
26. Contemporary Agriculture at Chalcatzingo

DAVID E. BUGÉ

The close physical proximity of the present village of Chalcatzingo to the archaeological zone reflects a continuity of prehistoric and contemporary agriculture. Despite the influx of new technology, subsistence farming has changed little since the Formative period. Oxen, plows, and fertilizer have added to the farmer's repertory and production has increased, but the constraints of land, labor, and crops still limit the farmer's ability to change. Even more important, today's farmers are part of an international economy which ultimately determines the success or failure of their adaptive strategies.

The present agricultural system at Chalcatzingo is the outcome of a long history of individual decisions made as farmers attempted to provide food for their families and supply their other needs. In any one year there are new and different problems, which may be met by innovative solutions but which are usually solved through traditional means. This chapter examines the character of the agricultural system in terms of the constraints on farmers' decisions. These constraints are, in turn, selective of certain adaptive strategies or "the patterns formed by the many separate adjustments that people devise in order to obtain and use resources and to solve the immediate problems confronting them" (Bennett 1969:14).

Aspects of both environment and culture are considered as factors of a single system, subsistence agriculture. These elements form the "socio-environmental stresses" or constraints in Kent Flannery's (1972:409) terms. These constraints determine the decisions which a farmer must make throughout the course of the agricultural cycle. Decisions, however, are not all of the same importance. Two levels, the tactical and the strategic, can be defined. The first involves adjustments to variations in climate, labor

supply, and household needs, while the second involves goal-setting and choices between different adaptive strategies. The pattern of daily activity results from tactical decisions, but the overall character of the agriculture system is the result of strategic choices.

Because choices on different levels have different constraints, these levels must be distinguished during analysis. Therefore, the chapter proceeds from a discussion of those factors which constrain tactical decisions to an analysis of different adaptive strategies and their selective constraints.

LAND

In 1926 a grant of 901 ha of land (Fig. 26.1) was made to the village of Chalcatzingo by the Mexican government as a result of the land reforms begun by the Revolution of 1910–1916. Control of the land is vested in the *comisario ejidal* and his assistant, elected officials of the *ejido* of Chalcatzingo. Of the land in the grant, 8.7 ha are irrigated today and the remainder is *temporal* or unirrigated land. The average holding by members of the *ejido* is 2.89 ha with a range from 0.5 to 7.5 ha.

Three classes of land were included in the grant. The *fundo del pueblo* is private land and consists of houseplots in the village, a small number of unirrigated fields, and a section of privately owned irrigated land along the stream between the village and the site. This land can be bought, sold, rented, or sharecropped without restriction. Some plots of private land have recently been sold to people living outside the village, but there is strong pressure to keep the land under village control.

The irrigated land west of the village is *ejido* land, which cannot, in theory, be bought or sold, but which is frequently sold or rented. It may be rented by non-

ejido members, but there are social sanctions against selling land to outsiders. The irrigation system is fed by canals from a reservoir at Monte Falco (ex-hacienda Santa Clara). The reservoir is, in turn, fed by canals originating on the Río Amatzinac above Zacualpan. The system has only minimal value, however, because water is so heavily utilized by villages closer to the source that no water reaches the reservoir during the dry season. Chalcatzingo has protested to the state government, but lacks sufficient political power to get changes made. As a consequence of the limited irrigation water supply, farmers tend to grow valuable cash crops on irrigated land, using irrigation to supplement rainfall to insure a good crop.

The majority of the *ejido* land is *temporal*, usable only during the rainy season. There are two named areas, La Joya just south of the village and La Esperanza to the east across the Río Amatzinac. Among the thirty-four people who presently have fields in La Joya, the average holding is 2.0 ha, with a range of from 0.3 to 2.5 ha. The land in La Joya is of variable quality but is generally better than that in La Esperanza. That coupled with the fact that La Joya is closer to the village makes it more desirable. La Joya was completely irrigated during the hacienda period, but the reservoir and canals have fallen into disrepair and no longer function. A small section, less than 10 ha, of La Esperanza is irrigated by a new reservoir, but this system functions only during the rainy season.

The remainder of the village land is *cerril*. This section includes the highly prized terraces of the archaeological zone, the steep and rocky masses of the Cerro Delgado and Cerro Chalcatzingo, and the fields of the Tetla zone. With the exception of site terraces and the Tetla fields, this *ejido* land is used primarily for grazing and for collecting.

SOILS

The farmers of Chalcatzingo use a hierarchical classification system for ranking the potential production of agricultural land. The two major categories of land, *tierra amarilla* and *tierra negra*, are distinguished on the basis of their soil color, which reflects both the mineral composition of the soil and its organic content. Within the *tierra negra* class of soil there are two further types which are recognized by farmers: *arena* (sand) and *barro* (clay).

Tierra amarilla or yellow soil consists of coarse light brown to yellow soils which have low organic content and poor moisture-retention capacity. It is the least productive soil under normal conditions but can exceed that of the other types in years of extremely high moisture. The majority of La Esperanza and parts of the hillslopes of La Joya consist of *tierra amarilla* soils. Corn and peanuts are the preferred crops on this soil, as they have low moisture requirements and grow well in friable soils.

Tierra negra or dark soil is a highly organic, fine-grained soil with good moisture-holding capability. *Tierra negra* is about twice as productive as lighter soils due to its greater fertility and ability to maintain moisture during short dry periods. The disadvantage of *tierra negra* is that it may become waterlogged during periods of prolonged heavy rains.

Sandy soil is better for crops when there is a great deal of rainfall, since water percolates through it more easily. It has good moisture-holding capacity but does not become waterlogged as easily as clay. Its production is somewhat less than that of clay in normal years, but its overall long-term production is higher. Thus, it is the most consistently productive soil type. Sandy *tierra negra* is preferred for tomatoes, since they are harmed by too much moisture as well as too little.

Clay is heavy and hard to work, but is the richest soil and performs well during drought. Clay soils are preferred for corn because of their normally high productivity, but they are susceptible to waterlogging if there is heavy rain at the beginning of the season. In the worst possible year, one which is too wet during the early summer and dry during the remainder of the growing season, corn production on clay soils can be as low as 500–750 kg/ha.

Of the land within the *ejido* of Chalcatzingo, 60 percent is *tierra negra* de

arena, 20 percent is *tierra negra* de *barro*, 10 percent is *tierra amarilla*, and another 10 percent consists of trails, streams, and other uncultivated areas.

Soil and crop preferences represent a system of cultural adaptation of crops to given soil conditions which reflects both the moisture and nutrient requirements of the crops and the characteristics of the soil. Although most farmers recognize the ideal strategy of planting crops in all three types of soil, they do not always have access to them. Therefore, they must contend with production which varies from year to year depending on climatic conditions. They try to remember rainfall conditions from past years and use these data to predict succeeding years, usually with little success, as also found by Anne Kirkby (1973) in Oaxaca.

Table 26.1 shows the three main soil types and the crops which are preferred for them based on informants' responses. Since not all farmers have access to all soil types, the table represents a desirable, but not necessarily actual situation.

Corn will grow well in all soils, but the preference for clay soil indicates that farmers try to fit the higher moisture requirements of corn with the good retention capacity of clay. This preference also indicates that drought is a more typical condition than an excess of moisture and that farmers try to minimize its effects by planting on clay soil.

Beans and squash when planted as separate crops require high moisture and are not preferred on *tierra amarilla*. Peanuts have lower moisture requirements, are easier to harvest, and grow better in the more friable soils. Tomatoes are the most sensitive crop and are planted only on sandy *tierra negra*.

