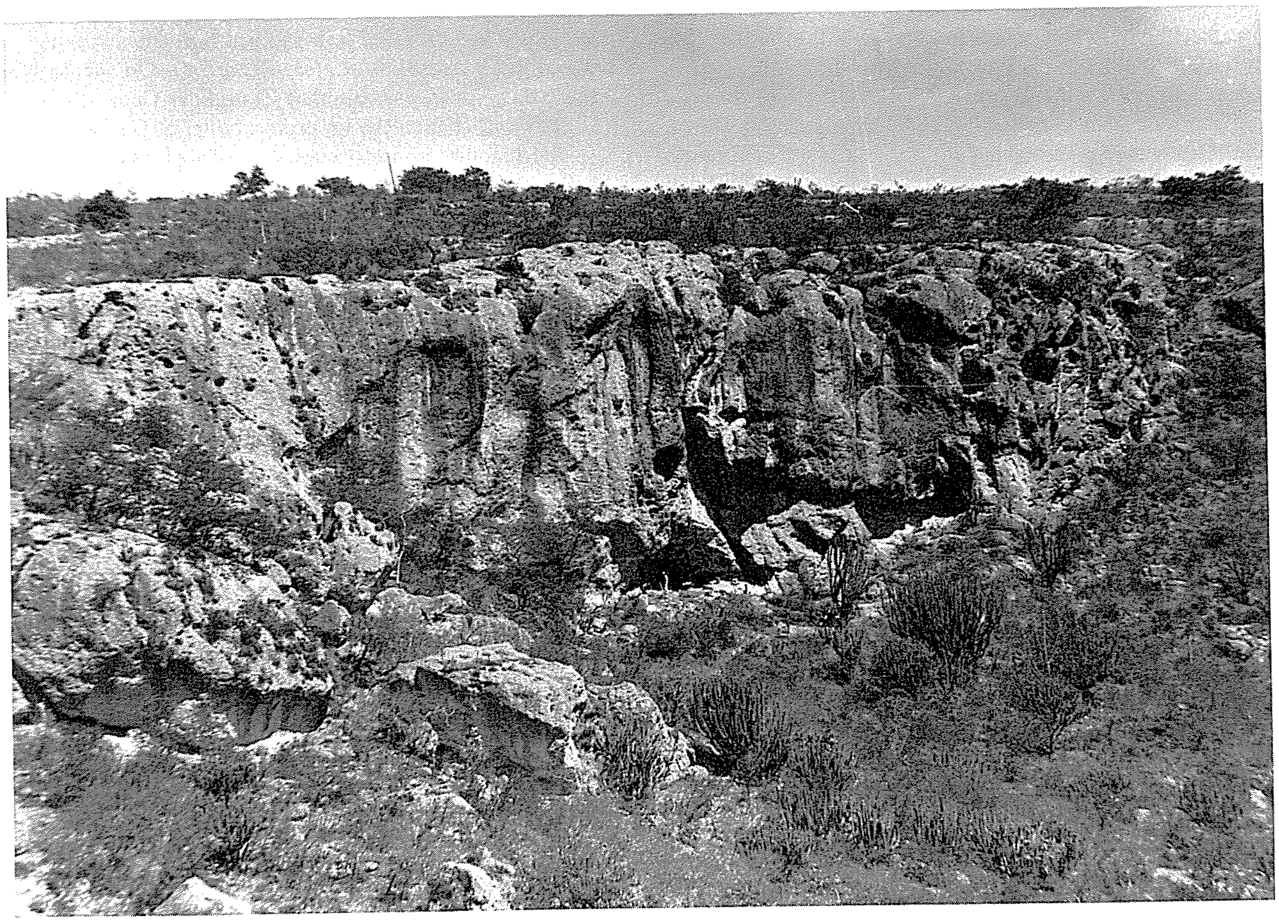

FIGURE 3.4. Guilá Naquitz Cave.

