6. The Settlement and Its Architecture

MARY PRINDIVILLE and DAVID C. GROVE

There are several sets of data useful in reconstructing the nature of the settlement at Chalcatzingo. The most important of these are the residential and public architectural features and their distribution across the site. In this chapter the residential and public structures are described and discussed separately, and then the data are combined to provide an overall view of the site during each major cultural phase.

PUBLIC AND SPECIAL ARCHITECTURE

Early and Middle Formative period mound architecture is virtually unknown in central Mexico, and it was unreported at Chalcatzingo prior to this project. However, eight structures at the site, ranging in time from Amate to Cantera phase, can now be identified as public and/or special architectural constructions. These architectural features differ greatly from the site's residential structures in form, construction, and presumably also in function. The basic details of these structures, as well as the residential structures, have been presented in Chapter 4. Here they will be discussed in the context of the settlement.

Public Architecture

PC Structure 4

The largest and most visible architectural construction at Chalcatzingo is PC Structure 4, a 70 m long earthen platform mound forming the northern edge of the Plaza Central (T-1) terrace. The north side of this mound rises nearly 8 m above the surface of T-15 (Fig. 6.1). The platform mound is one of the few structures at the site which can clearly be identified as public architecture. Its five discernable construction stages, four of which range from Amate to Cantera phase, indicate that the mound, and by implication the Plaza Central terrace as well, was important throughout the site's history.

The earliest construction (Stage a; Figs. 6.2, B.18 level 6) is an earth and clay mound with stone facing on its lower sides. This structure, which apparently dates to the Amate phase, is over 15 m long (in the profile cuts) and 2.2 m tall. A further Amate phase rebuilding (Stage b) added another 2 m of height and perhaps enlarged the structure to the south with a further stone construction. A stone pavement extended at least 30 m southward from the mound.

No clearly identifiable Barranca phase building stage was found in our limited mound excavations. However, the proximity of the mound to Barranca phase PC Structure 5 implies a continued importance of the Plaza Central and PC Structure 4.

Building Stage c is difficult to date due to the limited data yielded by the few pits excavated into the mound. While probably Late Barranca phase, it may actually encompass several rebuildings. Stage d represents one or more Cantera phase rebuildings. Because our tests were limited to one restricted area of the mound, they do not provide data on the structure's east-west development. A fifth building stage (e) during the Classic period added a pyramid structure (T-3 Structure 1), an area of pavement, and some ball court construction to the mound's west and northwest sides (see Chapter 24). Nevertheless, the platform as it appears today is primarily the Late Cantera subphase (Stage d) configuration.

The mound today is over 70 m in length (east-west) and may be nearly as wide (see Chapter 4 for an explanation of the problems in determining the true size). It rises 5 m above the base of the original Amate phase (Stage a) mound. The upper surface (Stages d and e) covers an area of over 2000 m^2.

Our archaeological data indicate at least two functions served by the mound. First, it served as a substructure for carved stone monuments. There is no doubt that one carving, and possibly more, stood on the upper surface of the Late Cantera subphase platform. Monument 9, a large rectangular slab with a bas-relief earth-monster face (Chapter 9), was uncovered by looters on the mound's northern edge. Our excavations revealed several large faced stone blocks (MCR-5, -6, and -7; Chapter 11) on the upper east end of the platform, and fragments of several similar blocks lie beside the path which crosses the structure's east end (Fig. 6.3). From their location today it can be inferred that these latter large worked stone blocks had once been positioned atop the platform's upper surface, although their configuration is unknown. The possibility must also be considered that Monument 16, originally found by Guzman on the west (T-15) side of the El Paso Drainage, slightly downhill from PC Structure 4, was also originally placed on top of the platform.

A second definite function for the Late Cantera subphase platform was that of burial location for the community's highest ranking individuals. These are exemplified by Burials 39 and 40 (Chapter 8), the only known individuals interred at Chalcatzingo wearing jade jewelry. Our excavations also revealed a looted tomb and a crypt within the platform (Chapter 4, Figs. 4.9, 4.10).

A third possible function for the mound remains untested, namely, that it served as the foundation for public buildings. Classic period disturbances and recent plowing of the upper surface may make it difficult to ever test this possibility.

PC Structure 6

A house-like structure, PC Structure 6 is located at the southeast edge of the PC Structure 4 platform (Figs. 4.11, 4.12). At this time, it is difficult to ascertain what relationship this Cantera phase structure

Figure 6.1. PC Structure 4 mound, with T-3 Structure 1 pyramid.

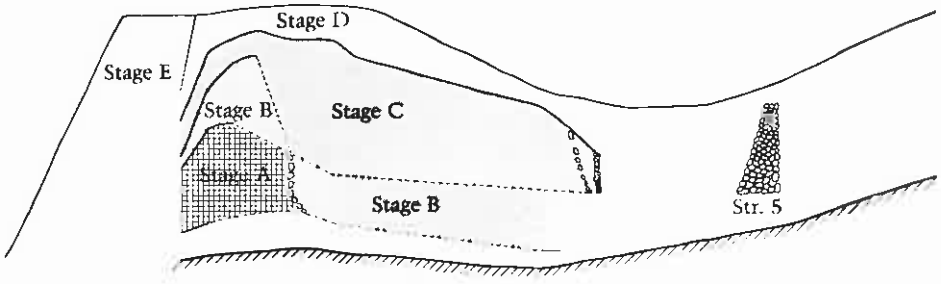

Figure 6.2. Profile drawing of PC Structure 4 construction stages; PC Structure 5 to the right.

Figure 6.3. Large worked stones at the eastern end of PC Structure 4.

had with the mound and its function. It is possible that Structure 6 was a public building functionally related to activities on the platform, but it is tentatively being categorized as a house structure (see below).

PC Structure 5

The only Barranca phase structure at the site identifiable as public architecture is PC Structure 5, an all-stone and apparently free-standing mound 18 m south of PC Structure 4. Because this structure was assigned low priority at the time of its discovery in the PC transect trench, it was not completely excavated, and therefore its exact dimensions remain unknown. It is approximately 2.7 m in height, 5 m in width (N-S) and over 13 m in length (E-W), although its western extremities are badly damaged. The structure's profile, complete with a long sloping northern face, is reminiscent of ball court ranges. PC Structure 5 is parallel to the PC Structure 4 platform, and is probably contemporaneous with Structure 4c. The sloping earth and stone construction stage on the platform (Fig. 6.2) does appear to be very similar to that of Structure 5 in size and profile, but the actual association between the two structures is uncertain, and their similarities and ball court–like appearance may be coincidental. Their exact stratigraphic relationship remains undetermined. The sloping Structure 4c face is covered with a later rebuilding which slopes downward to end at a vertical stone wall, which also has its base at the Structure 5 level (Fig. 6.2). Two inferences can be made from this later construction: first, because it sits at the same elevation, the area between the two structures was level in the past; second, the building of the vertical stone wall destroyed any real or coincidental symmetry. The identification of PC Structure 4 and 5 as related to a Barranca phase ball court remains to be settled by future archaeological investigations.

Platform Architecture

We hesitate to characterize the five known stone-faced platforms as public architecture because their exact function remains uncertain. Because they are raised platforms, they are obviously special. But it remains to be determined whether they were truly public architecture in the sense of being substructures for public buildings, or if special residences were constructed on them. Although the upper surfaces of most of

them lie within the plow zone and remnants of possible superstructures have long since been destroyed, there are data which suggest that at least some of the structures may have had a residential function. It is likewise significant that three of the five platforms have associated stelae, and this perhaps assists in assessing the character of these constructions.

T-6 Structure 3

The earliest of the platform constructions is T-6 Structure 3, an Amate phase platform only partially exposed during a brief field season in 1976 (Fig. 4.18). Because the structure lies well below the plow zone and its upper surface may be undisturbed, we did not attempt to clear the platform in the short excavation time available but left it virtually untouched for future research. Only 4 m of the platform's eastern side was exposed, revealing a facing of field stones ca. 1 m in height. This platform and PC Structure 4 (Stages c and d) represent the earliest monumental architecture known at Chalcatzingo and some of the few examples reported in central Mexico.

T-6 Structure 1

The remaining four platforms are all Cantera phase constructions. The largest and most impressive of these also is located on T-6 (Str. 1), a few meters east of its Amate phase counterpart. The platform's outer face, 15.7 m long with sides ca. 3 m long, rises in two stages (Fig. 6.4), 80 cm and 50 cm in height, and represents the final form of apparently many rebuildings. The wall of the stepped second stage of the platform is also the front wall of the previous platform, with only its upper 50 cm exposed today. Other possible wall lines to the rear may be walls of earlier structures. Our excavations did not reveal a definite back wall to the platform; thus it may have been three-sided rather than a definite rectangular construction.

T-6 Structure 1 is important not only because it is a large stone-faced platform mound, but also because it is one of the few Middle Formative period structures in Mesoamerica to have a stela (Mon. 27) standing in situ in front of it. The stela, carved in bas-relief, is described in Chapter 9. Grove (1981b) believes that stelae such as Monument 27 are portrait representations, most probably of a site's chief, and that the monuments in some way commemorate those individuals. If this assumption is true, then the three platforms at Chalcatzingo with stelae in association (see below) are probably not generalized "public architecture" but are in some manner associated directly with the personage portrayed. The (possible) superstructure on the platform may have served as a residence of that personage, or as a public building used by the personage and/or his or her lineage. Likewise the entire terrace may have had a similar association with the person or lineage.

T-15 Structure 5

A platform (Str. 5; Fig. 4.27) sits near the northern edge of T-15, overlooking T-27. It is in relatively poor condition. While its length can be determined as 19.5 m, its width is uncertain, since our limited excavations concentrated on the slightly sloping front face. This face, like the other walls, is constructed of unfaced field stones and river cobbles, and varies in height from 70 to 100 cm.

Monument 21 once stood in front of this raised platform, and its original location can be determined by the stone cluster which once surrounded this now-fallen stela. This stela is important in that it depicts a female personage. Its implications are discussed in Chapters 10 and 27.

T-25 Structure 2

The third and final platform with an associated stela is T-25 Structure 2 (Fig. 7.23), a Late Cantera subphase construction which postdates the T-25 altar and patio area (see Chapter 7). The structure is 16.5 m long, 4.5 m wide, and ca. 50 cm tall. Unlike the platforms described above, it is clearly a low, raised rectangular platform, i.e., it is four-sided. It is further distinguished from the other platforms in that its associated stela (the basal stump of Mon. 23) is located by the rear of this platform's southwest corner instead of standing at the "front" (north, downhill) face of the platform.

Daub and amorphous adobe chunks imply the presence of a superstructure on the platform, and two Cantera phase trash areas suggest that the superstructure may have been a dwelling. However, the raised platform and associated stela also serve to identify this structure as special and distinct from the site's regular residences.