As part of our research, soil fertility was measured on fourteen sample plots with a Sudbury testing kit. This test is not as accurate as some others but was the most practical. It gives results in the form of percentage of deficiency from an arbitrarily defined optimum and provided an objective measure of the relative fertility of the different soil types at

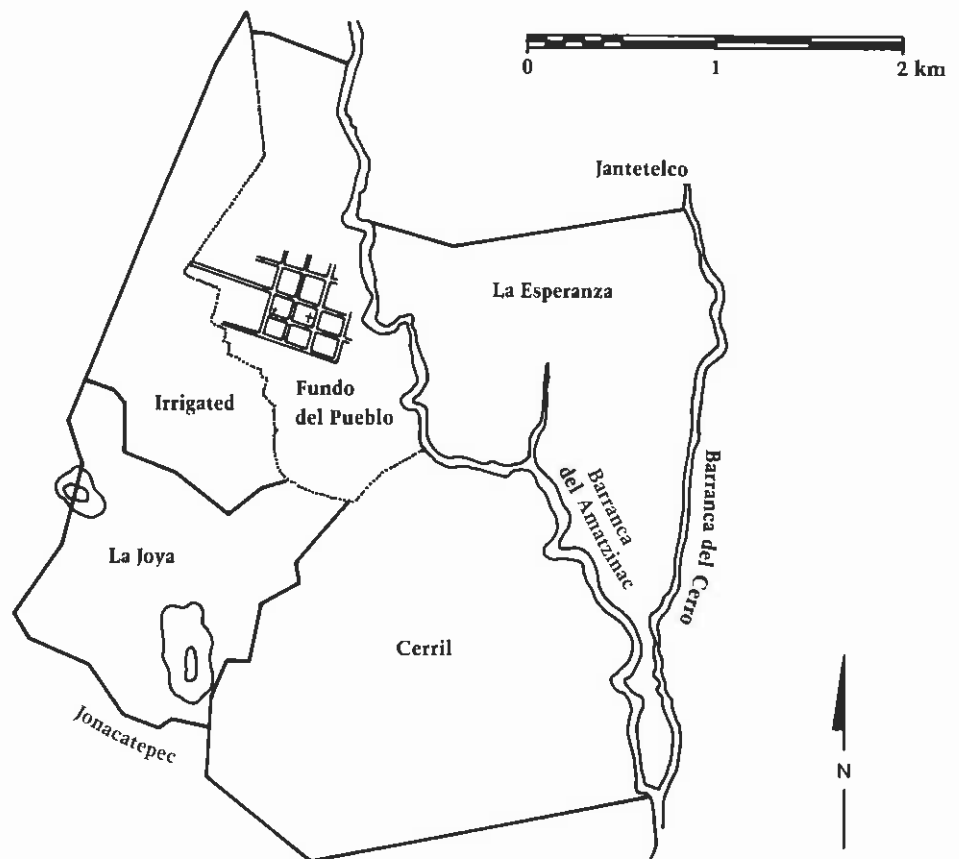


Figure 26.1. Land grant map of village of Chalcatzingo.

Chalcatzingo. The data are presented in Table 26.2 as average deficiencies for nitrogen (N), phosphorus (P), and potash (K). This table shows the greater fertility of *tierra negra*, especially in respect to phosphorus as well as to nitrogen, an important nutrient for corn.

In spite of the limited conservation practices which modern farmers utilize, the soil at Chalcatzingo is relatively fertile. Apparently the differential fertility of *tierra amarilla* and *tierra negra* soils, coupled with their different water-retention characteristics, leads to differences in production between the two.

CROPS

Although some differences in the ecological requirements of various crops can be determined from the interrelations of plants and soils, detailed studies of each crop are necessary to relate the tolerance ranges, productivity, and problems of each crop in the traditional agricultural system.

Corn

In recent years hybrid corn has been planted experimentally by a number of farmers, but it has not met with a great deal of success. While its potential productivity is ultimately greater than that of the indigenous variety, it is difficult for the Chalcatzingo farmer to achieve that potential. Although hybrid varieties were not seen in the Chalcatzingo fields, they were being grown in irrigated fields elsewhere in the valley.

Most Chalcatzingo farmers stated that they did not plant hybrid corn because they did not like the taste or consistency, but there are other reasons for its lack of success. For optimum production, hybrid corn needs careful attention to water requirements and fertilization. Irrigated land is a practical necessity, and chemical fertilizers must be used to insure maximum production. Fertilizers are expensive, complicated to use, and difficult to purchase and transport; therefore, they are not used on a large scale.

Most corn today is planted without prior fertilization, but fertilizer may be applied after the plants reach 0.5–1.0 m in height. The farmers do not fertilize the soil, but fertilize the individual surviving, healthy plants. Small (single pinch) applications of fertilizer applied to each plant reduce costs and insure that none of the fertilizer will be wasted on plants which will not produce.

The failure of hybrid corn to compete with local varieties indicates the importance of the *strategy* of the farmers at Chalcatzingo. This strategy is not optimization of production, but "satisficing" (Simon 1957). That is, the farmers try to meet a preset production goal with a minimum of inputs. The goal is not maximum production, but only enough to meet the farmer's needs.

Hybrid corn requires optimization, for it demands high inputs of fertilizer, labor, and irrigation to achieve maximum productivity. If these inputs are not provided, the yield of hybrid corn is less than that of the traditional variety. Farmers therefore find that hybrid corn requires a different and unacceptable strategy. Since most farmers attempting to use hybrids cannot meet the increased input demand, their production decreases and they soon return to the traditional variety.

The indigenous corn, *maíz criollo*, is ultimately less productive than hybrid varieties, but is more broadly adapted and will produce better under adverse climatic conditions. Production figures for *maíz criollo* are given in Table 26.3 and Figure 26.2. *Criollo* is related to *pepitilla* (Wellhausen et al. 1952) and is common in Morelos and Guerrero. The cobs average 15–20 cm long and are slightly tapered from butt to tip. Rows average fourteen or more, but a few twelve-rowed ears are found. Kernel color

is white to light yellow, with some blue or black kernels. The kernels end in a turned-over apex or beak which is a distinctive feature of this variety. The rows are widely spaced, straight, and not interlocked.

Criollo differs from the corn at nearby Tepoztlan. Edgar Anderson (1951) felt that the corn there was derived from west Mexico rather than central Mexico. The corn at Chalcatzingo shows little evidence of genetic connections with west Mexico, perhaps indicating the existence of different cultural interaction spheres within Morelos.

Archaeological samples of corn preserved in Cave 2 at Chalcatzingo are of a completely different variety than *criollo*. Samples were collected from mixed deposits dating from the Postclassic to the early historic period. Only three kernels of beaked corn (*criollo*) were found in the sample of thirty-one kernels. The archaeological sample cobs have a mean row number of twelve and are significantly different in morphology from the modern type. They are related to the *naltel-chapalote* complex, an ancient variety common to southern and eastern Mexico.

Beans

Two types of beans are grown today at Chalcatzingo. *Enrededor* is a pole bean, much like "Kentucky Wonder." The seeds

Table 26.1. Preferred Crops for the Different Soil Types

Soil Type	Crop				
	Corn	Beans	Squash	Peanuts	Tomatoes
<i>Tierra amarilla</i>	(+)	—	—	+	—
<i>Tierra negra</i>					
<i>Arena</i>	(+)	+	+	+	+
<i>Barro</i>	+	(+)	+	—	—

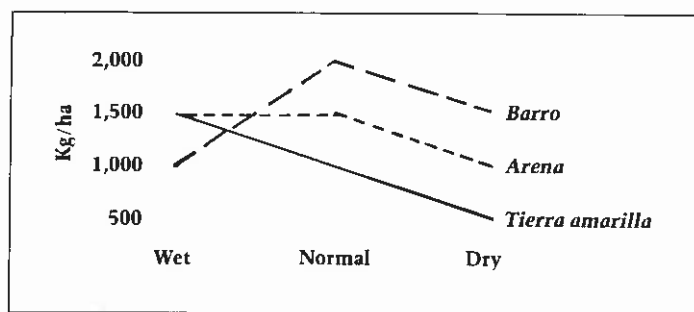
Plus signs indicate preferred crops. Plus signs in parentheses indicate acceptable conditions. Minus signs indicate unacceptable conditions.