had taken refuge in when he and his goats were caught in a spring rainstorm. The Mitleños called it *Biliyär Keyh* ("Cueva Oscura") because it appeared as a lozenge-shaped black dot from a distance. On December 23 I parked the Mercedes near the Mitla–Matatlán crossroads and struck out on foot for the area my informant had pointed to. After about an hour I had isolated a suspicious-looking black dot in a volcanic tuff cliff and climbed toward it through groves of organ cactus and stinging *mala mujer.* As I reached the talus slope a Trinidad point, an Abasolo point, and a Kent point practically leaped up at me, and inside the cave I found crude blades and steep denticulate scrapers lying on a bed of Precolumbian corncobs, maguey quids, and pot sherds. This site became OC-27, known as *Biliyär Keyh* to Zapotec speakers but *Cueva Redonda* to the Spanish speakers of nearby Loma Larga.

Overjoyed with the surface collection, I was interrupted briefly by a group of rabbit hunters from Loma Larga who wondered what a gringo was doing on their ejido land. "Looking for caves," I explained, and one of them smiled and said, "There's a much bigger one around the bend of the next canyon. We call it *la Cueva Blanca.*" I decided to spend the rest of the afternoon surface-collecting the Cueva Redonda talus and return the next day.

On December 24, 1964, I climbed the next canyon and found OC-29, OC-30, and OC-31, the "Cueva Blanca group." More than any other site, OC-30 launched the Oaxaca project, for it seemed clear that Cueva Blanca would have preceramic occupation over a considerable area and to substantial depths. The next day I spent a Christmas far from home and family writing the first draft of a grant proposal.

A whole year was to pass before I was back in Mitla again, supplied with a 4-wheel drive pickup truck and a grant from the Smithsonian Research Foundation. On January 22, 1966, I began the survey for preceramic sites again, assisted this time by Eligio Martínez of the Frissell Museum, Chris L. Moser of the University of the Americas, and Silvia Maranca, a Brazilian student who had recently spent a year at the Smithsonian.

Fanning out from Cueva Blanca, our survey reached the canyon below a long cliff Eligio knew only as *Guilá Naquitz,* "La Peña Blanca." There were small caves in it everywhere, and while Eligio and Silvia surface-collected the middle part of the cliff, I climbed up to Gui Gohtz Pass where the canyon began. On January 26, 1966, my survey notebook records the following entry:

> OC-43. Small cave (8 × 10 m with 3m-high ceiling) just NE of Gui Gohtz Pass, along W. Cliff of canyon running S–N toward Cueva Blanca. Cave faces E or SE onto canyon. Estimated time range, preceramic and Postclassic. Very dry, with good preservation of corn cobs, maguey quids, grass and other plant remains. Could be 1.5–2.0 m deep, and first 50 cm will be practically solid plant remains. Surface collection includes one-half of a projectile point with a concave-based stem; lots of steep scrapers; manos; metates; Postclassic sherds; and lots of chipped stone debitage.

This small cave, OC-43, arbitrarily named Guilá Naquitz after the cliff in which it occurs, is the focus of this volume. Survey continued for another week or so, after which time it was decided to test several of the caves and rockshelters that had been found. To make this process somewhat easier, we constructed a road into the area so that we could drive our workmen and equipment to within a few hundred meters of the caves. Once this had been done, we revisited each cave with a crew of four Zapotec workmen from Mitla and had them spend all afternoon intensifying our surface collection in the thorn-forest cover of the talus. In the case of Guilá Naquitz, this more intensive surface collection produced a second projectile point with a concave-based stem. This complete specimen, which we now know belongs to the Pedernales type, was different from any found at Cueva Blanca or Cueva Redonda and hence suggested that we were dealing with at least two preceramic assemblages.

During February of 1966, we tested several caves out of our sample of more than 60, and decided that Guilá Naquitz and Cueva Blanca were the best. Once this had been determined, we expanded the excavation at those two sites in April and completed them in May. Survey for preceramic sites did not end there, however; renewed searches in 1967 produced the open-air preceramic sites of Gheo-Shih (OS-70) and OS-71, also near Mitla. Even at this writing, surveys of the Tlacolula–Mitla region directed by Stephen A. Kowalewski are continuing to locate preceramic open-air sites, and it seems likely that more such sites will turn up in the future as land clearance and canal digging expose buried Archaic horizons.