T-27 Structure 1

The platform excavated on T-27 (Str. 1; Fig. 4.33) is like T-25 Structure 2 in that both are definitely rectangular raised platforms and in form are more like

Figure 6.4. T-6 Structure 1 with broken stela (Mon. 27) in situ (wall in background built by project to protect the structure and stela).

raised house foundations than T-6 Structure 1 or T-15 Structure 5. T-27 Structure 1 is 18 m long and 7.5 m wide. There is evidence that the platform's original height may have been over 1 m and that erosion and plowing have reduced its height today to ca. 70 cm. Incomplete wall lines within the structure suggest that there have been several building stages. Daub and amorphous clay fragments recovered in the excavations provide evidence of a superstructure. However, no trash pits were located, nor is there evidence of a stela or other monuments on this terrace.

Other Special Architecture

T-29 Structure 1

An architectural construction which is difficult to categorize is the Barranca phase wall complex which projects northward from the upper edge of T-29 (Str. 1; Fig. 4.35). This structure apparently served as the foundation of a small artificial "terrace" ca. 20 m long and 5 m wide which jutted over the sloping T-29 hillside.

As is so often the case at Chalcatzingo, the structure's upper surface has been stripped away by erosion and plowing. The only evidence that this small terrace may have supported a structure are the fragments of clay daub and amorphous clay lumps found in the excavations. Because of the destruction of the upper surface, there is no way to ascertain the function of the presumed superstructure as a public or residential building.

T-29 Structure 1 is a Late Barranca subphase construction. On its southern side it extends slightly on to T-25 (Fig. 4.2). It perhaps can be taken as evidence of an expanding population and the need for some flat area on T-29 on which to construct a building (of whatever function). Or the construction can conversely be viewed as an expansion of T-25, perhaps related to activities involving the altar (Mon. 22) which played such an important role on T-25 during the Cantera phase.

Comments

Mound architecture and the kinds of special structures discussed above are generally unknown elsewhere in central Mexico. A few mounds and platforms, perhaps Middle Formative in date, have been reported at Cuicuilco (Heizer and Bennyhoff 1972:97–98), and a circular stone-faced Early Formative structure was identified at San Pablo in southern Morelos (Grove 1970b). It is this rarity that makes Chalcatzingo's structures so important.

Although it was limited during the Early and Middle Formative in Mexico's central highlands, public architecture was becoming more abundant to the south at this time. Adobe platforms occur at San José Mogote, Oaxaca, in the late Early Formative and Middle Formative. The late Middle Formative Rosario phase at that site includes a large plaza flanked by low platform mounds, with an elite residence at one end of the plaza and a major mound at the other end (Flannery and Marcus 1976a). Further south, both coastal and highland Chiapas have Middle Formative sites with mound architecture arranged around plazas (Lowe 1977:224–226).

Early Formative architecture at Gulf Coast Olmec centers is poorly known, but the record from Middle Formative San Lorenzo and La Venta is impressive. The rectangular plaza and its long flanking platform mounds appear to have been major architectural features at both sites (Coe and Diehl 1980:29, 388, Map 2; Diehl 1981; P. Drucker, Heizer, and Squier 1959:Fig. 4). Most of these structures seem to be earthen, but adobe brick construction and some minor use of stone facing occurs with the La Venta Complex A mounds (P. Drucker, Heizer, and Squier 1959:80, Figs. 25–28).

Chalcatzingo shows no close parallels to either the Oaxacan or the Gulf Coast architecture except in one regard. All three areas have major Middle Formative public architecture in the form of long earthen platform mounds. The upper area of the PC Structure 4 platform was the location of monumental stone carvings and the burials of high-ranking individuals. Whether such functions likewise were related to the Gulf Coast platform mounds (in particular) remains to be answered by future research.

HOUSE STRUCTURES

Sixteen incomplete structures, the majority of them apparently houses, were excavated by the project. Eleven of these date to the Cantera phase, two to the Barranca phase, two were Classic, and one was Postclassic. While the raised stone-faced platforms previously discussed may have been substructures for residences, only Formative period structures with ground level foundations will be dealt with here.

Most of Chalcatzingo's terraces have one restricted area which is heavy in Cantera phase sherds. The project's investigations into residences and residential patterns focused attention on these sherd concentrations, which were hypothesized to represent house debris and to be surface indications of houses.

Random sampling, such as was carried out in Oaxaca by Marcus Winter (1972) at Tierras Largas, was not used as a primary means of locating houses, since the project's approach was to maximize the data yield, and a Cantera phase structure was virtually assured each time a terrace's sherd concentration was excavated. This approach, on the other hand, clearly provided a sample biased in favor of Cantera phase structures. Structures with low ceramic associations or lacking surface indications may have been neglected because of this strategy.

During the excavation of structures, the major time and effort were directed to the area within the structure's foundation walls (the interior), and excavations were seldom expanded any great distance to the outside. This sampling technique may have missed features external to the main structure. A testing program was conducted on T-23 to check for features external to the houses and for other possible structures missed through the sampling biases (see below).

A basic problem encountered during the excavation of structures was simply the destruction and/or lack of preservation of the house remains. As mentioned previously, the terraces of Chalcatzingo have suffered the effects of heavy erosion. At the same time, alluvial redeposition (from higher areas on the site) has taken place. These two forces have apparently equaled each other, and over most of the site the modern surface is essentially at the same level as the Cantera phase surface. This means that Middle Formative house structure remains (walls and floors) lie within the modern plow zone, and what has not been destroyed by erosion has become the victim of the yearly plowing and planting.

No complete Cantera phase dwelling was recovered. The foundation walls have been at least partially scattered, the floors plowed away, and any artifact patterns destroyed. As will be mentioned, however, some of this destruction probably took place during the Cantera phase as well. Thus, the descriptive data presented in the following pages are generalized from all of the structures.

House Construction Size

A major feature setting Chalcatzingo's Cantera phase house structures apart from other reported Middle Formative period houses is size. The estimated average floor area within a Cantera phase house is 63 m^2, more than twice the area of other known Mesoamerican dwellings (e.g., Flannery 1976a).

Archaeologists have attempted to use house floor area as a means for estimating the number of people who inhabited the structure. Unfortunately, there is lack of agreement as to the appropriate figures to use for these calculations. Raoul Naroll (1962) suggests a figure of 10 m^2 per person. This estimate seems too low to other investigators (e.g., LeBlanc 1971:211; Winter 1972:166). Using Naroll's "low" figure would provide an estimated household population of six to seven individuals. Estimates of this type, when based upon household floor area, rest on the assumption that the entire structure functioned as a residence. That assumption has not been demonstrated for Chalcatzingo's Formative period houses (see below).

T-9B Structure 1 is the only Barranca phase house for which any good data are available. Its floor area, ca. 27.5 m^2, is considerably smaller than that of Cantera phase structures. If this house, which is Early Barranca subphase in date, is typical of the phase as a whole (and the fragmentary N-2 house suggests T-9B Structure 1 should not be considered typical in terms of construction), then there was a substantial increase in average house size between Early Barranca and Cantera phases.

Walls and Wall Foundations

Two types of stone foundation walls are characteristic of Late Cantera subphase houses. They are typically found together in the same house structure and seem distinctive enough to serve to differentiate Late Cantera subphase walls from those of other periods.

One type of foundation wall is characterized by an alignment of small cobbles (ca. 20–40 cm diameter). Although these walls can be up to three rows in width, a single row is the common practice (Fig. 6.5). These foundation lines appear to correlate with wattle and daub wall construction. Norman Thomas (1974:7, Fig. 5), using ethnographic examples, shows that such stone lines are usually placed at the base of wattle and daub walls to retard erosion. Our excavations did not find any postmolds or wall trenches adjacent to the stone lines, but daub fragments were often recovered.

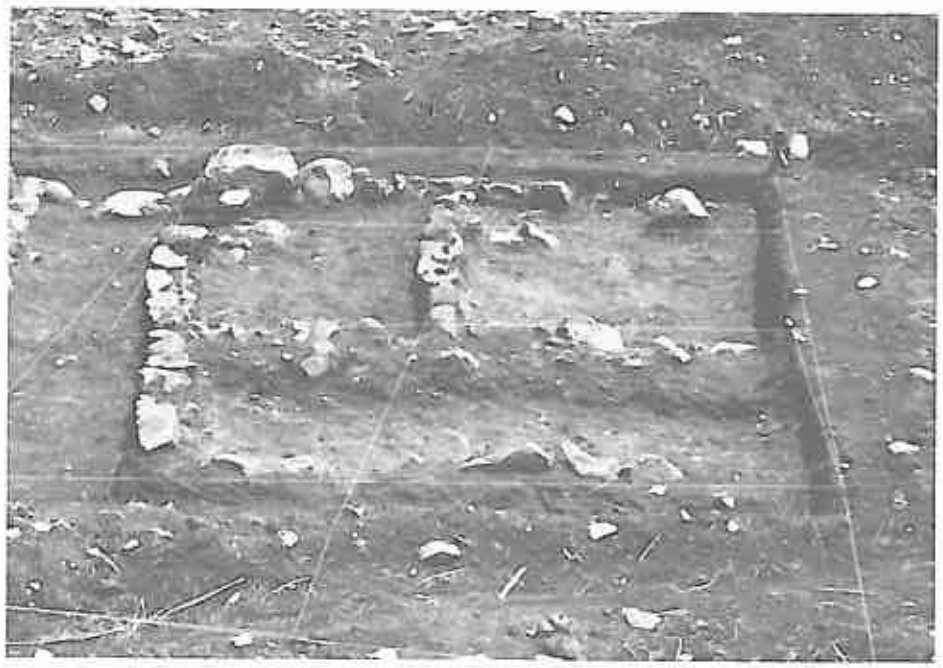

Figure 6.5. Wall line composed of a single row of stones, PC Structure 2.

The second and more common foundation wall type is constructed of large (50–80 cm) stones laid to present a relatively flat upper surface (Fig. 6.6). This larger and heavier foundation seems to have served as the base for adobe brick walls. There are three variations to this wall type: (1) one row of large stones edged on both sides by smaller cobbles; (2) one row of cobbles edging a row of large stones; and (3) a double row of large stones. This last variation is often two courses high.

The data strongly suggest that both wall types appeared together in Late Cantera subphase houses. PC Structure 1d has two foundation walls built of large stones, indicating that these supported adobe brick walls. The missing north wall is presumed to have been of similar construction. The west wall line, largely destroyed, was constructed of small stones, implying that the wall was of wattle and daub. Numerous associated burned daub fragments support this assumption. Data available from other Late Cantera subphase house remains confirm that the common construction pattern must have been three walls of adobe brick and a fourth wall of wattle and daub. A possible exception to this is PC Structure 2, which may have had only wattle and daub walls.

According to an informant from the village, present-day weather patterns bring cold, rain-laden winds and storms from the northeast, while winds during the hot dry season originate from the southwest. For that reason the east sides of houses today are constructed of heavy adobe brick walls to block the cold and rain, while more open walls on the west side catch breezes during the hot months.