Table 26.2. Average Mineral Deficiencies in Chalcatzingo Soils

Soil Type	Nitrogen	Phosphorus	Potash
<i>Tierra negra</i>	4.0	8.0	4.0
<i>Tierra amarilla</i>	5.0	10.9	4.6

Table 26.3. Average Corn (*maíz criollo*) Production (kg/ha) for Differing Soil Types and Rainfall Conditions

Soil Type	Rainfall Conditions		
	Wet	Normal	Dry
Tierra amarilla	1,500	1,000	500
Tierra negra			
Arena	1,500	1,500	1,000
Barro	1,000	2,000	1,500

**Figure 26.2.** Average corn (*maíz criollo*) production (kg/ha) for differing soil types and rainfall conditions.

are light brown. Although there is no standard pattern for planting, beans are mixed with the corn at a rate of about 1 plant per 10 cornstalks, or about 200–300 plants per ha. One interplanted hectare yields about 175 kg of beans.

Frijol chino, a highly productive bush bean, is also planted, usually alone, not intermixed with corn. One hectare produces about 1,750 kg of seed. Most farmers do not plant *chinos*, since they require a great deal of additional labor and their harvest tends to coincide and interfere with the harvest of corn.

Squash

Three types of squash are planted. The most common, *calabasa champolla*, is interplanted with maize. This squash is grown only for its seeds, which are toasted and eaten. *Champolla* produces about 300 squash per ha which yield about 150 kg of seed.

The two other kinds of squash are grown in small numbers. *Calabasa dulce* is kept through the dry season for use as a boiled vegetable, served with a thick honey syrup. *Calabasa castilla* is grown by a few farmers for the blossoms, which are used in soup. Only a few plants of both types were seen in the fields during 1975.

Peanuts

Peanuts are the major cash crop for most farmers. They are planted in May, just before the beginning of the rainy season, and are harvested in November before the corn harvest. Planting and cultivation of the crop require a minimum of labor, but the harvest is arduous and time-consuming. At harvest the field is first plowed, and the plants are uprooted and stacked. The peanuts are then picked from the vines. Although it takes five days for the harvest of 0.5 ha, the work is simple, so all members of a family usually participate. Production is approximately 1,750 kg/ha, and at 1975 prices of 2 pesos/kg, 0.5 ha produced enough to fill half of the cash needs of an average family.

Tomatoes

Tomatoes are grown as a cash crop, in either irrigated or *temporal* fields. Farmers plant commercial hybrid seed. *Temporal* crops must be staked to prevent the fruit from touching the moist ground and rotting. Therefore, they require a large investment in stakes and wire. Stakes can be cut on the *cerros* or may be bought locally or from peddlers who cut them in the upland forests.

Irrigated tomatoes are grown in La

Esperanza on some of the better soils. These crops are planted in August and are harvested in November or December when prices are higher. The late crop does not need to be staked, as the ground is not moist then. Although most crops are sold in nearby markets, some farmers have taken their tomatoes to markets in Cuernavaca, Puebla, and Mexico City.

Tomatoes are a difficult crop because they are very sensitive to variations in moisture, temperature, and soil fertility. There is also trouble with disease, but this can be mitigated by repeated treatments with fungicide. Yields are high, however, with 0.5 ha producing 4,700 kg of tomatoes over three harvests during and after the *temporal* season. Irrigated tomatoes commonly yield less, due to the scarcity of water in late November and December.

In 1975 a yield of 4,700 kg of tomatoes sold at 10,800–13,500 pesos. From this amount must be deducted the wages of field workers and costs of fertilizer, stakes, wire, fungicide, and insecticide. The net income from 0.5 ha of tomatoes amounted to 5,000 pesos or about one-half the value of the crop.

Other Crops

Other crops which are sometimes planted are onions, chiles, *tomatillos* (husked tomatoes), and watermelons. None of these are common, although some farmers plant them every few years or so. Chiles are grown on *temporal* plots by only one farmer in the village. Onions are occasionally grown on irrigated land. Melons and *tomatillos* are sometimes grown on *temporal* land, or may be planted in small quantities in irrigated fields. None of these crops, with the exception of chiles, are of major economic or subsistence importance.

TRANSPORT

The transport of the harvest from the field to the house plot and from the house plot to the market is an important consideration in village agriculture today. With a normal harvest of sufficient size to maintain a family, a farmer may spend ten days transporting the crop from the fields to the house. More important, transport to the market is usually in the hands of an intermediary who owns a truck and sometimes a stall in the market. The cost of transportation is high and almost entirely outside the farmer's control. The only possible lever-

age which can be gained by the farmer is by establishing a personal relationship with a trucker, either on the basis of friendship, *compadrazgo*, or long-term economic relations.

STORAGE

Storage is, of course, essential for household units, given the periodicity of the harvests. Household supplies of corn, beans, squash seeds, and fruits are stored in a *cuexcomate*, a circular clay structure with a thatched roof (Fig. 26.3). The *cuexcomate* is built atop a stone base which allows for the circulation of air. It is an efficient storage structure which allows the corn to dry fully and protects it from insects and mildew. Corn is shelled before storage and may be drawn out either from the top or from an opening on the side. Corn withdrawn from the *cuexcomate* six months after harvest usually has no visible insect damage.

Efficient means of storage such as the *cuexcomate* represent a marked increase in the stability of peasant agriculture. Their occurrence in the archaeological record should mark an important shift in the strategy and capacity of the subsistence system, with decreasing emphasis on gathered foods and more dependence on agriculture. However, to date no definite examples have been found archaeologically.

Cuexcomates continue to be made at Chalcatzingo, although there are now only two men who are considered to be experts in their construction. The efficiency of the *cuexcomate* for corn storage insures a continuing demand.

AGRICULTURAL CYCLE

The agricultural cycle is largely determined by the seasonal nature of the climate. With the exception of irrigated crops, farming activities occur just before,

during, and after the summer months. Harvests are from November until the end of December. Within the constraints imposed by the environment, there is a rigid schedule of activities during the farming season.

Figure 26.4 shows the annual agricultural cycle for the major crops at Chalcatzingo. There are two corn harvests. The first, when the corn is still green, strips the stalks of the leaves (to use as fodder), but the ear is usually left to dry (although sometimes harvested green for immediate use). The second harvest is of the dried ear of corn.

It can be seen that the schedule for the basic crops, including peanuts, minimizes conflict. Peanuts are planted earlier than corn and are harvested between the first and second corn harvests. *Temporal* tomatoes also fit the schedule of corn, providing an alternative cash crop but one which involves more investment and risk. Irrigated tomatoes seem to fit the schedule, but as they require high labor inputs at the same time as the second corn harvest, when labor is in short supply, they are not necessarily a viable alternative.

Scheduling of agricultural activities is a major constraint on the agricultural system. The present schedule minimizes conflict but does not permit a large number of viable alternatives. Farmers who desire more cash income cannot produce more of the traditional crops without incurring labor shortages and scheduling conflicts; therefore, they are faced with a situation in which a shift to an entirely different strategy is necessary.