THE CHRONOLOGICAL AND CULTURAL PLACEMENT OF GUILA NAQUITZ

The chronological placement of Guilá Naquitz is discussed in detail in Chapter 14. The radiocarbon dates from its preceramic living floors run from 8750 B.C. (Zone D) to 6670 B.C. (Zone B2), and the artifacts from these levels give us no reason to disbelieve the dates. In general, the preceramic assemblage from Zones E-B1 at Guilá Naquitz are internally consistent enough to allow us to assign them all to a single phase, called "Naquitz."

There is one living floor at another site that we would also assign to the Naquitz phase. This is Zone E at Cueva Blanca, which has provided four radiocarbon dates ranging between 9050 and 8100 B.C. (see Table 3.1). On the basis of these dates, it is possible that Zone E at Cueva Blanca is slightly earlier than the lowermost zones at Guilá Naquitz.

The Naquitz phase occupies a span of time that is interesting for two reasons. First, its earliest dates fall very near the supposed transition from the Paleoindian period, with its now-extinct Pleistocene fauna, to the early Archaic period, with its Holocene fauna. Second, by the end of the Naquitz phase we have our first evidence for local plant domestication.

Obviously, we had hopes of correlating our preceramic sequence in Oaxaca with the chronological phases worked out for the Tehuacán Valley by Johnson and MacNeish (1972), but it proved impossible to correlate the Naquitz phase precisely with Tehuacán. Naquitz contains only "modern" fauna and should therefore be more recent than the Early Ajuereado phase in the Tehuacán Valley, which yielded animals now extinct in both Tehuacán and Oaxaca. Despite its Holocene fauna, however, Naquitz cannot be correlated with the El Riego phase in the Tehuacán Valley, since the El Riego phase runs from 7000 to 5000 B.C. and includes numerous projectile point types so far unknown from Naquitz. Johnson and MacNeish (1972:39–40, Fig. 4) regard Naquitz as being contemporaneous with Late Ajuereado in the Tehuacán Valley, while having an artifact complex more like that of the Santa Marta phase in central Chiapas, which

TABLE 3.1
Tentative Correlation of Preceramic Cultural Phases in the Valleys of Oaxaca and Tehuacán

Oaxaca phase[a]	Site and level	Tehuacán phase
Martínez (± 2000 B.C.)	Yuzanú site Martínez Shelter, 10–15 cm	Abejas (3400–2000 B.C.)
Blanca (3300–2800 B.C.)	Cueva Blanca C Cueva Blanca D	
Jícaras (5000–4000 B.C.)	Gheo-Shih A, B	Coxcatlán (5000–3400 B.C.)
Naquitz (8900–6700 B.C.)	Guilá Naquitz B1 Guilá Naquitz B2 Guilá Naquitz B3	El Riego (7000–5000 B.C.)
	Guilá Naquitz C Guilá Naquitz D Guilá Naquitz E Cueva Blanca E	Late Ajuereado
Late Pleistocene (> 10,000 B.C.?)	Cueva Blanca F	Early Ajuereado (> 10,000 B.C.?)

[a]Exact beginning and ending dates are not given for the Oaxaca phases because the sample of radiocarbon dates is too small for such precision. The same is true for the Early and Late Ajuereado phases in the Tehuacán Valley. Dashed line indicates the transition from Pleistocene to Holocene.

also runs from 7000 to 5000 B.C. (MacNeish and Peterson 1962). Actually, Naquitz shares some projectile point types with late Ajuereado, El Riego, and Santa Marta, but is not identical to any one of those.