Unfortunately, most excavated houses were not complete enough to ascertain the entire wall pattern (see Chapter 4 maps). However, several good examples, such as PC Structure 1d, T-23 Structure 1b and c, and T-4 Structure 1, all seem to have their long adobe-walled sides (as ascertained by stone wall foundations) oriented toward the north and east (against the cold rains) and their more open sides facing westward.

T-23 Structure 1b was the only house in which firepits were discovered. The firepits were located in the vicinity of the wattle and daub wall (its hypothesized location), suggesting that this side of the house was at least partially open for ventilation purposes.

The remnants of an Early Cantera subphase house floor with 3.5 m of wall base remaining (PC Str. 1a) were found at 140 cm below PC Structure 1d. In contrast to the Late Cantera foundation walls, this wall was constructed of a double row of irregular cobble-sized stones. Five post-

Figure 6.6. Wide foundation wall line, PC Structure 3.

Figure 6.7. T-9B house excavations showing wall line boulders protruding into plow zone.

molds were found within this foundation, showing the upper wall to have been of wattle and daub (other data indicate this as well).

The Barranca phase structures found on N-2 and T-9B likewise show different foundation construction techniques. The T-9B house is outlined by a wall composed of large stones set side by side but not laid out to create a flat upper surface. The impression given is simply of stones set side by side (Fig. 6.7). The wall is single in some areas and double in others (Fig. 4.20). Within the structure apparent room areas are also delimited by rows of the irregular large stones. On the other hand, the few segments of walls remaining of the N-2 structure were single rows of small cobble-size stones (Fig. 4.37). Both the T-9B and N-2 structures were probably of wattle and daub, since daub fragments were found in the excavations of both areas and no regular stone foundations occur.

The only further point of comparison that can be made is with a segment of a Barranca phase wall uncovered in the Plaza Central cross trench. This wall, which sits upon *tepetate*, is constructed of large stones in the manner of the T-9B walls. It is highly possible that foundation wall construction changed during the Barranca phase, and the T-9B and N-2 walls may be reflections of these differences, the N-2 walls being far more similar to those of the Cantera phase.

Three types of evidence were found relating to the construction materials of the upper walls: adobe bricks, amorphous adobe chunks, and daub fragments. There is strong evidence for the manufacture and use of rectangular adobe bricks during the Cantera phase. One unusual and surprising set of evidence comes from Cave 4, high on the western face of the Cerro Delgado, where excavations revealed a Cantera phase artificial floor of adobe bricks (Fig. 4.39). Rectangular adobe bricks were also found in our regular excavations, including a complete brick recovered from T-23 Structure 1a.

A second type of artifact which serves as evidence of the use of adobe bricks is the large and often amorphous chunks of adobe recovered during house area excavations. These chunks lack plant impressions (so common in daub). An obvious problem in identifying adobe bricks is that they are only sun dried and tend to "melt" if exposed to rain. In some instances these melted bricks can be identified as such, while at other times they may simply appear as amorphous lumps.

While some Cantera phase bricks were

made of pure adobe clay, our data indicate that others were manufactured around a core of *tepetate*, or were tempered with pieces of *tepetate*. Older villagers at Chalcatzingo remember when such techniques were used in adobe brick making several decades ago. While lacking cane impressions, recovered adobe chunks had grass impressions and, in addition to *tepetate*, inclusions of charcoal fragments, pieces of burnt clay (daub), and sherds. Some chunks in our sample have finger impressions left during the manufacturing process. The presence of charcoal, daub, and sherds within adobes suggests that they were manufactured from soil gathered near dwellings as opposed to the practice today of gathering the soil outside of the village. The implications of this hypothesis are discussed below.

The mud plaster or daub placed over the cane sides of the houses is easily identified when found in archaeological contexts because of the cane impressions left in the mud fragments (Fig. 6.8). At Chalcatzingo the impressions serve to identify the cane as *Tithonia tubaeformis* of the Compositae family. These plants are abundant along field borders and the hillslopes of Chalcatzingo. Today, as in the past, their tall stems are often as thick as a human thumb.

Most daub fragments show only one row of canes. However, some thicker fragments (ca. 20–25 cm thick) appear to have covered a double row. Daub fragments with concave corners demonstrate that structures were plastered not only on the outside but on the interior as well. Some fragments also show the plastering to have curved down from the wall and onto the floor area. This is confirmed by the mud plaster found in situ at the floor-wall junction of PC Structure 1a.

It is important to mention that the majority of the daub fragments recovered were at least partially hardened by heating. This, along with other data, indicates that those structures had burned at one time.

Traces of white pigment were found on the outer surfaces of many Cantera phase daub fragments, showing that the structures had been painted. Tests with hydrochloric acid indicate that the white pigment is not a lime (calcium) based paint. It is highly probable that the pigment is kaolin clay. A kaolin source exists very near to Chalcatzingo (Chapter 23) and was apparently exploited during the Middle Formative.

Figure 6.8. Daub fragments in situ, T-23 Structure 1.

Daub fragments are occasionally found adjacent to the stone foundation lines which we believe supported adobe walls. It is possible that the daub fragments became scattered throughout the structure during its burning, destruction, and the subsequent removal of the debris. The possibility must also be considered that portions of these walls were also wattle and daub; the adobe wall may not have run completely from floor to roof, but could have been topped by a wattle and daub section. We prefer the former explanation.

Roofing

No good archaeological evidence was found to indicate the type of material used for roofing the Cantera phase house structures. Occasional daub fragments with grass rather than Compositae impressions could be from wall areas adjoining a grass-thatched roof, but may also simply be from grass growing along the base of the wall and accidentally caught up during plastering. Both grass and Compositae are abundant on the site. They may have been used together as roofing material, or grass thatch may have been used alone.

Floors

House floors were rarely preserved at Chalcatzingo. Although we were able to distinguish three different types of floors within Cantera phase structures—(1) dirt with a subfloor of small stones, (2) hard-packed dirt with no subfloor layers, and (3) mud plaster—in most instances the house floors could not be identified. For example, although we knew exactly where the floor in PC Structure 2-1 should have been because we had a preserved burned section present, no floor could be identified even immediately next to the preserved floor area. It is quite possible that in many instances the house floors were purposely destroyed. Data leading to this hypothesis are presented in the discussion of house destruction, below.

Room Differentiation and Activity Areas

Interior walls within several house structures provide evidence that both Barranca and Cantera phase houses were divided into rooms. These walls were probably of mud-plastered cane, since Compositae-impressed daub fragments were found near the junction of two interior walls of T-9B Structure 1. In a few instances, minor variations in artifact patterns among the different rooms can be ascertained, allowing some speculation as to room use and activity areas.

Three room areas can be differentiated within the Barranca phase structure T-9B

Structure 1 (Fig. 4.20). Room 1 runs the entire length of the house's west side. Obsidian fragments and core flakes within this room indicate that obsidian working or an activity requiring obsidian tools was conducted here.

An area of burned earth is found midway in the room, near the threshold stone marking the door to Room 2. No ash or carbon was associated with the feature. We cannot assume that this area of burned earth is a hearth, especially since hearth features, either as firepits or raised hearths, are rare at Chalcatzingo. However, all house structures contain brazier fragments, and those at T-9B Structure 1 are found in rooms other than where the burned earth was found.

These braziers are apparently cooking braziers and were the common means of cooking during the Barranca and Cantera phases. Brazier fragments are frequently found in association with charcoal flecks in the surrounding soil. These braziers are unusual in that the tripod supports which serve to hold vessels above the coals are zoomorphic (Fig. 13.68).

Rooms 2 and 3 of the structure contain ceramic vessels, both whole and broken, found on or slightly below the estimated floor level (apparently destroyed by plowing). One vessel was found within the exterior foundation wall of Room 2. Both Rooms 2 and 3 lack the quantity of obsidian found in Room 1, implying that they functioned for activities such as sleeping or storage, or for activities which required constant cleaning. The presence of vessels in these rooms tends to imply a storage function.

While it is not certain that the PC Structure 2 complex had residential functions, it, too, is clearly divided into separate room areas. Three rooms occur in Structure 2-1 and at least two more in Structure 2-2. Room 2 of Structure 2-1 (Fig. 4.7) is the largest of the identifiable rooms. It may even have contained a small partition wall at its western end. The only subfloor burials (nos. 41–50) in the PC Structure 2 group are located beneath Room 1.

Obsidian cores were found in Rooms 2 and 3. Rooms 1, 2, and 3 all contained in the room fill a scatter of both worked and unworked jade fragments and drill cores. Room 4 had two anthropomorphic heads from cooking braziers, and a scatter of charcoal. These latter artifacts indicate a possible cooking function for this room.

The data from the PC Structure 2 complex suggest that workshop activities were carried out here. The presence of subfloor burials and the fragments of cooking braziers indicate a possible residential use as well.

T-23 Structure 1 represents the intermixed remains of at least three Cantera phase houses (essentially rebuildings of the same structure). Each rebuilding destroyed portions of the previous structures, and Classic period intrusive features further complicate the interpretations (Figs. 4.30, 6.9–6.11).

Only the southern portion of T-23 Structure 1a, the earliest of the three houses, is preserved (Fig. 6.9). Three probable room areas can be defined by the presence of interior walls 12 and 13. Two complete vessels, as well as fragments of hollow ceramic spheres and an obsidian "blood-letter," were found on the "floor" of the westernmost room (Room 1). The 4 m wide middle room (Room 2) still has a stone subflooring present in some areas. There is one subfloor burial (no. 80), and two manos and an obsidian scraper were found at the approximate level where the floor should have been. The eastern room (Room 3) lacked stone artifacts. In the area where the northern end of the house once existed, excavations uncovered obsidian workshop debris including cores, blades, and debitage. The overall distribution of artifacts for Structure 1a suggests domestic activities (vessels and grinding stones) in the area where wall remains still exist and workshop activities in the area immediately to the north.

The second of the three structures, Structure 1b, is somewhat more complex, with two east-west walls, a small raised "platform" structure on the east side, and one probable room partition (Fig. 6.10). While there may be two structures here, possibly even structures with different functions (due to the small, low platform), we cannot unequivocally classify them as separate and thus are tentatively considering them together.

The structure contains two firepit features (Feas. 2, 6). These features, located at the north end of the house (which we hypothesize to have had a wattle and daub wall), appear as shallow pits lined with burned rock. The interiors of the pits contained lenses of charcoal and ash, small stones, and sherds. Both pits had been filled in to the top with additional small stones. The circumference of each pit and the floor area of the immediate periphery had been baked by heat. An area of burned earth was found between the firepits, adjacent to the foundations of Wall 7 (see below).

No seed or bone remains were recovered in the flotation samples taken from the firepits and surrounding areas, and their exact function (cooking or otherwise) remains uncertain. Charcoal from each feature was radiocarbon dated. The date from the Feature 2 sample (N-1951) is 610 ± 70 BC, and that from Feature 6 (N-1952) is 620 ± 85 BC. The features are separated by Wall 7 (implied by the foundation stones). This fact may be insignificant, since the firepits may not have been used at the same time, or again it may reflect a separation of activities.