LABOR

At the most basic level, labor is organized along kinship lines. As Eric Wolf (1966) has pointed out, the family is the unit of production and consumption in a peasant society. In Chalcatzingo, however, there is a rather fluid boundary between the kinship units which are important for economic relations. The nuclear family is possibly the most strongly bounded unit, but beyond that the kinship units which are actualized in economic relations are highly flexible.

The critical labor periods are planting and harvest. Planting must be accomplished within a relatively limited period, or the entire schedule can be thrown off. Although one person can manage all of the jobs alone, time pressure causes conflict in the scheduling of activities.



Figure 26.3. *Cuexcomate* in house yard in the village.

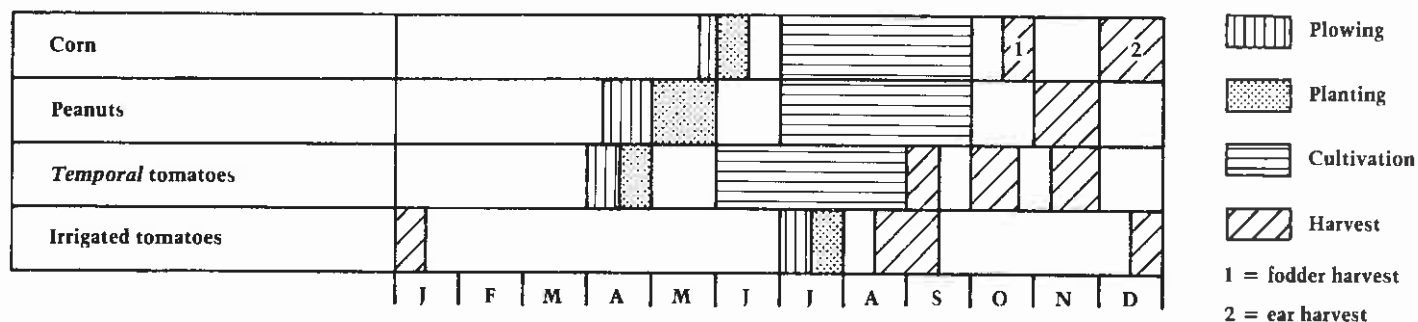


Figure 26.4. Annual agricultural cycle.

The minimal unit for farming is said to be two people, but this is a baseline which applies only at certain times. In fact, work groups of less than three persons are rarely seen in the field.

The most common task group is a man and his brothers or sons. One man plows and the others clear the weeds or sow the seeds. Often two or more brothers share both the labor and the harvest of a field. These arrangements are made on the basis of verbal agreements. The produce from the field may be pooled or divided, depending on the living arrangement and the type of storage facilities available.

Beyond the family unit, other kin ties may be called into play to accomplish given tasks. Often more distant relatives agree to a share of the crop in payment for labor for part or all of the season. This arrangement, called *en medias*, has benefits for both parties. On the one hand, the owner of the plot does not have to pay a fixed amount if the harvest is poor, and he is assured of the fact that his laborers will have an interest in the jobs. On the other hand, the worker who may be without land has the opportunity to invest his labor without the chance of disastrous loss. If this form of contract is possible, it is preferred by most parties. Another important fact is that the relationship between the workers is not one of employer-laborer, but is more reciprocal and equal. Such relationships are generally preferred over wage labor.

Contract wage labor is the third form of organization. In this case, a verbal contract concerning the type of work and the amount of pay is agreed upon before the beginning of the agricultural season or before the particular task. In 1975, payment ranged from 35 to 45 pesos per day, depending on the skill of the laborer and the job to be done. Although workers can be hired at any time, the most com-

mon need for labor is during the harvest season in December. Due to the rigid schedules which govern most of the farmers in the village, there are often shortages of labor during this period. In cases when labor is insufficient, the completion of the job must be delayed, causing further schedule conflicts or delaying the sale of the crop.

Consideration of the available labor supply and the timing of activities can be used to differentiate traditional and cash farming. The activities of traditional farming are scheduled so that conflicts are minimized. However, cash farming, especially of irrigated tomatoes, results in overlaps between the periods of traditional farming activity and those for the cash crop at the critical harvest period (see Fig. 26.4).

CONSUMPTION

Anne Kirkby (1973:89-90) determined that the average household of five persons in Oaxaca produces 2.4 metric tons (2,400 kg) of corn per year, half of which is used for subsistence and half as a "salable excess." At Chalcatzingo, the average consumption for a family of five (two adults and three children) is between 800 and 1,000 kg per year of corn. This figure was arrived at by questioning farmers as to their subsistence needs and by asking their wives how much corn they needed per day and then calculating the yearly consumption. Both estimates were almost the same within a family.

To the consumption of corn can be added a minimum of 175 kg of beans, 100 kg of squash seed, and chile in amounts which were not precisely determined. At Chalcatzingo, peanuts, rice, and other foodstuffs should be considered, as they make up an important part of the yearly consumption.

As Kirkby's estimates show, peasant

agriculturalists do not only produce for consumption but must also meet other demands, such as a replacement fund (seed for the coming year), funds to maintain social relations, and funds for rent (Wolf 1966).

In 1972 and 1973, the average family of five at Chalcatzingo spent 3,000-5,000 pesos per year on food, clothing, and other items. Most expenses were not fixed but varied widely from family to family and from time to time. Given the average landholding of 3 ha, with a production of 1,500 kg/ha of corn, the average production was about 4,500 kg per family. If 1,000 kg was consumed and the other 3,500 sold for 1,000 pesos per metric ton (1972 prices), the family had a cash income of 3,500 pesos and had minimally met its needs. In addition, wage labor, the sale of fruits or other gathered products, or the sale of craft items can produce an income in excess of needs.

At worst, given the same amount of land and the minimal production rate of 500 kg/ha, the average family still produces 500 kg of corn beyond its subsistence needs. Therefore, in times of extreme stress, the family remains secure in meeting its subsistence needs but not its cash needs. During such times, family members seek wage labor outside of the village in order to meet their cash needs. If this is not possible, they try to reduce their expenses.

The Chalcatzingo data emphasize the contrast between the "breadbasket" state of Morelos and other Mexican states. The average family at Chalcatzingo consumes directly less than one-third of the agricultural production of its land, and the surplus is available for the support of additional persons through trade, taxes, or other means. Even in the worst of years some surplus is available, and with the reactions of different types of land

to differing climatic conditions, careful management through spatial averaging or alternative agricultural strategies can provide even more. Although the productivity of agriculture is a function of the environment, the crops, and the technology, it is clear that a major factor in determining the ultimate production is what Wolf (1966:77) calls the "social imperatives."

DECISION PROCESSES

The present agricultural system of Chalcatzingo represents the outcome of a long history of individual decisions. At one level, agriculture can be viewed as a complex, goal-oriented, homeostatic system, but at the personal level, agriculture is the result of individual decisions made on the basis of personal goals and constrained by factors in the perceived environment. Although the latter perspective is largely beyond the reach of archaeological data, the individual decision-making procedures do have important consequences for the interpretation of prehistoric subsistence and settlement systems.

The goal of most farmers at Chalcatzingo is to provide their families with food and the required necessities for maintaining their households. To achieve this in the face of the changing productivity of their land takes considerable knowledge and planning. The important constraints on the individual farmer can be determined by an analysis of the decisions which are made and the alternatives which are available.

The diagram of the sequence of decisions and their consequences is shown in Figure 26.5. Beginning with the primary decision—the setting of the production goals for the year—the succeeding decisions are indications of the constraints on production. As described previously, land, labor, and capital are the critical factors which determine the amount of land cultivated. The individual farmer must compromise his goals with what, in reality, is possible. If land, labor, or capital are lacking, the farmer must either acquire them or must reset his goals accordingly.