In the Valley of Oaxaca, the Naquitz phase was followed by the Jícaras phase, whose type site is Gheo-Shih. Gheo-Shih is easier to correlate with the Tehuacán sequence, since it produced a much larger sample of projectile points. The most common point is the Pedernales type, with its short, broad stem and concave base. MacNeish *et al.* (1967:78 and Fig. 67) report a single Pedernales point from Level 4 of El Riego Cave West in the Tehuacán Valley, a component of the Coxcatlán phase. This Pedernales point from El Riego Cave, considered unique and "aberrant" in the Tehuacán collections, looks so similar to Gheo-Shih specimens that we would not be surprised to learn that it came from Oaxaca. Other projectile point types, such as La Mina, Trinidad, and San Nicolás, link the Jícaras phase in the Valley of Oaxaca to the Coxcatlán phase in Tehuacán.

In cultural terms, we could summarize Guilá Naquitz's position in the following way. During the Early Ajuereado phase, under the cooler and drier conditions of the late Pleistocene period, the occupants of the southern Mexican highlands hunted native wild horse, pronghorn antelope, and jackrabbit, sometimes by communal drives (Flannery 1966, 1967). With warming temperatures at the onset of the Holocene, the thorn–scrub–cactus forest reconstructed by Smith (1978) spread over Oaxaca and Tehuacán, and many Pleistocene animals disappeared; so, apparently, did communal game drives. The early Archaic witnessed the establishment of the microband–macroband foraging pattern originally defined by MacNeish (1964, 1972) and discussed elsewhere in this chapter. The Late Ajuereado foragers in Tehuacán and the Naquitz phase foragers in Oaxaca may have been among the first to display this early Archaic settlement-subsistence pattern. What followed in both areas was incipient agriculture.

GUILA NAQUITZ IN ITS DEMOGRAPHIC CONTEXT

To understand the kind of sample of prehistory that Guilá Naquitz might represent, we must consider the population density of preceramic hunter–gatherers in the southern Mexican highlands and the numbers of camps they might have left behind. I have already done this in a recent paper (Flannery 1983), which I only summarize briefly here.

Out of a sample of more than 60 caves we visited, no more than half a dozen appeared to have preceramic deposits we could actually excavate; a few others had Archaic projectile points on the talus but no depth of deposit inside. Similarly, stray preceramic artifacts were not uncommon on the surface in the Mitla area, but Gheo-Shih was our only open-air site with enough deposit to excavate. If we assume that Gheo-Shih was occupied by a macroband of 25 persons whose "territory" was the eastern half of the Tlacolula Valley, there might have been no more than 50 persons in the entire Tlacolula arm of the Valley of Oaxaca during the Jícaras phase. Extrapolation from this would give us 150 persons in the entire 700 km^2 of flat valley floor in the Valley of Oaxaca, or 1 person per 4.7 km^2 of valley floor. However, if we assume that the Gheo-Shih macroband's territory was the entire Tlacolula Valley, there might have been only 3 such bands in the Valley of Oaxaca, for a total population of 75 and a density of 1 person per 9 km^2.

These figures can be compared with our estimates for the Tehuacán Valley during the El Riego phase, where MacNeish's (1972:Fig. 3) map shows 7 macroband camps and 13 microband camps from the entire 2000-year span of the phase, over a surveyed area of 1400 square miles.[2] Remembering that microband camps were simply the lean-season settlements made by the same people who lived at macroband camps during high-resource seasons, we included only macroband camps in our calculations and can give the following estimates for the El Riego phase: (1) if all macroband camps were occupied simultaneously (unlikely), 1 person per 10 square miles; (2) if they were occupied sequentially (more likely), 1 person per 70 square miles. In other words, judged by the archaeological sites recovered, early Archaic populations in the Tehuacán–Oaxaca region are estimated to have been within the range of other hunter–gatherers listed by Steward (1955:125), "ranging from a maximum which seldom exceeds one person per 5 square miles to one person per 50 or more square miles" (Fried 1967:55). These low population figures help to explain why I have always been skeptical of population-pressure theories of the origins of agriculture, at least for Mesoamerica.