Two firepits, used at the same time and separated by a partition, would have interesting implications for the composition and structure of the household, suggesting perhaps two families within the structure. However, we have not carried out an exhaustive search of the ethnographic record looking for modern parallels. It is also possible that neither firepit functioned for cooking, particularly in view of the presence of brazier fragments within this house. Whatever the function of the firepits, the fact that they are located in the eastern portion of Structure 1b, while obsidian debitage and cores were found in the structure's western area, does imply a separation of activities.

Structure 1c, the uppermost of the T-23 houses (Fig. 6.11), has interior dividing walls, but again no floors are clearly identifiable. The most interesting feature within the house is Feature 5, a stone circle filled with ash, small heat-cracked stones, and quantities of daub fragments with Compositae imprints. The feature is not a firepit because the earth within the stone ring is not burned or baked, and daub fragments would not normally occur within a firepit.

We believe that Feature 5 represents the remains of a collapsed *tlecuil*, a raised cooking hearth with a stone foundation and mud-plastered cane sides. Raised cooking hearths, constructed of stone or adobe, are still used in Chalcatzingo and throughout much of rural Mexico today. Whether the presence of firepits, cooking braziers, and a raised *tlecuil* within the three Structure 1 houses is significant in terms of an "evolution" of cooking methods is doubtful. Cooking braziers appear to have been the common means of food preparation throughout the site.

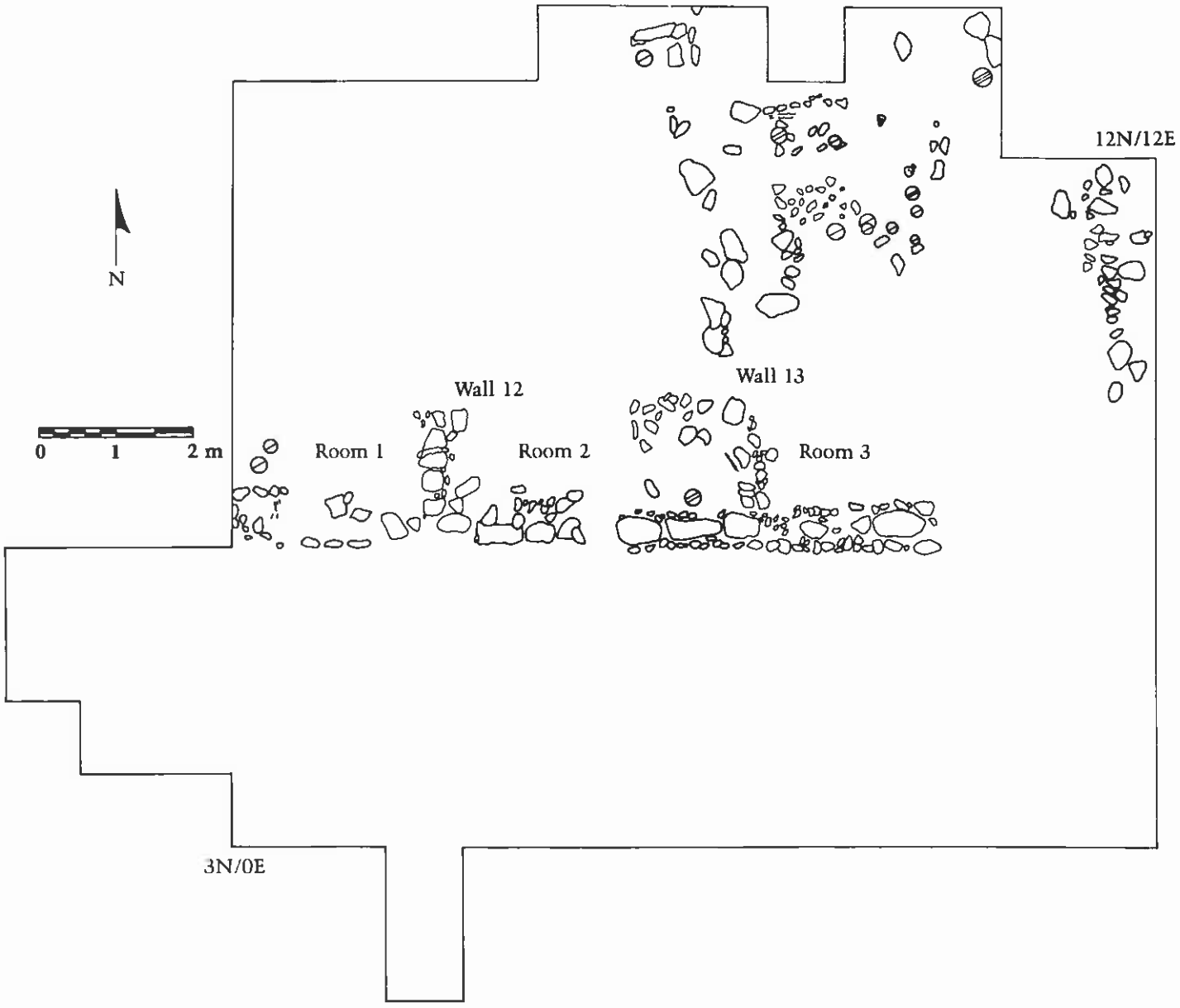

Figure 6.9. Plan map of T-23 Structure 1a.

Activity areas within Structure 1c are difficult to define, as the structure sits close to the plow zone and has been damaged both by plowing and by Classic period disturbances.

The Cantera phase structures on T-11 (Strs. 1 and 2; Fig. 4.21) demonstrate a different type of hearth area, in this instance separated from the main house structure. The main structure is Structure 1, while Structure 2 is a smaller building adjoining Structure 1 to the southeast. Structure 2 includes a feature composed of an area of burned rocks within which smaller rocks are patterned in a manner to suggest that they may have functioned as fire dogs. Charcoal specks, a burned stick, three vessels, and a broken metate were also found here. We know that cooking areas detached from the main house structure are common in central Mexico during the ethnographic present, but this is our only example at Chalcatzingo.

Nonsubterranean Storage Areas

In speaking of storage facilities, two different types of storage need to be considered. The first is the regular household storage of goods needed as part of the normal daily activities. Included within this category would be the storage of agricultural products such as corn. The second type of storage can be called "warehousing," meaning the storage of quantities of an item or items for exchange purposes. This latter type of storage must be considered when attempts are made to explain the large surface area covered by Cantera phase houses. Part of their interior space may have been utilized for warehousing if the site was heavily involved in redistribution and/or exchange networks.

The possibility that agricultural products were stored within house structures was tested by taking pollen samples from room "floors" in various structures

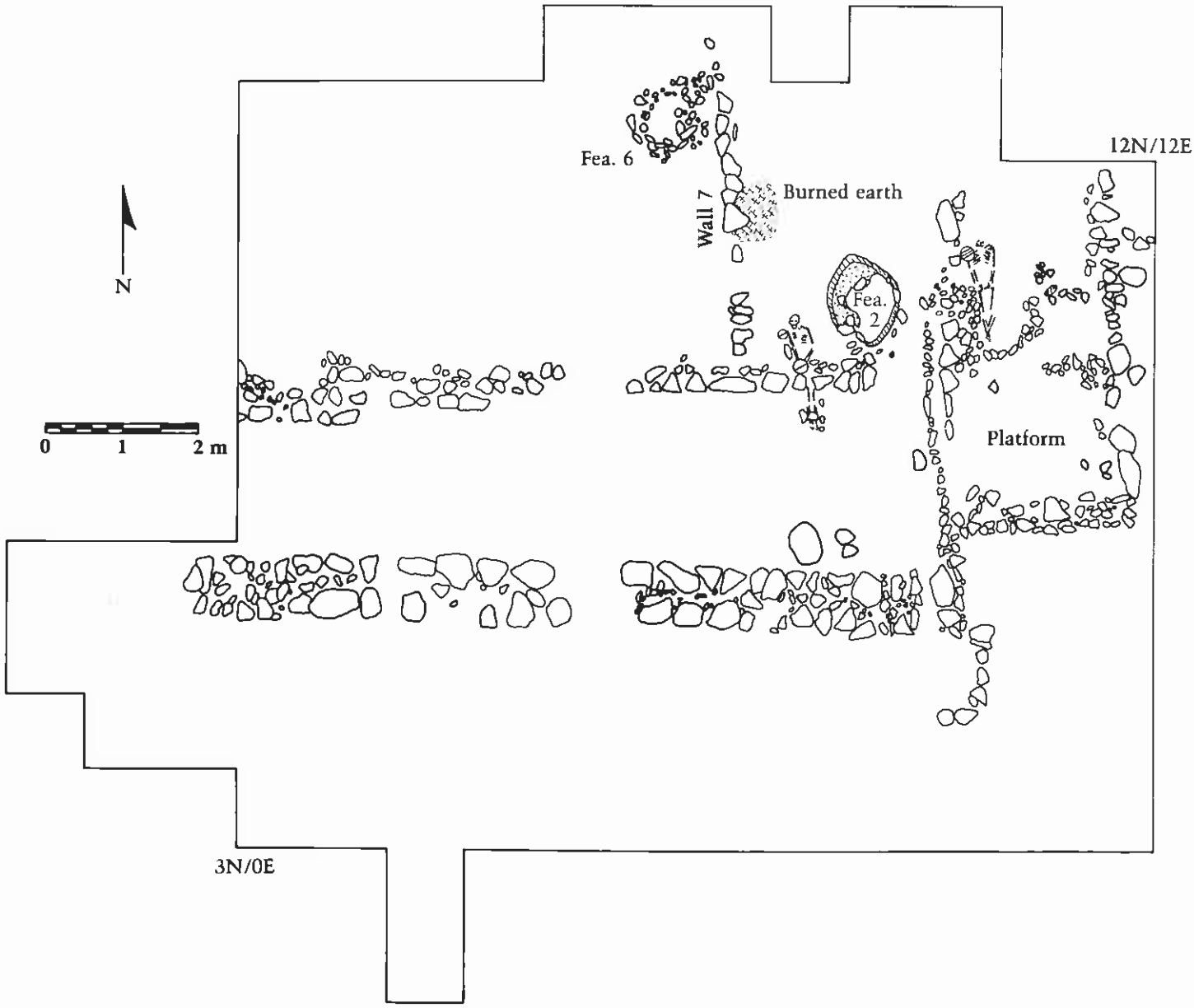

Figure 6.10. Plan map of T-23 Structure 1b.

(PC Str. 1, T-9B Str. 1, T-23 Str. 1a). The results show no appreciable difference in the pollen counts, suggesting that corn (in particular) was not stored within the rooms tested. Some rooms (e.g., T-9B Str. 1, Room 3) contain minor quantities of whole vessels, possibly implying the use of such rooms for storage.