As long as agricultural activities remain confined to the household, there are maximum limits on the amount of land which can be worked. With most families, land is the critical variable in the system. The average landholding is about 3 ha, but it is possible for a farmer

to cultivate 4 ha without undue difficulty. Therefore, the problem for most farmers is to either acquire more land or reset the production goals.

Labor requirements are easier to meet, as there are numerous means available for sharing or hiring labor. Labor inputs are, of course, variable throughout the agricultural season but tend to be minimized at the planning stage. Careful planning plus the rigid scheduling system tends to minimize labor problems. Similarly, capital is not a major problem for traditional farming since a minimum of capital investment is involved.

Comparison of the decisions made at Chalcatzingo with those made by farmers in Oaxaca (Kirkby 1973:56ff.) shows points of similarity and difference between the two areas. Oaxacan farmers also are not oriented toward maximal land use but tend to satisfy fixed goals. There, farmers calculate the amount of land needed, the amount to be fallowed, and the distribution of the crops. However, in Oaxaca the farmer also decides on the date of planting, the density of the crops, and the varieties of corn planted. At Chalcatzingo, none of these latter decisions are made; rather the Chalcatzingo farmer makes decisions at the strategic level.

As indicated by the diagram, the goal-setting decision is influenced by a number of factors, many of which tend to change from year to year. The farmer's strategy, however, is a major factor in determining the agricultural goals, and is not significantly influenced by yearly variation in the contributing factors. Therefore, it is possible to determine two logical levels of decision making, a higher "strategic" level resulting in the setting of goals and the "tactical" level involving the means of achieving those goals. With the exception of the goal-setting decision, the majority of decisions in Figure 26.5 are tactical, as they involve the means for achieving the goal once it has been set.

Strategic decisions are determined by the amount of subsistence production necessary, the sociological imperatives, and the sociocultural constraints which are in operation. Four distinct choices can be made at the strategic level. The farmer may follow the traditional strategy of producing partly subsistence and partly cash crops, he may produce only subsistence crops, he may produce only cash crops, or he may not engage in agriculture at all.

Strategy Alternatives

If a subsistence strategy is followed, approximately 1 ha of land is sufficient to supply a family of five if cash expenditures are kept at a minimum. Very few families are or have been in such desperate circumstances that they must rely on subsistence agriculture alone; however, it has happened in the past and is likely to occur again. Such a situation might occur with the incapacitation or death of the head of the family.

Few families practice no agriculture. Since the termination of the *bracero* program, most family heads have not chosen to restrict themselves to wage labor alone, although an exclusive wage labor strategy may be followed by those without access to land. The majority of wage laborers are young adults who migrate to the city. A mixed strategy of farming plus wage work is also possible for those with special skills, such as farmers who raise subsistence crops during the agricultural season and work for wages as masons, etc., during the dry season.

The most common form of agricultural strategy is the traditional pattern of mixed subsistence and cash farming. Due to the scheduling system and the distribution of land within the village, some farmers attempt to grow a crop of irrigated tomatoes in addition to the usual crops of corn and peanuts. The tomato crop matures in late December during the corn harvest. While the mix of corn and peanuts is typical of Chalcatzingo, only 6 percent of the farmers attempt to grow irrigated tomatoes each year.

Since the tomato crop is viable in terms of scheduling, it would seem that the increased investment in terms of cash and labor is the major constraint on its acceptance. Tomatoes are a risky crop, and many farmers complain that they are difficult to grow. In 1975 all but one field of irrigated tomatoes in La Esperanza had been affected by disease and failed to produce salable crops. The only productive field at that time was owned by a farmer who cash crops on a full-time basis and who had stopped the blight by daily applications of fungicide. In his case, the reduction of risk was dependent upon his experience with the crop and his ability to vastly increase his labor and cost inputs. Not all risk with tomatoes will respond to increased labor, however. Too much or too little rain may significantly decrease the production, as will high temperatures, improper fertil-

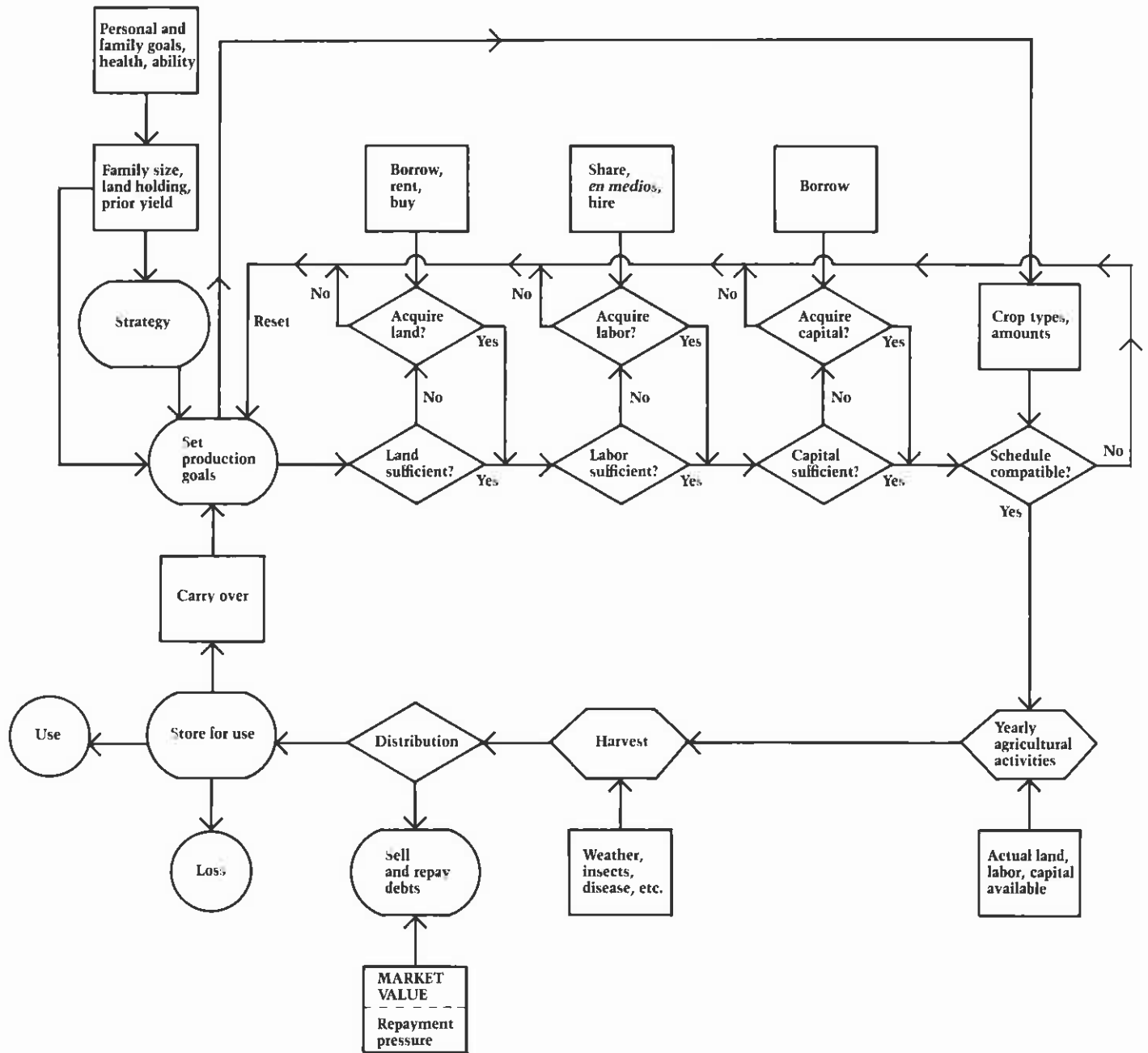


Figure 26.5. Agricultural decision-making flow chart.

ization, or other complications.