Of course, the group occupying the eastern Valley of Oaxaca did not exist in isolation. Based on estimates by Wobst (1974) and Birdsell (1968), I have suggested that the preceramic hunter–gatherers of the Valley of Oaxaca were "organized into *families* of 2 to 5 persons who harvested wild foods together at places like Guilá Naquitz, and in turn belonged to *local groups* averaging 25 persons, all of whom might camp together at places like Gheo-Shih when resources permitted. These local groups would have been linked by marriage into an *effective breeding population* of 175 or more persons occupying neighboring valleys, and a still larger *dialect tribe* of at least 500 persons," all speaking a mutually intelligible dialect of Proto-Otomanguean (Flannery 1983:36). Such a dialect tribe would almost certainly have included the occupants of the Tehuacán Valley, with whom the Mitla foragers may occasionally have exchanged artifacts—Pedernales points going to Tehuacán, Coxcatlán

[2] I am happy to have the opportunity here to correct a typographical error in the text of Topic 8 of *The Cloud People* (Flannery 1983). I gave the area of the Tehuacán Valley as "70 by 20 miles, for a total of 140 square miles" (p. 35). The latter figure should, of course, be 1400 square miles. This means that even if all 7 macroband camps were occupied simultaneously (a very unlikely situation), the El Riego population density would be 105–175 persons in 1400 square miles, or about 1 person per 10 square miles (not "1 person per square mile" as I stated on p. 35). I thank Norman Hammond for being the first person to bring this error to my attention.

points to Oaxaca (Flannery *et al.* 1981:59–60; and Hole, Chapter 6, this volume).

Given all these population estimates, what kind of a sample was Guilá Naquitz? I have already estimated that (assuming macrobands changed their base camp every year) MacNeish's 7 El Riego phase macroband sites might represent no more than 0.4% of the macroband camps made during the 2000 years of the El Riego phase (Flannery 1983:35). In the case of the eastern Valley of Oaxaca, let us assume that the Naquitz phase lasted for 2200 years, from 8900 to 6700 B.C. (Chapter 14). Gheo-Shih could, on the basis of our current evidence, have been occupied at least twice; it might therefore represent one one-thousandth (0.1%) of all the macroband camps made in the Tlacolula arm of the valley. The situation is even worse for Guilá Naquitz; if we assume every macroband of 25 persons broke up annually into 5 microbands of 5 persons each, there could have been more than 10,000 microband camps made during the Naquitz phase. The 6 preceramic living floors at Guilá Naquitz might therefore represent less than 0.06% of the microband camps made during the Naquitz phase in the eastern Valley of Oaxaca.

GUILA NAQUITZ IN THE CONTEXT OF BINFORD'S FORAGER-COLLECTOR DICHOTOMY

In Chapter 1 we examined Binford's (1980) proposal that most hunting–gathering societies occupy a position along a strategic continuum from foraging to collecting. Foragers, the most mobile, travel to where the food is, and their settlement pattern becomes dispersed or aggregated according to whether resources are dispersed or aggregated; collectors, the most nearly sedentary, tend to remain in one favored locality while logistically organized task groups go out and bring back resources. Binford also discussed the role of food storage in prolonging the season of abundance, and we argued that in Oaxaca, such storage would be a way of adapting to drought rather than cold. We also acknowledged that most hunters and gatherers fall somewhere between Binford's two extremes, and that some groups forage for plant foods while organizing their ungulate hunting logistically through all-male hunting parties.

This last statement is similar to the way I would describe the group that occupied Guilá Naquitz. I would place them near the foraging end of the continuum because they appear to have changed residence several times a year as different resources became available; they were at Guilá Naquitz in the autumn when acorns were abundant, moved elsewhere during the January–May dry season, and may have camped in the valley-floor mesquite groves during the June–August rains. However, at various times of the year their deer hunting may have been done by small groups of men who went out from the main camp and later returned with the meat. Occasional pits, apparently for acorns, also make it clear that the Guilá Naquitz group engaged in at least small-scale storage.