Storage structures external to the residence are also probable. T-11 Structure 2, which may have served for cooking, also has an area which contained three vessels, two metates, and two manos. Due to the nearness to the presumed cooking area, this area was probably used to store food preparation artifacts. Other evidence of external structures is tenuous. Small wall segments north and west of PC Structure 1d may represent the flimsy foundations of short-term constructions used for storing corn or other items.

Trash Deposits

Trash disposal is obviously an important activity in any household, and features related to trash disposal are often part of what Winter (1976) has termed the "household cluster." Whether due to cultural reality or sampling biases, our only example of a subsurface pit excavated into bedrock comes from T-25 (Fig. 6.12), where it had been associated with a Barranca phase house. It may have originally functioned as a storage pit, but when excavated it contained trash and a human burial (no. 103). While such pits were commonly used for trash disposal at other Formative period sites, few were found at Chalcatzingo.

A subfloor trash pit (Fea. C-1) related to PC Structure 1c intruded downward (into subfloor fill) from about 60 cm below surface, a level which may have been an earlier floor. Included in the trash deposit were sherds, amorphous adobe lumps, two metates broken in half, and a stone sculpture (Fig. 20.12).

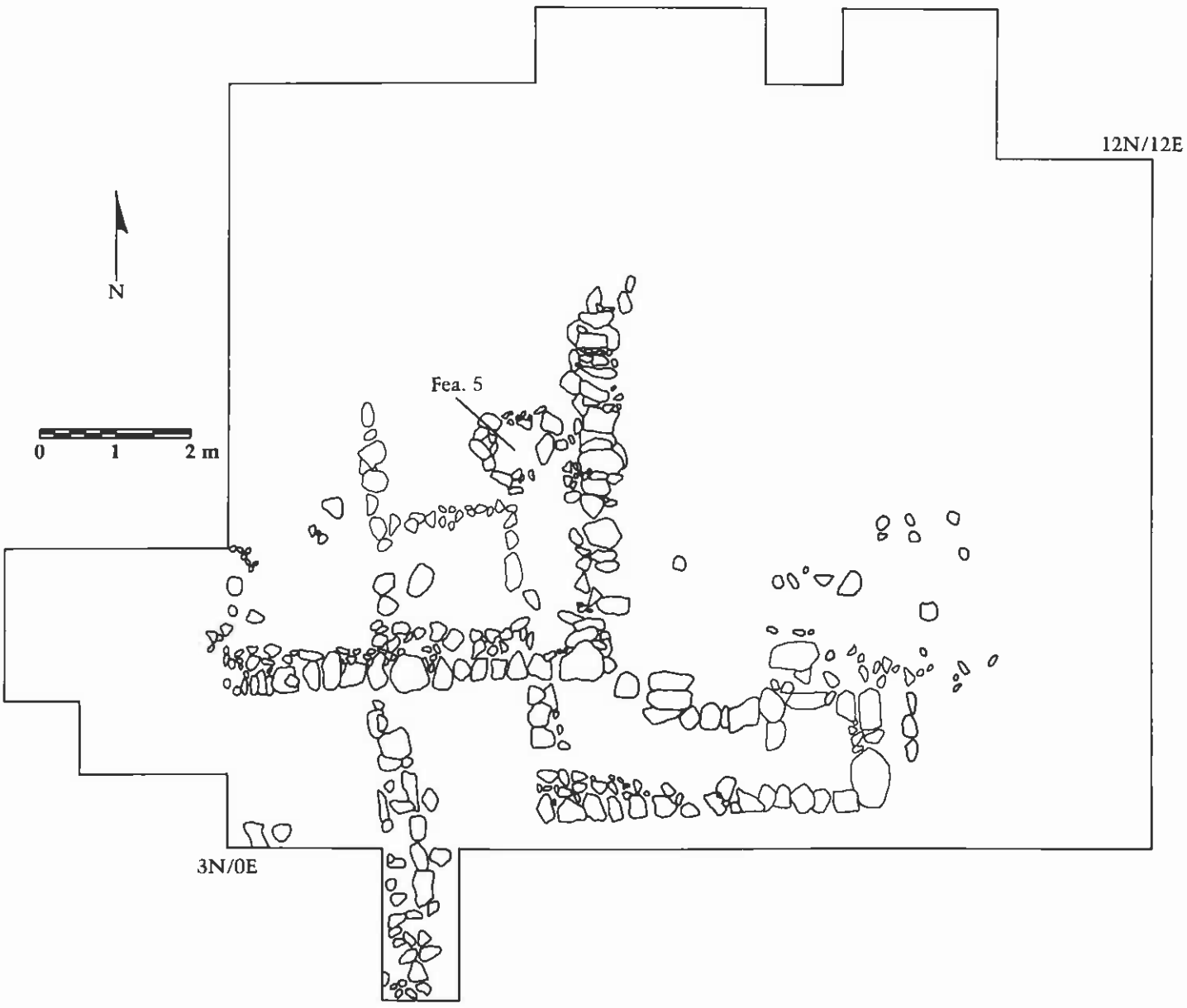

Figure 6.11. Plan map of T-23 Structure 1c.

The trash deposit associated with the T-23 Structure 1 complex is different from those above, since it apparently represents trash taken from Structure 1 and dumped in a low area (T-21) downhill from the house (Fig. 4.29). The deposit is stratified but exhibits no discernible temporal differences. It contained sherds, figurine fragments, worked stone, and animal bone, and it covered a disturbed burial (no. 78). A radiocarbon date on charcoal (N-1950; 830 ± 85 BC) is earlier than dates recovered from the firepit features of Structure 1b. However, the ceramics excavated from within the Structure 1 houses show no temporal differences from those of the trash pit, and they are clearly contemporaneous and related.

Burials

The majority of Chalcatzingo's Cantera phase burials occur beneath house subfloors and are presumed to be the remains of people who inhabited those houses at least sometime during their life. A sharp distinction in the quality of the grave and the mortuary furniture exists between the subfloor burials of PC Structure 1d and those of other houses. This is one major factor in the identification of Structure 1d as an elite residence during the Cantera phase (see Chapter 8).

Several anomalies exist in attempting to relate burial data to data gathered from the house excavations. Not all Cantera phase burials were within house subfloors (see Appendix C). Over twenty burials found on T-25 are unassociated with a house. Did these people come from various households? Also there is clearly a marked discrepancy between the quantity of burials found with PC Structure 1 (thirty-eight) and other houses (e.g., T-23 Structure 1 has seven burials).

If all members of a household were buried beneath the house floors, then

Table 6.1 **House Population Estimates Using Floor Area (Based on Naroll's 10 m²/person)**

Structure	*Floor Area (m²)*	*Estimated Population*	*Subfloor Burials*[a]
T-9B Str. 1	36	4	3
T-11 Str. 1	5	5	1
T-23 Str. 1c	63	6	7
PC Str. 1d	84	8	38[b]
PC Str. 2	63	6	10
T-4 Str. 2	49	5	5

[a]This table is worthwhile only if the tenuous assumptions are made that all individuals within a house unit were eventually buried within that unit and that all burials are essentially contemporaneous with that house floor.

[b]Shows either great time depth or that this was a special burial location.

Figure 6.12. Subterranean storage pit, T-25.

perhaps a greater number of burials should be expected, but in fact few were found. The correlation between household burials and Naroll's formula for estimating household populations is close (see Table 6.1), but using such a correlation would imply a house usage of the lifetime of one family.

It is unfortunate that most burials were in such poor condition that they could not be analyzed to determine age and sex. It might be that persons of certain age sets or sex received burial elsewhere. The same could apply to individuals of a certain descent group or lineage. Such differences are reflected in the Early Formative burial data from Oaxaca (Flannery and Marcus 1976b:381–382) but have yet to be as clearly defined in the Chalcatzingo data.

House Destruction and Rebuilding

Chalcatzingo's houses are like those of many other Formative period sites in Mesoamerica in one important aspect—they were destroyed by burning. The evidence for this is the quantity of burned daub recovered in excavations. Every Formative period house excavated at Chalcatzingo had fire-hardened daub fragments in association. In houses which show several rebuildings (e.g., PC Str. 1, T-23 Str. 1), the foundation walls of *each* building stage have burned daub associated with them.

These data indicate that the burning of house structures was a common occurrence. It is unreasonable to assume that houses burned down accidentally with regularity, or that the houses were periodically put to the torch due to hostilities. No burned artifacts are ever found within the houses, as should be in the case of houses which were set afire without the consent of the occupants. The burning of house structures thus appears to have been an intentional act by the inhabitants. As important as the destruction is the fact that a new structure was quickly rebuilt in the same location.

A basic sequence of destruction and rebuilding can be deduced from the data from the excavation of T-23 Structure 1, the complex set of house foundations which represent a Cantera phase structure burned, rebuilt, and enlarged at least twice. The sequence is based on changes in house foundations as evidence of rebuilding. However, it is highly possible that houses were burned and then rebuilt on exactly the same foundation walls, with no such changes as ex-

hibited in T-23 Structure 1. For example, while T-9B Structure 1 reveals no clear evidence of rebuilding, burned daub fragments occur in the subfloor fill, and there is no reason to believe that this daub is not from an earlier rebuilding of the structure. Therefore, while we can delimit two rebuildings of T-23 Structure 1 (three sets of foundations), this should be taken as a minimal number.

As mentioned, there is no evidence to indicate that the houses which were burned contained household (or other) objects at the time of the fire. The contents of the structure were removed prior to setting the structure afire. How much the house was dismantled at that same time cannot be determined. It is possible that the major roof support poles and beams were removed for reuse (their burned remains were never found in the excavations), and the roof allowed to collapse into the interior of the house before burning. Adobes from the walls may also have been removed and only broken fragments left in the fire area, since fired broken fragments are found, while baked complete bricks are rare. It is obvious that the wattle and daub walls were left to burn.

Following the fire, the entire area was cleaned thoroughly and the trash deposited somewhere away from the house site. The trash deposit on T-21 (a deposit related to the T-23 structure) included burned daub, although these fragments could represent minor debris which became included in the trash over a period of time. The subfloor trash pit (Fea. C-1) in PC Structure 1c likewise contained some burned daub. The floor area preserved by burning in PC Structure 2-1 ends relatively abruptly, suggesting that at this time sections of the floor may have been torn up. An alternative possibility is that the floors were removed prior to burning, possibly when the roof supports were taken down. Because foundation walls on various structures at the site in addition to T-23 Structure 1 are missing, it is probable that at this time too some stone foundations were dismantled and the stones reused in constructing the foundations for the new structure.

Following the clearing of the major debris from the house area, the area was leveled, leaving a cap of ca. 10–20 cm of fill overlying the foundations of the old structure. This fill material is white with ash and contains burned daub and adobe fragments, indicating that it derives at least partially from the area of the fire. Surprisingly, the fill lacks significant quantities of charcoal.