The fourth alternative is the planting of cash crops alone. This is a very limited possibility today, due largely to the small amount of irrigated land available. At other villages in the valley upstream from Chalcatzingo, farmers who have access to irrigated land often grow cash crops of onions, tomatoes, chiles, beans, or sugarcane. At Chalcatzingo, there are only two farmers who regularly plant only cash crops. Another four farmers grow only cash crops during some, but not all, years. Since failures with cash crops are often total when they occur, this strategy is not viable without some sort of backing. Those villagers planting only cash crops were able to fall back on kinsmen who provided them with food and cash in case of a total crop failure.

Alternative Tactics

Measures which Kirkby (1973:54–59) found to vary in Oaxaca, such as date of planting, plant spacing, distribution of crops on different soil types, and the area planted, are almost without variation at Chalcatzingo. The system here is marked by stability, a lack of tactical decision-making, and very little game-playing.

Planting dates are set by custom; the reasons for the dates are unknown and planting at different times is not done. The planting dates are not changed, although farmers try to predict the beginning or intensity of the rains. Since only one type of maize is commonly used, there is no attempt to plant early and late crops or insurance crops, as is the case with Oaxaca and Veracruz (Kirkby 1973; Coe 1974).

Peanuts are planted from May 1 to May 30, depending on when the plowing is done. Maize is planted from June 13 to June 23. Beans and squash are planted at the same time as corn. Irrigated crops such as tomatoes, chiles, and onions are planted from August 2 to August 5.

The inflexibility of the planting dates represents a subtle working out of the seasonality (environmental timing) of climatic factors and the requirements of individual crops. The planting dates minimize the effects of climatic variation and reduce conflicts of scheduled activities. The June planting dates for corn are late enough to insure that the rainy season has begun, but early enough to avoid damage to the plants in the dry period in August. Although corn could be planted earlier in some years, false starts of

the rainy season are common. In 1972, the rains seemingly began in May, but there followed a month-long dry period until the middle of June. Had corn been planted with the rains in May, it would not have survived. On the other hand, if corn is not planted early enough, it does not have sufficient storage capacity to enable it to survive the August dry period.

Similarly, if corn were planted earlier, then the timing of the harvest would conflict with the harvest of peanuts. If it is planted later, green corn would not be available during the summer months (when there is the greatest food shortage), and the harvest would reduce the time available for wage labor and would probably result in lower prices for the corn that is sold. Therefore, variability in planting dates, because of the systemic nature of agricultural activities, would have resultant effects throughout the agricultural cycle. Dislocations at the beginning of the year bring scheduling conflicts later.

In the case of other potential sources of variability such as plant spacing, other explanations must be sought. Plant spacing is determined by the techniques of plow agriculture (Fig. 26.6). The planters follow the plow and every two steps drop the seed and cover it. Row spacing is determined by the spacing of the yoke of oxen. Plant spacing measured in three fields averaged 85.6 cm with a range of 56–114 cm and a variance of 8.4 cm. Row spacing averages 86 cm with a range of 80–100 cm and a variance of 7 cm.

Plants average 4.1/m². These figures were found to remain constant despite differences in soil type and location. The data suggest that plant and row spacing are not varied as the result of tactical decisions.

The distribution of crops within the Chalcatzingo area is also not the result of a tactical, event-matching decision but is determined by strategic decisions made before the agricultural season begins. The decisions are made on the basis of how well the production of the preceding year met the actual needs of the farmer. The distribution of crops, the particular mix of subsistence and cash crops, depends upon such factors as family size, expected cash needs, production in the preceding year, and important personal factors such as health, ability, and the desires of each farmer. This analysis of Chalcatzingo concurs with that of Oaxaca by Kirkby (1973) that a basic constraint on the productivity of the agricultural system is the desire on the part of the farmer to meet his expected needs with a minimum of labor expenditure.

Therefore, the goal of the agricultural system at Chalcatzingo—to provide a consistent and adequate supply of food and crops for sale—is met despite environmental variability. Farmers attempt to estimate their needs and set their production goals at the beginning of the season. Once the season has begun, there is very little game-playing or variation in techniques since farmers are constrained by their labor supply and the schedule of agricultural activities.



Figure 26.6. Traditional and modern agricultural methods.

Due to this rigidity of the farmer's schedule and the limited amount of land and labor available, there are few viable alternatives to the traditional agricultural system. Although farmers experiment with new crops and techniques, change seems to occur only when a new *strategy* is attempted. The success of these alternatives is largely dependent on the nature of the larger socioeconomic system of which Chalcatzingo is only a part.

IMPLICATIONS FOR AGRICULTURAL DEVELOPMENT

Studies of the modernization of peasant agriculture fall into two broad categories: those which take an evolutionary approach and those which emphasize the dependence of peasant farmers on the world capitalist economy (Long 1977:9). The former stress the role of sociocultural factors such as traditional values and ritual obligations which are seen as barriers to modernization (Foster 1962; 1965; 1967; Rogers 1969). Dependency theorists, on the other hand, see peasants as rational decision-makers who are barred from development by the economic domination of the world economy (Baran 1957; Frank 1969a; 1969b; Matos Mar et al. 1969; Stavenhagen 1969).

At Chalcatzingo neither ritual obligations nor traditional values seem to present barriers to modernization; yet the barriers which do exist are not as simple as the dependency theorists suppose. While it is the case that farmers are for the most part rational, efficient, and profit-oriented, constraints on development exist at many levels. These have been enumerated with the consideration of decision-making and alternatives which exist at the tactical and strategic levels. The basic parameters of the system are the amount of land available for agriculture and the demographic factors which determine labor availability and production goals. Ecological constraints are revealed in the character of the climate and the soils and in the requirements of different crops. The scheduling system integrates the lower-level parameters and variables into a coherent functional whole. The socioeconomic context determines the viability of the system in terms of the national economy.

Experimentation with new techniques and crops is constant at Chalcatzingo, but most attempts to change do not prove viable, given the constraints of the

system. Under the conditions of farming at Chalcatzingo, there is little margin for error, as most farmers do not have the resources to survive either a single crop failure or a year of low prices. Mechanisms to decrease risk are simply not available to the majority of families. Therefore, most farmers follow the conservative strategy of traditional agriculture which will meet their needs with a minimum of risk.

IMPLICATIONS FOR ARCHAEOLOGY

Applying these conclusions to prehistoric agriculture, it is evident that the most likely cause of change in adaptive strategies is the character of the selective pressures in the socioeconomic environment, given the stability of other factors. Agricultural intensifications such as the construction of terraces and water-control systems during the Formative were, I believe, in some way related to contact with the Gulf Coast. But, following Flannery (1968:79–80), the problem is to explain changes in subsistence strategies without invoking Olmec migrations, missionaries, or conquests. Similarly, the system of long distance trade in exotic raw materials (Flannery 1968; Grove 1968c) is not likely to have affected the subsistence base.

Both Flannery (1968:105–107) and William L. Rathje (1972) have proposed explanations for the growth of Formative cultures which emphasize the process of economic symbiosis. Both have proposed the import of raw materials into the Olmec heartland. In turn, the Olmec may have exported religious knowledge, symbols, and "status trappings" (Flannery 1968:105) or "systems of social integration" (Rathje 1972:386–387). It is difficult to specify how either symbols of status or ideas of organization could have been responsible for the massive building projects at Chalcatzingo. What is lacking in both models is a means of social control.