GUILA NAQUITZ IN THE CONTEXT OF MACNEISH'S MACROBAND-MICROBAND DICHOTOMY

In his work in the Tehuacán Valley, MacNeish (1964, 1972) distinguished two types of preceramic settlements. These were *macroband camps,* occupied for a season or more by 15–25 persons, and *microband camps,* occupied by 2–5 individuals for any period from a day or two to most of a season. Using Steward's (1938, 1955) model for Great Basin hunter–gatherer settlement patterns as his major framework, MacNeish reasoned that microband camps were produced by family collecting bands like those of the Paiute or Shoshone. Macroband camps would then represent places where several families coalesced during a time of abundant resources. MacNeish's reasoning was supported by the fact that archaeological microband camps in Tehuacán often contained both "men's tools" (e.g., projectile points) and "women's tools" (e.g., metates) as well as foods presumably collected by both men (e.g., deer) and women (e.g., wild fruits). This suggested that many microbands in Tehuacán were family groups (men, women, children) rather than the kinds of task-specific all-male or all-female groups associated with Binford's "collecting" strategy.

At least for the early Archaic periods in Tehuacán, such as El Riego and Coxcatlán, MacNeish's reconstruction of the settlement pattern would fit Binford's description of foragers—people who made residential moves in search of resources and adjusted their group size between microband and macroband. MacNeish's original suggestion was that macrobands probably coalesced in the rainy season when plant foods were abundant, then dispersed as microbands during the dry season.

Now the sites we have found in Oaxaca can be added to those from Tehuacán (see Fig. 3.5), providing a larger sample and making it clear that there are even more settlement types than we had originally thought. We would still see the Naquitz phase as a time of foragers who "mapped onto resources through residential moves and adjustments in group size," but we now believe it would be a mistake "to assume a simple correlation between macrobands and the rainy season, microbands and the dry season. In a bumper year for mesquite, the macroband coalescence might take place on the alluvium in July; in a bumper year for acorns, it might take place in the upper piedmont during November. During a drought year, there might never be an opportunity for macroband settlement" (Flannery 1983:33).

GUILA NAQUITZ IN THE CONTEXT OF OAXACA-TEHUACAN SETTLEMENT TYPES

In 1983 I presented a five-part settlement typology for the Oaxaca–Tehuacán area (Flannery 1983), which is reprinted here as Fig. 3.6. As more sites are found and excavated it is likely that this typology will need modification, but I will recapitulate it here in order to place Guilá Naquitz in perspective.

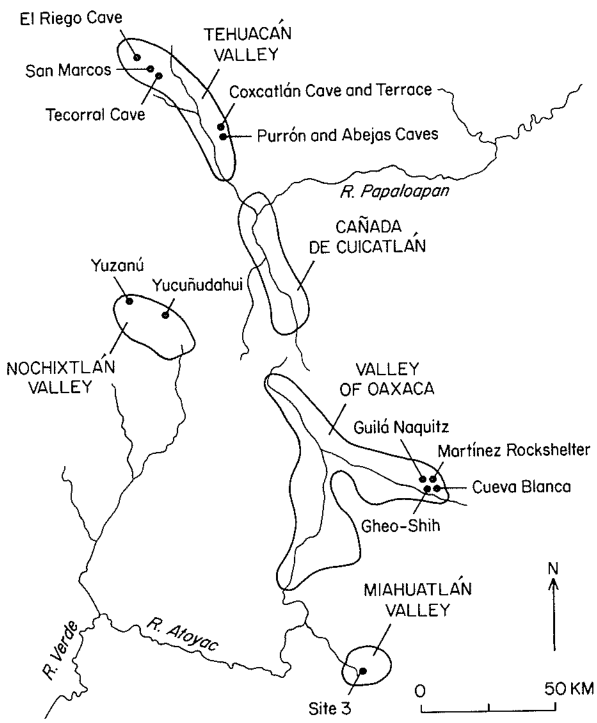

FIGURE 3.5. The Valleys of Tehuacán, Cuicatlán, Nochixtlán, Oaxaca, and Miahuatlán, showing excavated preceramic sites and important preceramic surface finds.

1. The site of Gheo-Shih would be an example of a macroband camp in the Mitla region. Gheo-Shih covers 1.5 ha and might have been occupied by 25 persons, probably during June–July–August when the valley-floor alluvium was experiencing peak mesquite pod production, and when rainy-season cultivation of early domestic plants could take place. There are oval concentrations of rocks and tools that may indicate residence in small shelters or windbreaks, and a boulder-lined area that may have been used for ritual or public activity. Gheo-Shih will be the subject of a future site report.