Although a cap of fill normally overlies the old foundation walls, some of these foundations were occasionally reused for the new structure. T-23 Structure 1 shows that with each rebuilding the structure enlarged to the south, suggesting that one possible factor in demolishing and rebuilding a house was the need for increased floor area.

In addition to the desire for a structure with greater space, other factors could lead to the decision to rebuild. One factor is obviously that neither adobe nor wattle and daub structures have great longevity. Evon Vogt (1969:90), using data from Zinacantan, estimates that a wattle and daub structure in that region will last twenty-five years, and an adobe house perhaps a decade longer. Adobe structures in eastern Morelos could have had a slightly greater life span because of the area's drier climate. Some adobe houses in the area have been standing for half a century, and while periodically reroofed and replastered, they are rebuilt only when the occupants desire a larger or more "modern" house.

As Vogt's data indicate, wattle and daub houses are less durable and cannot be rejuvenated with simply another coating of mud plaster (as adobe structures can). The estimate of twenty-five-year life span for wattle and daub structures in Zinacantan is related to structures in which the wattle is wooden sticks and poles. Chalcatzingo's constructions utilized Compositae stalks, which deteriorate quickly, and the structures would probably last no more than a decade at the most.

In addition to normal deterioration, wattle and daub constructions and the thatched roofs of adobe structures soon become the home of a variety of insects and vermin. Although this may not have been a primary factor in the decision to rebuild, it could have been contributory. There are obviously other factors which may have entered into the decision, some of which may not be revealed by the excavation data. A hypothetical example can be made through an analogy to Grove's explanation (Grove 1981b) of Olmec monument mutilation. Grove believes that at the death of a site's chief, monuments related to the chief were ritually destroyed. It is likewise possible that a house was destroyed at the death of the head of the household, although archaeologically this would be difficult to test on the basis of the present data.

Comments

Because Chalcatzingo's house structures can best be understood within the perspective of the overall settlement pattern at the site, a detailed discussion is provided later in this chapter, and only a few comments need be made here.

The house structures at Chalcatzingo during the Cantera phase are considerably larger than others reported in the literature for Mesoamerica. The average floor area is slightly over 60 m^2. A study by Barbara Ayres and John Whiting (1968:124) has demonstrated that 96 percent of the societies in which house floor area exceeds 200 ft^2 (18.5 m^2) are characterized by extended families, status distinctions, or both. The status distinctions (or social ranks) at Chalcatzingo are best defined by burial differences and are discussed in Chapter 8. That Chalcatzingo's unusually large houses were occupied by extended families may be a further logical assumption.

The possibility that Chalcatzingo's houses were large because they also served a warehousing or storage function must not be overlooked. The fact that the excavations of these structures did not uncover caches of nonperishable artifacts or raw materials does not negate the possibility that some areas of the structures functioned for storage. In fact, it is highly improbable that any stored items would have been left to be later found by archaeologists, because a structure was emptied prior to its destruction and also because floor areas are seldom preserved.

Within the houses, general activity areas have been identified. Each house, including PC Structure 1 (the elite residence), showed evidence of obsidian working areas, indicating that each household made many of its own tools. Blade production may have been more restricted, however. Robert Santley (1977a) has suggested that one or two part-time obsidian specialists could have produced a sufficient supply of obsidian tools for a population the size of Chalcatzingo's (see below), and thus it is possible that any additional obsidian knapping at Chalcatzingo was being done on a scale to permit export of the finished blades.

The large concentration of debitage found on T-37 (Chapter 19) is clearly the debris from an obsidian workshop which was probably located near the concentra-

tion. This great quantity of debitage may imply that if an export workshop was located at Chalcatzingo, it was related to only one or a few house structures, and that the obsidian knapping activities within the other houses were primarily for the use of those households.

The tentative identification of other activities with specific structures can also be made. PC Structure 2 appears to have been involved in the processing of iron ore into red pigment and in the manufacture of green stone objects (Chapter 23). S-39 may have been an area of ceramic manufacture (Chapter 16), and Mark Harlan (1979:488) has suggested that T-24 had a figurine workshop.

ARCHITECTURAL ORIENTATIONS AND ASSOCIATIONS

There is increasing interest today in the orientation of sites and the various buildings within a site. The best data obviously come from Classic and Postclassic period centers, for not only do they have greater quantities of architecture than Formative period sites but they have also undergone more intensive excavations and thus have more data available. Data on Formative period sites are still rare, and the nature of the site orientations therefore poorly understood. While there is a general assumption that the site alignments are probably astronomical, there have been suggestions that a lodestone compass may have been used on the Gulf Coast (Carlson 1975). This hypothesis remains to be stringently tested against regional magnetic declination differences and changes through time.

Chalcatzingo's alignments are presented in Table 6.2. Several explanations are possible for the various orientations, but we have yet to subject any to the rigorous testing they would need. Our one attempt (1972) to observe the sunrise of the summer solstice was frustrated by a cloud-laden sky and a drenching rainstorm.

The greatest problem in dealing with possible astronomical orientations at the site is that of the horizons. The eastern horizon for the main site zone is the Cerro Delgado, and the southern horizon is similarly dominated by the Cerro Chalcatzingo. Only the northern and western horizons are unobstructed, as of course is the view from atop the Cerro Chalcatzingo. The saddle between the two *cerros* could also have been important in astronomical observations.

Orientations do not have to be astronomical. The persons responsible for erecting the houses and/or public/elite structures could have oriented them to a landmark, although this is unlikely since orientations are not consistent. A major landmark, the volcano Popocatepetl, is N19E from the site but does not appear to have served as a point of orientation. It is also possible that some buildings were simply oriented to the natural topography of their field or terrace.

Amate Phase Orientations

Only two structures, PC Structure 4a–b and T-6 Structure 2, together with a wall section of unknown function (PC Structure 6a), are known to date to the Amate phase. PC Structure 4a–b, buried beneath the Cantera phase platform mound (PC Str. 4d), is exposed only in profile, and the short (1 m long) section of stone facing was insufficient for measuring the alignment. The PC Structure 6b wall has an orientation of N84½E (all orientations are being given to true north), while the south wall of T-6's Amate phase platform (Str. 2) is aligned N69½W.

Barranca Phase Orientations

The earliest Barranca phase constructions are a wall line exposed by the PC transect trench (PC Str. 7), which is too short to measure accurately (N40W ± 10°), and the site's major terraces. While these latter could simply be aligned with the topography of the original unmodified (Amate phase) hillslopes, the regularity of their front faces suggests otherwise. After nearly three thousand years of erosion and other modifications, their original orientation is obscured, but those west of the El Paso Drainage (T-15, T-17, and T-23) run essentially east-west (ca. N84W). The reasons for such regularity could have been ease of construction, erosion control, or an orientation toward a feature in the landscape or heavens.

As with Amate phase structures, the Barranca phase sample is too small to be meaningful. PC Structure 5, a stone construction facing north toward the PC platform mound (Str. 4), has an approximate orientation of N87½E. We have no data on the orientation of PC Structure 4 during the Barranca phase. The alignments of the T-9B house are difficult to measure because of the irregular nature of its walls of large stones, but are approximately N4½E. The late Barranca subphase platform-like structure, T-29 Structure 1, has two clusters of readings taken from its substructure walls: N15½W and N75½E.

Cantera Phase Orientations

The orientation of structures during the Cantera phase is remarkably consistent, which suggests that these alignments were purposeful. A significant point is that the consistency is not simply among the public/elite structures but is found in the domestic architecture as well. In other words, it was a community-wide pattern shared by the architects of the stone-faced platforms and the builders of the houses (in this latter case, presumably their residents).

It is during the Cantera phase that we also begin to see significant associations between various structures. An example of this is found with PC Structures 1d and 2, which faced onto a common "court" area on the southwest side of the Plaza Central. Structure 1d's main axis runs N–S and is oriented N½E. Structure 2's axis runs E–W and is aligned within 1° of Structure 1d (all readings were taken with hand-held Brunton compasses and are probably accurate only to ± 1°). The northern (front) wall of Structure 2, if extended ca. 20 m eastward, would touch (and align with) the southern wall of Structure 1d. This indicates that their positioning was purposeful and careful.

Archaeomagnetic samples taken from the burned floor of PC Structure 2 demonstrate that at the time the house was burned, magnetic north was 5.6 ± 4° east of true north. This seems to indicate no relationship between structure orientation and magnetic north (cf. Carlson 1975). Radiocarbon dates from the structure (N-1707, N-1708; see Table 5.1), while not definitely related to that particular burning, place the general age of PC Structure 2 at 620–630 ± 85 BC.

While we can only estimate the general alignment of the Cantera phase PC Structure 4 platform based on its present topography, it appears very close (ca. N88½W) to the PC Structures 1 and 2 alignments, suggesting that this was the basic orientation of the Late Cantera subphase Plaza Central public/elite area. A stone line adjacent to Burial 40 atop the Structure 4 platform was oriented N84½E, and the tomb structure at the east end of the mound was N5E, but the significance of these deviating alignments is unknown.

Table 6.2. **Architectural Orientations (True North)**

Phase	*Structure*		*Orientation*
Amate	PC Str. 6b		N84½E
	T-6 Str. 3		N69½W
Barranca	PC Str. 5		N87½E
	T-9B Str. 1		N4½E
	T-29 Str. 1		N15½W
			N75½E
Cantera			
Public/Special Architecture	PC Str. 4d		N88½W
	T-6 Str. 1		N3½E
	T-15 Str. 5		N84½W
	T-25 Mon. 22		N87½W
	T-25 Str. 2		N87½W
	T-27 Str. 1		N87½W
Houses	PC Str. 2		N88½W
	PC Str. 3		N5E
	PC Str. 1		N½E
	PC Str. 6		N85½E
	T-4 walls		N73W
			N6½E
			N1½E
	T-9A Str. 1		N1½E
			N2W
	T-11 Str. 1		N3W
			N88W
	T-11 Str. 2		N89½W
	T-21 wall		N4½E
	T-23 Str. 1a	Wall 2	N84½W
		Wall 3	N2E
		Wall 4	N7E
		Wall 5	N79½W
		Wall 11	N85W
		Wall 13	N83W
	T-23 Str. 1b	Wall 6	N83W
		Wall 7	N2½E
		Wall 8	N81W
		Wall 10	N3E
	T-23 Str. 1c	Wall 9	N83½W
		Wall 12	N5E
		Wall 14	N7E
	T-24 Str. 1		N88W
			N3W
	S-39 Str. 1		N88½W
			N1½E
Classic	T-3 Str. 1 stairway		N½W
	T-4 Str. 3		N12½E
			N76W
			N11½E
	T-15 Str. 2		N87½W
	T-15 Str. 4		N16½E
			N13½E
			N75½W
	T-17 platform wall		N6½E
	T-20 Str. 2		N77½–80W
	T-27 Str. 2		N4½E
			N2E
Postclassic	Tetla-11 house		N9½E
			N80W
	Tetla ball court		N64½W
	Adoratorio stairs (Aveni 1980:App. A)		N17°17′E
			N21°22′E

Stone-faced platform structures sit on the terraces to the north of (below) the Plaza Central terrace. The T-6 platform (Str. 1) is oriented N3½E, the T-15 platform (Str. 5) N84½W, while T-25 Structure 2 and T-27 Structure 1 are both N87½W, as is the table-top altar (Mon. 22) on T-25.