The hypothesis I propose here is that calendric knowledge and associated rituals may have provided the missing mechanism. Scheduling, especially of the initiation of agricultural activities, is the single most important factor determining the viability of agricultural innovations. Scheduling organizes and determines variables such as the amount of land planted, the distribution of crops, and the type of crops. In order to be accepted, new techniques and crops must be compatible

with the scheduling system.

Given the fact that farmers are poor predictors of the onset of the rains, individual scheduling decisions would tend to reduce overall production and lead to a diffuse pattern of activities. If, on the other hand, scheduling decisions were vested in a few individuals with esoteric knowledge of calendrics, predictability would be increased, crop losses reduced, and activities synchronized. Calendric regulation of the agricultural cycle would therefore provide the local elite with a powerful means of social control, a means whose accuracy was demonstrable and reinforced by ritual. With such controls, the elite could gain the leverage necessary to begin the processes of agricultural intensification and control the subsistence system.

Calendric organization of the agricultural cycle also leads to the definition of non-agricultural periods. Without scheduling, farmers may tend to scatter their non-agricultural activities throughout the year, as at Tepoztlan (Lewis 1951:150–153), leaving no time available for community activity. Calendrically defining a non-agricultural period would have made labor available for the massive construction projects which were carried out at Chalcatzingo during the Formative period. Introduction of a calendar may have been a first step for a group of specialists establishing social control. The emphasis of some carvings at Chalcatzingo on weather "control" and fertility (Chapter 10, Area I-A monuments) suggests that such an event may have occurred with Olmec contact.

RESUMEN DEL CAPÍTULO 26

El sistema agrícola en Chalcatzingo en el presente es el resultado de una larga historia de decisiones individuales tomadas por los campesinos con la intención de proveer de alimento a sus familias y poder cubrir otras necesidades. Las variables que entran en juego al hacer las decisiones en materia agrícola son muchas—tierra, labor, capital, requerimientos de los cultivos, disponibilidad de almacenamiento y facilidades de transporte, etc. La tierra agrícola es ejido, o es de propiedad privada. Una pequeña cantidad es de riego y la mayoría de temporal. Los campesinos distinguen dos tipos básicos de suelo, tierra negra, el suelo orgánico más productivo que se subdivide en los tipos arena y barro, y la tierra amarilla. Ciertos cultivos serán más productivos en uno o en otro tipo de suelo, y en tierra irrigada o en la de temporal, pero dado que todos los campesinos no tienen acceso a todos los tipos de suelo y tierra, deben escoger qué cultivos emprender y en dónde, cada estación del año, en función de las necesidades que tengan.

Los cultivos en Chalcatzingo incluyen tanto los de subsistencia como los de venta. Los cultivos de subsistencia básica son el maíz, los frijoles, y la calabaza. El maíz es de la variedad indígena, maíz criollo, el cual está relacionado con el pepitilla. El maíz híbrido podría ser más productivo, pero no ha tenido éxito porque requiere grandes inversiones de capital (en la forma de fertilizante), labor, e irrigación para lograr productividad máxima. Los cultivos de venta importantes son los cacahuates y los jitomates, los cuales requieren una inversión de trabajo bastante pesada, y los jitomates además necesitan mayor inversión de capital en forma de cajas, antiplagas, e insecticidas.

El trabajo puede ser un factor crítico en la agricultura dado que la cantidad que de él se requiere varía a lo largo de la temporada agrícola. Los periodos críticos de trabajo son la siembra y cosecha, los cuales son diferentes para los distintos cultivos. El campesino debe escoger sus cultivos basándose no sólo en los cálculos de sus necesidades, sino también con respecto a esperar los menores conflictos posibles al pretender utilizar el trabajo familiar o asalariado. Las actividades agrícolas tradicionales han sufrido una evolución a lo largo de un periodo grande de tiempo y han lle-

gado al punto en que los problemas de programar el trabajo debieran no presentarse. Sin embargo, el cultivo para venta tiene como consecuencia el que tenga que sobreponerse a los periodos agrícolas tradicionales, con los cuales entra en conflicto precisamente en el momento crítico de la cosecha.

Dadas todas estas restricciones, el campesino tiene que hacer frente cada año al problema de escoger entre cuatro estrategias básicas: emprender sólo cultivos de subsistencia, emprender sólo cultivos de venta, emprender ambos cultivos de venta y subsistencia, y no emprender ningún cultivo. La estrategia seguida más comunmente es la tercera, o sea emprender ambos cultivos de subsistencia y venta con objeto de poder alimentar tanto a la propia familia, como también tener un ingreso adicional, aun cuando los campesinos con ello tienen que hacer frente a problemas de programación de la tierra y de empleo del trabajo en una situación de conflicto entre dos estrategias relativamente inflexibles.

Una vez hecha la decisión de qué estrategia seguir al principio de la temporada agrícola, cada campesino tiende a seguir las prácticas agrícolas de costumbre desarrolladas para minimizar los riesgos de pérdida. Por ejemplo, la programación, el factor más crítico, se encuentra fuera del alcance de cada campesino una vez que decide qué cultivos emprender, dado que las fechas para la siembra están dadas por la costumbre.

Si éste hubiese sido el caso dado en el pasado, i.e., si las decisiones de programación hubiesen sido hechas no por cada campesino sino por unos cuantos individuos dotados de conocimiento esotérico sobre el calendario, ello podría ayudar a explicar el surgimiento de una élite local con un medio de control social bastante poderoso. Esta élite pudo haber determinado la programación no sólo de las actividades agrícolas sino también de las no agrícolas, i.e., públicas o ceremoniales. La introducción de un calendario, controlado por una élite en ascenso, pudo haber sido un acontecimiento principal en la evolución de la complejidad sociopolítica en Chalcatzingo.

27. Comments on the Site and Its Organization

DAVID C. GROVE

GENERAL COMMENTS

Location

The Río Amatzinac Valley is agriculturally marginal when compared to the fertile river valleys of Morelos lying to the west and the Izúcar de Matamoros valley to the east. The river, which has cut a deep barranca, has few areas of broad alluvial soils or high natural humidity. While it is possible to hypothesize that the rise of certain early centers, such as San Lorenzo on the Gulf Coast, was related to agricultural productivity and surpluses, such cannot be the case for Chalcatzingo.

The initial population of the valley by early agriculturalists most probably involved splinter groups from the Río Cuautla settlements to the west, an area with great population and land pressures. The Early Formative inhabitants of the Río Amatzinac Valley, in moving into this more marginal region, were obviously motivated in their choice of settlement locations by three major factors: proximity to accessible water, to good agricultural land, and to a variety of vegetation zones with collectable plant resources. Taking all three factors into consideration, the Chalcatzingo hillside was probably the most favorable location in the valley. A spring occurs at the bottom of the hillside, and the water of the Río Amatzinac, while in a deep barranca, is nearby and accessible. The hillslopes and the spur known today as La Joya (which lacks archaeological remains) are elevated above the valley floor and the *Pithecellobium* Woodland cover, and today are considered to be good agricultural land. The woodlands lie to the north and west of the site, Huizache Grasslands to the south, and the hills and barranca provide a further range of plant communities for exploitation.

The Community and Its Support

While Chalcatzingo was the largest valley settlement during the Early Formative Amate phase, it does not seem to have attained the size of villages to the west in the Río Cuautla Valley (e.g., San Pablo; Grove 1974b). Further data are needed on the architecture of central Mexican Early Formative period settlements before it can be ascertained whether Chalcatzingo's Amate phase mounds are unusual for the region and would mark the site as already special by ca. 1000 BC. The lack of identified public architecture outside of the Río Amatzinac Valley during the subsequent Middle Formative period suggests that Chalcatzingo may indeed have been unique or special in the Early Formative as well.