In the Tehuacán Valley, Coxcatlán Cave and Coxcatlán Terrace (MacNeish *et al.* 1972) would be examples of macroband camps.

2. Zones E–B1 at Guilá Naquitz (the focus of this volume) represent a series of microband camps in the upper piedmont; they contain both men's and women's tools. We reconstruct these levels as living floors left by families of 4–5 persons who arrived toward the end of the mesquite harvest season (late August or early September?) and stayed until the end of the acorn harvest (late December?). While the group did a little hunting, their most important activity was probably the harvesting of many species of wild plants. The microbands who camped in Guilá Naquitz may have done so after the breakup of a macroband camp somewhere else or may have done so in years when no macroband camps were possible. They were foragers in Binford's sense, and family collecting bands in Steward's and MacNeish's sense. Thus, they tell us only about autumn activities in the Mitla region and only about one of many adjustments in local group size.

In the Tehuacán Valley, levels 4 and 5 of El Riego Cave (MacNeish *et al.* 1972) were probably left by the same kind of family microbands whose major focus was wild plant harvesting.

3. Zones D and C at Cueva Blanca also represent microband camps in the Mitla region, but they seem to have been oriented more heavily toward hunting than were Zones E–B1 at Guilá Naquitz. Projectile points and deer bones were relatively well represented, while grinding implements were rare. At this writing, we have not yet decided whether these Cueva Blanca occupations represent all-male deer-hunting camps indicative of "logistically organized hunting" in the San Bushman sense (or Binford's "collector" sense) or whether they are family microband camps with a strong hunting focus. Cueva Blanca will be the subject of a future site report.

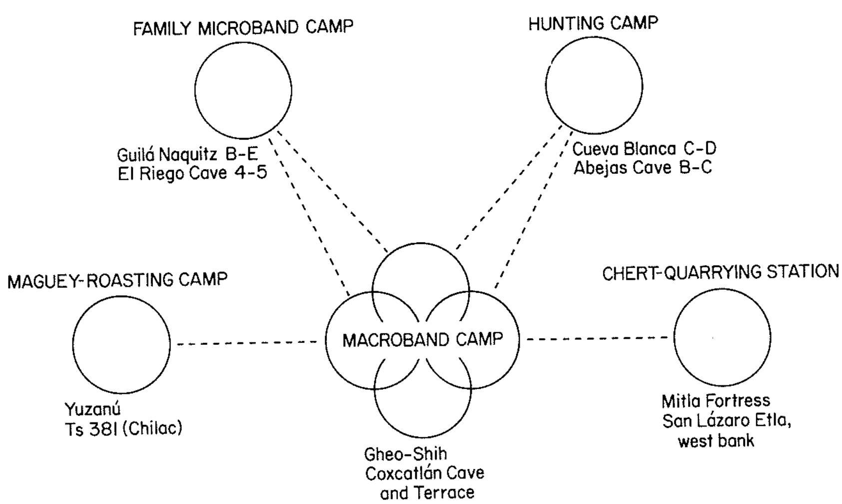

FIGURE 3.6. Model for the hypothetical integration of five preceramic settlement types in the Oaxaca-Tehuacán area. Each circle represents a microband in MacNeish's terminology. Two archaeological examples of each settlement type are given.

In the Tehuacán Valley, Zones C–B of Abejas Cave (MacNeish *et al.* 1972) also represent this kind of hunting-oriented microband camp.