As mentioned, three of the stone-faced platforms, T-6 Structure 1, T-15 Structure 5, and T-25 Structure 2, have stelae in association. The stela (Mon. 27) with the T-6 platform, while facing outward with the same orientation as the structure, is off-center in its placement, standing 4.9 m from the north end of the 15.7 m long platform. Monuments 25 and 26 are apparently contemporaneous with the platform and with Monument 27. The location of these monuments is arrived at by projecting the alignment of the T-6 platform (N3½E) another 15.7 m to the north.

Monument 21, the stela erected in front of the T-15 platform (Str. 5), is also placed off center, in this instance 3.9 m from the structure's west end. Based on the position of the fallen stela when discovered, it is highly probable that this monument's carved face pointed eastward, rather than to the north, the direction the platform faced. The stela associated with the nearby T-25 platform (Str. 2) sits at that platform's southwest corner and is oriented to face the east or west (the carved area is missing). Thus, no matter which way the platform structures themselves faced, all the stelae (including Mon. 26 associated with the round altar) faced only east or west.

The reader will have noticed that the distance 15.7 m repeats itself on T-6 measurements. The platform is 15.7 m long, and Monuments 25 and 26 are situated 15.7 m from that structure (and essentially in alignment with it). When we noticed that repetition, we decided, primarily out of curiosity, to calculate the difference in length between the T-15 platform (19.5 m) and the T-6 platform (15.7 m). The difference is 3.8 m. This is also approximately the distance which the stela (Mon. 21) is offset from the corner of the T-15 platform. This distance, 3.9 m, is apparently one Cantera phase unit of measurement. Three times 3.9 is 11.7 m, the length of the T-27 platform (Str. 1c). Four times that unit is about 15.7 m (T-6 Str. 1), and five times the unit is 19.5 m (T-15 Str. 5). The T-25 altar (Mon. 22) and patio may also use this module.

Curiously, the placement of Monument 27, the T-6 in situ stela, does not seem to fit the hypothesized 3.9 m module, nor does every Cantera phase structure at Chalcatzingo. In many cases the wall sections uncovered in our excavations were too destroyed to be accurately measured. The analysis of these data are still underway. However, using the module it is at least possible to hypothesize that the length of the site's largest mound, PC Structure 4d, might have been 20 module units (78 m), which is close to the mound's estimated present length.

There are few data available which allow us to compare the Chalcatzingo alignments with those of other Middle Formative sites in the central highlands or with other centers in Mesoamerica. Two alignments are known for La Venta: the main complexes are oriented N8W, while the Stirling Group is N7E (e.g., Heizer, Graham, and Napton 1968: Site Plan). Laguna de los Cerros' main mounds (Bove 1978: Map A) seem to duplicate the La Venta main complex's alignment. The orientation of the Central Court and Palangana groups at San Lorenzo align to true north (Coe and Diehl 1980:29, Map 2), essentially midway between the two La Venta orientations.

The trend of alignments at Chalcatzingo is clearly slightly east of north, ranging between that of Middle Formative San Lorenzo and La Venta's Stirling Group. However, because of the variation (however slight) in the orientation of Cantera phase public structures and residences, it is of doubtful value to compare them with those of Gulf Coast centers at this time.

THE SETTLEMENT PATTERN

In attempting to reconstruct an overall view of the site, particularly as it appeared at ca. 500 BC, one feature is quite clear: The Cantera phase village was a dispersed settlement spread over the terraced hillside. While most of the terraces were "residential" in the sense that each served as the location of a house structure, a limited number of terraces near the upper center of the site can be distinguished as public (and elite) areas (Plaza Central, T-6, T-15, T-25). The development of this pattern is considered in the discussion which follows.

Amate Phase, 1500–1100 BC

The Amate phase occupation was built upon the unmodified hillside slopes. Because the Amate phase levels were disturbed, destroyed, or deeply buried by the Early Barranca subphase terracing, only a general estimate of the site size can be made. The estimate is based on the distribution of undisturbed (buried) Amate phase levels found during the excavations and on one area of Amate phase sherds found during the site survey.

The Amate phase settlement occupied the hillside area today covered by the Plaza Central terrace, T-15, and T-6. It is probable that the T-2 area was also part of the occupation zone, for although T-2 has not been farmed in years, Amate phase sherds have been found along its northern terrace face. Sherds from this phase have also been found on the northeast edge of T-11 and represent the westernmost known extension of the occupation zone. Amate phase deposits were also found during the excavations on N-2 and N-7, fields below the hillside and north of the small stream. There are no data to indicate any Amate phase occupation between the T-15 area and the N-2 and N-7 fields, but the latter areas have been included for our population estimates.

Using the present surface areas of the terraces and fields which have yielded Amate phase materials as a way of calculating the general coverage of the occupation zone, the Amate phase occupation of the upper hillside covered an area of roughly 4–6 ha, and that at the base of the hill 0.6 ha. Using the criteria for estimating site size and population of settlements located during the project's regional survey (Chapter 21), the Amate phase occupation can be classified as a Hamlet, with an estimated population of up to 66 inhabitants.

Although possibly only a Hamlet in size, Amate phase Chalcatzingo included two monumental architectural features, the PC Structure 4a mound and the T-6 Structure 3 platform. The only other architectural feature known from this phase is a wall, PC Structure 6a, to the east of the PC Structure 4a mound. It is significant that these architectural features occur in areas which were important public/elite areas during the Cantera phase. It seems highly probable, particularly in the case of the Plaza Central area, that the choice of this location for a public building (PC Str. 4a) set the pattern for public areas which was con-

tinued by later generations (during the Barranca and Cantera phases) at Chalcatzingo.

No carved monuments or stone sculptures can be attributed to the Amate phase occupation.

Barranca Phase, 1100–700 BC

The Barranca phase essentially begins with a major change in the site's configuration. During the Early Barranca subphase the natural hillside slopes were intensively modified to form a series of terraces which created ca. 10 ha of level fields. This massive cut-and-fill operation disturbed the majority of the Amate phase deposits, in most cases removing them to be deposited as terrace fill. The terrace construction included well-planned water-control embankments on the two major rainfall drainages crossing the site (T-15 Str. 1, El Rey Drainage Str. 1) for the purpose of neutralizing the erosional effects of heavy rain runoff.

It is obvious that, with a completely different topography following the terracing, the settlement pattern should be modified. However, since the arrangement of the Amate phase dwellings is unknown, the extent of the changes cannot be determined. The spatial extent of the site is greater at this time, incorporating T-9, T-21, T-25, T-29, and east of the El Paso Drainage, T-20, in addition to the continued occupation of the original Amate phase "core area." At the base of the hill only N-2 has evidence of use. The total area covered is estimated at 13 ha, including ca. 1 ha of public area (ca. 8 percent of the total area). Thus, the settlement is classified as a Small Village with a probable population of 130–325.

The expansion of the Barranca phase settlement indicates an expanding population and the need for more land. The increased desire for agricultural land may be reflected in the decreasing use of the land near the spring for settlement, suggesting a switch from domestic to agricultural land use.

At this time only the Plaza Central (T-1) area can be defined as a public/elite area. PC Structure 4 was enlarged (Stage c) and PC Structure 5 built immediately to the south, indicating that the area remained important during this phase.

Only one complete Barranca phase house structure, T-9B Structure 1, was found. A floor fragment and a trash pit on T-25 indicate that a Middle Barranca subphase dwelling had been situated there as well. T-29 Structure 1, a structure of uncertain use (public or residential), is also Barranca phase. While these data are minimal, they do seem to show similarities to the more abundant Cantera phase house data. The Barranca phase houses are widely separated, and there are no indications of more than one per terrace. This suggests that the Barranca phase settlement, like the Cantera phase settlement, was dispersed (see below). It is for this reason that using site area as a means of calculating population must be approached with caution.

Although no stone carvings or monuments can definitely be assigned to the Barranca phase, it is possible that Monument 22, the T-25 altar, may have originally been carved early in this phase. The Chalcatzingo altar is an enigma, for while it occurs in a very good Cantera phase context, its monolithic Gulf Coast counterparts are all apparently Early Formative monuments. Since it is imitative of those Gulf Coast monuments, it must be considered to be closely contemporaneous with them. As noted in Chapter 7, we know little of the history of the altar prior to its rebuilding on T-25.

Cantera Phase, 700–500 BC

During the Cantera phase the settlement extended beyond the terraced hillside and covered an area of about 40 ha. It is probable that several smaller, peripheral terraces (T-4, T-24, CT-1) were constructed on the talus slopes at this time. The presence of stone-faced platform structures on T-6, T-15, T-25, and T-27 demonstrates that the public/elite areas of Chalcatzingo likewise increased in extent. These special site areas cover a total surface of nearly 5 ha, about 12.5 percent of the land surface of the main site zone.

The most important of the special site areas was apparently still the Plaza Central. The northern end of this large terrace is flanked by the PC Structure 4 platform mound, while at least three house-like structures were located along the southern edge. One of these, PC Structure 1, has been classified as an "elite" residence based on its elaborate subfloor burials (Chapter 8). Its location across the plaza from PC Structure 4 suggests not only that it had special status in comparison to other residences on the site, but also that it may have been occupied by the community's "chief."

The two structures to the west of PC Structure 1 (the PC Str. 2 group) can be said to have had special importance simply on the basis of their location. Their positioning in relation to PC Structure 1 suggests that they faced and shared a common "patio" area. While the PC Structure 2 buildings may have served as residences, the quantity of iron ore fragments and green stone in the structures and in the patio area indicates that workshop activities were also important.

The presence of platform structures with associated stelae on terraces lacking surface indications of Cantera phase houses suggests that these platforms could also have been substructures for elite residences, although only the T-25 and T-27 data seem to confirm this possibility. Whatever their function, their location indicates that the upper terraces on both sides of the El Paso Drainage constituted a special area of Cantera phase Chalcatzingo.

Apart from the special site areas, each of the remaining terraces and fields of the main site zone had one large Cantera phase house structure located upon it. Although other areas of these terraces were only incompletely tested, it appears likely that no other residences or major structures (contemporaneous with the house structure) occupied a terrace. The resulting pattern across the site is therefore that of a dispersed settlement.

In comparing Chalcatzingo to other sites in the valley, those of comparable size (Chapter 21; Appendix H) seem likewise to have been dispersed. The surveys of the southern Valley of Mexico have shown Middle Formative nucleated villages and dispersed settlements (Sanders, Parsons, and Santley 1979:96–97, Map 9). Therefore, a dispersed settlement type is not necessarily "unusual" for Middle Formative central Mexico (see also comments in Chapter 27). At Chalcatzingo the dispersed Cantera phase settlement may simply be a continuation of the older Barranca phase pattern, although the fuller implications of the pattern may not be completely understood on the basis of the present data alone.