4. In the heart of the dry season (e.g., February) there are too few plants available in the Guilá Naquitz area to keep a family alive, and often the deer have moved up to the higher mountains where the lower evapotranspiration provides them with more to browse on. One of the activities of this lean season is the roasting of maguey, some mature specimens of which are available at all times of the year. The heart of the maguey was roasted in large rock-lined pits or earth ovens, which show up at numerous maguey-roasting camps. I believe that the large roasting pit found by Lorenzo (1958) at Yuzanú near Yanhuitlán, Oaxaca, is an example of such a feature. In the Tehuacán Valley, the west half of Site Ts381 near Chilac (MacNeish *et al.* 1972) has a maguey-roasting pit assigned to the El Riego phase. Similar features are in evidence along the cliffs near our excavations at the Martínez Rockshelter, a site that will be reported in a future publication. I expect most (but not all) maguey-roasting camps to date to the dry season and to be found at elevations above the valley floor.

5. A fifth type of site, not considered a true camp, was the flint- or chert-quarrying station. In the Mitla region, perhaps the most prominent quarry occurred on the slopes of the so-called Mitla Fortress, described by Whalen in Chapter 7. Here surface finds of preforms and unfinished projectile points indicate that preceramic knappers frequently visited the veins of silicified volcanic tuff exposed on the Fortress. In the western Valley of Oaxaca, similar evidence can be found around a chert outcrop on the west bank of the Río Atoyac near San Lázaro Etla. Farther to the north, limestone outcrops on Yucuñudahui mountain in the Nochixtlán Valley have also produced preceramic projectile points (Ronald Spores, personal communication, 1975).

This brief discussion makes it clear that Guilá Naquitz belongs to only one of several preceramic settlement types in the Mitla region. Further complicating this situation is a still-unresolved question that arises from the chronological differences among the sites. Gheo-Shih, Cueva Blanca, and Abejas Cave B-C are all more recent than the Naquitz and El Riego phases. This raises the possibility (discussed in Chapter 32) that the foraging strategy of the early Archaic, with its family microbands, was gradually transformed into a collecting strategy with logistic microbands in the late Archaic. If this happened, I would expect to find more permanent-looking macroband camps and more all-male or all-female microband camps in the late Archaic. To date, our sample of excavated sites is probably too small to show this conclusively, but it is worth thinking about. It would certainly do no violence to the sequence of sites that have been excavated in Oaxaca and Tehuacán.

SUMMARY

One of the research goals of the Oaxaca Project was to better understand the transition from foraging to agriculture. Guilá Naquitz contributed to this goal by providing us with six living floors of the Naquitz phase (8900–6700 B.C.). This falls squarely within the period 10,000–5000 B.C. that we identified in Chapter 1 as crucial for the origins of agriculture worldwide.

To understand how the occupants of Guilá Naquitz used their prehistoric environment, we have considered the cultural context of that period. This was a time when the inhabitants of the Oaxaca–Puebla highlands were making the transition from a Paleoindian to an Archaic way of life. They lived mainly on wild plants and animals, although minor evidence for plant domestication appears before the end of the Naquitz phase. They lived in temporary camps, moving from place to place as the harvest seasons changed. Sometimes, when resources permitted, they coalesced into groups of 25–30 individuals; at other times, they fragmented into family groups of 3–5 persons. The Mitla area contains examples of several types of preceramic sites—caves, open-air sites, microband and macroband camps, summer and winter occupations—and we cannot understand Guilá Naquitz without considering the larger settlement system of which it was only one component. It would appear to have been an autumn camp, occupied for perhaps 4 months by a family of 4–5 persons.

One way to visualize the situation is this: Imagine a 2200-year period during which the climate of the Mitla region goes through phases when it is somewhat warmer or somewhat cooler, somewhat drier or somewhat moister. Imagine the primary vegetation zones shifting upslope or downslope in response to these phases; sometimes the oaks descend below Guilá Naquitz, sometimes they withdraw to higher slopes. Outside, a small population of Indians moves through the area as the seasons change, sometimes nucleating to take advantage of a localized bumper crop and sometimes dispersing to exploit more widely scattered resources. On six occasions during that 2200-year period, you notice people in Guilá Naquitz Cave and you press the shutter of your camera: six snapshots, one for each preceramic living floor. They would be interesting photos, but each would represent only an instant frozen in time. None would really do justice to the dynamic processes of long-term cultural and environmental fluctuation, made to look so stable and eternal by your pressing of the shutter.