Each residence in the Cantera phase community sat alone on an individual terrace or field. Although one or two impermanent structures may also have been present, the remaining area of each field was apparently utilized for agricultural purposes. If this hypothetical reconstruction is correct, then in addition to whatever major functions the site may have had as a center for local or regional redistribution, exchange, or ceremonial

functions, it was still an agricultural village.

It is significant that when a house was destroyed and then rebuilt, the rebuilding usually took place in the same location. The continued presence of a house on a particular piece of land implies some type of proprietary use rights to that field or terrace. Because the houses were continually rebuilt in the same location over what must have been a number of generations, it is highly likely that this use right was hereditary. The facts that the house location did not shift and that other houses were not built on the same piece of land suggest that agricultural land was at a premium, and that terraces then, as today, were considered prime land. The Cantera phase settlements in Tetla and in the flatlands between the site and the present village (Appendix H, RAS-1, -326, -328) probably reflect the expansion of the site's growing population into more marginal lands.

As Chalcatzingo grew over time, it spread outward from the original Amate phase "core area." It can be presumed (and this is generally confirmed by the archaeological data) that the terraces nearest to this "core area" have been the longest inhabited. This suggests that if each field or terrace was indeed passed on in a hereditary manner, and this system maintained over many centuries, then perhaps land closest to the "core area" belonged to the oldest lineages. While there is no evidence that the regular house structures nearest to the "core area" have any greater status or importance than those farther away, the "conversion" of T-15, T-25, and T-27 from residential terraces to areas with special stone-faced platforms (whatever their function) could be important in this regard. While this "conversion" probably reflects the expansion of the public/elite area and nothing more, it could imply that the residents of these upper terraces became part of the site's elite group, possibly because they were from the oldest lineage(s). This could be taken to indicate that the elite were local personages and not "outsiders." More excavations on these upper terraces are needed to further explore these possibilities.

It should be mentioned that based on house burials and their associated grave goods (Chapter 8), only PC Structure 1 is clearly of a higher status. The remaining houses (this does not include platform structures) appear relatively homogenous. If any further differences in social rank are found at Chalcatzingo during future field work, it may be between occupants of the main site zone and the peripheral zones (Tetla and the flatlands).

It is difficult to estimate the Cantera phase population for Chalcatzingo, and several conflicting estimates exist. If Naroll's formula is used to calculate household population, a figure of ca. 7 inhabitants per house is reached. While the exact number of occupied terraces and fields in the main site zone with Cantera phase houses is difficult to determine, an estimate of 20 is relatively close. Combining these figures provides a population estimate of 140 people. This number is perhaps low, but the estimate refers only to the main site area and does not consider Tetla and the flatlands (the latter area is included in Hirth's estimate in Chapter 21).

Using paleoecological data to determine the carrying capacity of the terraces and land adjacent to the stream, David Bugé (1974:4) suggests that a population of ca. 600 could have been supported. However, since the public/elite terraces may not have been used for agricultural purposes, and because houses also occupied an area of each agricultural terrace, a reduction of one-third might be appropriate (ca. 400 people).

Kenneth Hirth (Chapter 21) has estimated a minimum of 433 and a maximum of 1,081 for the Cantera phase population at Chalcatzingo. The maximum seems too high.

Based on the settlement data as we now interpret them, the household size and paleoecological data provide perhaps the best population range for the main site area, 140–400 people. While this number may seem low, it is far too easy to overestimate the populations of early villages. Chalcatzingo had a dispersed settlement, and our population estimate suggests that it was still a Small Village. At the same time, however, the settlement functioned as perhaps the major political-religious center in central Mexico (see Chapter 26), with strong external ties, public architecture, and impressive monuments. As Joyce Marcus (1983) has pointed out, preindustrial cities were ranked at the top of their regional hierarchies not necessarily because of their size, but through their ritual status or political power.

RESUMEN DEL CAPÍTULO 6

La arquitectura del período Formativo en Chalcatzingo puede clasificarse como pública-especial y residencial. Las construcciones de la categoría pública-especial son PC Str. 4, el montículo plataforma larga, y PC Str. 5, las cuales constituyen ambas alguna forma de arquitectura pública, así como cinco plataformas con cara de piedra, algunas de ellas asociadas con estelas: T-6 Str. 3 (Fase Amate), T-6 Str. 1, T-15 Str. 5, T-25 Str. 2, y T-27 Str. 1. La arquitectura del montículo es muy rara en el centro de México durante el Formativo Temprano y Medio, aún cuando es común en el sur; por lo tanto la presencia de estas estructuras en las secuencias iniciales en Chalcatzingo le da significado a la importancia que tiene el sitio en la región.

La otra categoría, las estructuras de casas, consiste de dieciseis estructuras incompletas, trece de las cuales pertenecen al Formativo Medio. El enfasis en la excavación se dio en estas estructuras y en sus interiores. No se localizaron por medio de muestreo al azar, sino por la observación hecha en cada caso de que la terraza tuviera una concentración de tepalcates que correspondiera con los restos de una casa. La mayoría de las casas estaban dañadas seriamente por la erosión y el arado.

Los datos provenientes de las casas producen un cuadro compuesto de residencias del Formativo Medio. El rasgo que separa a las casas de Chalcatzingo de otros asentamientos del Formativo es su gran tamaño, con un área de piso estimado para la fase Cantera 63 m², la cual es más de dos veces el área de otras casas conocidas del período Formativo. Los cálculos de población basados en la superficie de piso pueden no ser aplicables a Chalcatzingo porque no se sabe si toda la estructura servía como residencia.

Las casas de la subfase Cantera Tardío consisten típicamente de tres paredes de adobe y una pared de varas y revestimiento. Esta última problamente tenia la función de dejar entrar el aire y salir el humo. Las paredes de varas se asociaban comunmente con una sola hilera de piedras como cimiento. Las paredes de adobe tenían un cimiento más grande y más pasado, generalmente de varias hiladas de piedra de ancho. Las paredes de varas (Compositae) se construyeron de los diferentes recursos que abundan en la localidad, cubiertas con

una plasta de lodo. Algunas de las estructuras de las casas presentan muestras de haber sido pintadas con un pigmento de kaolín blanco. Los pisos casi nunca aparecen completos ya que se hacían de tierra aplanada o plasta de lodo. Los restos escasos de los materiales utilizados para el techado, hacen que tanto el pasto como los Compositae sean los candidatos viables a usarse para el objeto.

Las paredes interiores indican que las casas estaban divididas en varios cuartos, y el material del que estaban hechas sugiere que se llevaron a cabo diferentes actividades en los varios cuartos, por ejemplo dormir, guardar, cocinar, manufacturar herramientas de piedra. La preparación de alimentos parece haberse realizado principalmente sobre braceros de cerámica. A los muertos comunmente se les enterraba bajo el piso de la casa. Nuestra muestra de casa, tal vez falseada, revela poca muestra de basura o de rasgos de almacenamiento.

Los habitantes quemaban periódicamente las construcciones y reconstruían en el mismo lugar, probablemente debido a que no eran muy durables y sí facilmente invadidas por insectos y las sabandijas. También es posible que se hayan destruido a la muerte del jefe de familia.

Durante la fase Cantera, para la cual tenemos la mayoría de los datos, tanto las estructuras pública-especial como doméstica presentan un patrón consistente de alineamiento en comunidad dispersa. La preferencia de asentamiento claramente muestra la dirección un poco hacia el oriente del norte, con lo cual la orientación queda dentro de las del grupo Stirling de La Venta y las de San Lorenzo. También hay muestra de un módulo de medida de 3.9 m en la fase Cantera. Los múltiplos de este módulo aparecen como las longitudes de varias estructuras y fueron utilizadas también para ubicar las estelas.

El desarrollo del patrón de asentamiento del sitio puede ser rastreado hasta la fase Amate. El asentamiento de la fase Amate ocupó las pendientes de la montaña que no han sufrido modificación, comprendidas hoy en T-1, T-15, y T-6 y una segunda superficie que consiste de N-2 y N-7. Estos dos poblamientos por separado cubrieron cerca de 6.5 has. con un cálculo aproximado de 66 habitantes por poblamiento. Hay dos estructuras monumentales que admiten fechamiento en esta fase inicial, el montículo de plataforma PC Str. 4a y la plataforma de piedra con cara esculpida T-6 Str. 3.

Durante la subfase Barranca Temprana las pendientes de las laderas naturales se modificaron intensivamente para crear las series de terrazas con las que formaron cerca de 10 has. de terrenos en distintos niveles. También se construyeron dos grandes canales de drenaje para el agua de lluvia y el control del desbordamiento del agua. Estos cambios son indicativos de un aumento en la población y en la necesidad de tierra para agricultura y habitación. Aparentemente, durante este tiempo se inició el patrón de tener una sola casa por terraza, indicativo de que el asentamiento de la fase Barranca fué disperso, semejante al asentamiento de la fase Cantera. La Plaza Central continuó como área pública elítista del sitio. Solamente se puede fechar un monumento en esta fase, el altar T-25 que ha sido fechado tentativamente en la subfase Barranca Temprana dado que sus adornos de la costa del Golfo son todos del Formativo Temprano.

Durante la fase Cantera el asentamiento se extendió más allá de las laderas terraceadas y llegó a cubrir una superficie de cerca de 40 has. Las áreas elite-públicas se aumentaron para incluir T-6, T-15, T-25, y T-27, las cuales junto con la Plaza Central cubren casi 5 has. o 12.5 por ciento de la superficie del sitio principal de la zona. Probablemente la residencia del (de los) líder(es) de la comunidad es PC Str. 1. Cada terraza continúa teniendo solamente una casa, lo cual implica que las terrazas cumplían una función agrícola a la vez que residencial. Es posible que el uso de la tierra terraceada preferente fuera un derecho hereditario, y con ello tal vez se obtenga la base para establecer rangos diferentes en las familias o linajes de la comunidad. La posibilidad de que la élite del sitio consistiera de miembros de los linajes más antiguos, los cuales vivían en las terrazas más altas, sugiere que estos fueran personajes locales, y no "furáneos."

Los datos del tamaño de las casas y los de la paleoecología referentes a la capacidad de carga del área del sitio nos dan un rango de población para el área del sitio principal de 140–400 personas durante la fase Cantera. Este número puede parecer bajo, y en parte se debe al reflejo de la naturaleza dispersa del patrón de asentamiento, pero no se desvía de las otras muestras que indican que Chalcatzingo era un centro político-religioso importante con lazos externos fuertes. Las ciudades pre-industriales se catalogan en la cumbre de sus jerarquías regionales, no necesariamente debido a su tamaño, sino por la indicación de su actividad ritual o su poder político.