Although a few small hillside terraces may have been constructed during the Cantera phase or possibly even during the Classic period, the major terracing at the site took place during the Early Barranca subphase. The archaeological data from the site do not illuminate any of the possible causal factors behind the community decision to create the terraces. For instance, we lack fossil pollen from the Early Barranca subphase and thus are unable to recreate environmental conditions at that time. It seems probable that the terracing was not directly stimulated by observation of other functioning terraces (and their advantages) in the region, for as far as we can determine such terracing is uncommon in eastern Morelos and the Amatzinac valley.

R. A. Donkin's (1979) analysis of aboriginal terracing in the Americas provides some possible causal explanations. For example, terracing normally occurs in areas of marginal rainfall, that is, where annual precipitation is less than 900 mm (*ibid.*: 7). Such terracing not only eases the problems of cultivating hillside land but also creates a surface

which better traps and retains sparse rainfall and moisture. As noted in Chapter 2, most of the Amatzinac Valley, including Chalcatzingo, has a yearly rainfall approximating 900 mm; thus terracing would have improved moisture retention while at the same time the built-in water diversion systems protected the agricultural land and habitation areas from excessive rainfall runoff.

Michael Coe and Richard Diehl (1980: 1:387) suggest that the San Lorenzo plateau was constructed in the form of a giant bird. Donald Lathrap (personal communication) believes that at the site of Las Haldas, Peru, the terraces topographically symbolize a stylized cayman's jaw. Whether the form of Chalcatzingo's terraces had symbolic as well as practical value remains a matter for speculation. An obvious and prominent artificial topographic feature at Chalcatzingo is T-27, which forms a rectangular thumb projecting northward from near the center of the lower terraces (Fig. 4.2). Its central position suggested to us the possibility of symmetrical arrangements on the site, and this hypothesis was tested during our excavations. For instance, the site's table-top altar, Monument 22, was found just to the east of T-27. Excavations in the same area on the west, however, found absolutely nothing. No center line caches or unusual features were found by the excavations atop T-27 either. With imagination the T-27 thumb could be conceived of as the bottom lobe of a cruciform earth-monster mouth such as characterizes Monument 1, 9, or 13. In the same vein it might be significant that a line projected toward the true north from Monument 1 on the hillside crosses T-27 along its approximate center line. However, it is far from certain that the builders of the terraces incorporated symbolic motifs in the terrace constructions, or that T-27's location is due to any other reason than that

it covers a protruding ridge of bedrock and *tepetate* which extended too far northward to be covered by the regular terracing.

Other layouts on the site are of more certain importance in terms of religious symbolism. The major public structure (PC Str. 4) and the major public terrace (T-1, the Plaza Central, location of the elite residence and high-ranking burials) are situated at the upper part of the hillslopes and are close to the cleft separating the mountain's twin peaks. This placement seems clearly related to the sacred character of the mountain and the cleft.

The main settlement occurred on the terraces below the Plaza Central. Because the residences sit alone on individual terraces or field plots, spaced as much as 100 m from their nearest neighbors, we have described the pattern as "dispersed" (Chapter 6). This "dispersed" settlement spreads out from the nucleus represented by the Plaza Central terrace and its 70 m long platform mound. It is difficult to determine whether this "dispersed" or noncompact residence pattern was common for Middle Formative central Mexico, since the other archaeological data available are not comparable. Those data derive from the regional surface surveys conducted by Jeffrey Parsons, Richard Blanton, and William Sanders in the Valley of Mexico, and their conclusions depend heavily upon sherd densities and site extent for the settlement classifications (e.g., Sanders, Parsons, and Santley 1979:37–39, 55–58). The Valley of Mexico surveys define both "nucleated" and "dispersed" villages during the Middle Formative period (e.g., *ibid.*: Maps 9, 10). Dispersed villages were determined on the basis of "light" sherd concentrations, or 9–25 sherds/m² (*ibid.*:39, 56). Nucleated occupations have "light-to-moderate" or "moderate" densities, or up to 200 sherds/m². Our Río Amatzinac Valley survey (Chapter 21) used more generalized criteria, but no Cantera phase settlement, including Chalcatzingo, had greater than a "B" density (10–39 sherds/m²; Tables 21.1, 21.2).

If the Valley of Mexico criteria are used, all larger sites in the Río Amatzinac Valley ("B" density) can be classified as dispersed. But does a dispersed settlement identified on the basis of surface sherd scatter really equate with the dispersed residence pattern recovered by both intensive reconnaissance and ex-

cavations at Chalcatzingo?

Each terrace or field at Chalcatzingo has one area of dense ceramic debris which serves to identify the house location. We do not know if "dispersed" villages in the Valley of Mexico exhibit the same pattern, nor are there excavation data there to ascertain whether the residences in villages classified as "nucleated" or "compact" are actually more closely spaced than those in "dispersed" villages, or whether the "dispersed" villages lack nuclei. Before speculating on the reason for both compact and dispersed settlements in central Mexico, it must first be determined that such a dichotomy is real.

A strict dependence on surface collection data for settlement classification can lead, in this instance, to misclassification. Based upon criteria other than sherd densities, Mary Prindiville and I (Chapter 6) have suggested a very low population for Cantera phase Chalcatzingo. Our estimates do not agree with the population estimates given for the site in Chapter 21 and Appendix H. If classificatory criteria are used, our population estimate would designate Chalcatzingo a Small Village, which we believe it was. At the same time we also realize that Chalcatzingo was a Regional Center, but without the population of two thousand or more people "required" for such a classification (Table 21.3; J. Parsons 1971:22).

Chapter 6 also suggests that individual terraces or field units, each with its residence, were passed on in a hereditary manner, either through family or lineage. At Chalcatzingo the Plaza Central terrace was apparently the residential area of the site's major elite ("ruling") lineage, and the individuals buried atop PC Structure 4 may have been members of that lineage. This situation appears similar to that in later Classic Maya centers, where each plaza with its surrounding structures was the residence, ritual, and burial area of a specific lineage.

The presumed nonresidential areas surrounding each of Chalcatzingo's Cantera phase houses could have served as garden plots for food production. Using the data on modern agricultural yields from Chapter 26, and halving the yields to account for more primitive forms of maize, it is probable that a hectare of land could have supported a family of five. However, few terrace units and fields at the site approach a hectare, and most are substantially smaller. This implies that

other land in the vicinity was also farmed.

As stated above, the major terrace construction dates to the Early Barranca subphase. Included in this massive construction effort was the placement of thumb-like check dams across the two major rainwater drainages. The diversion of El Rey Drainage protects almost all upper terraces from erosion due to rainwater runoff from the Cerro Chalcatzingo. The T-15 diversion dam (T-15 Str. 1) is built onto one of the lower terraces. Because its function was ultimately to protect fields lower on the hillside from uncontrolled rainwater runoff, it can be inferred that an extensive area below T-15 was utilized for agricultural purposes. Today most of the land below the terraces is privately owned and is irrigated by a simple gravity flow system (Chapter 2). Such an irrigation system possibly operated during the Formative period as well.

It is also possible that, as a regional center, the community at Chalcatzingo received additional agricultural support as tribute or via exchange with the valley's other settlements. In addition to basic vegetable staples such as maize, beans, and squash, animal protein may also have been imported. This is suggested by the large quantity of dog bones in the refuse (Appendix J). Deer and rabbit seem to have been secondary meat supplements, although whether gained through hunting by local residents or as another import cannot be determined.

Intra-Valley Relationships

The Río Amatzinac Valley, an area differentiated archaeologically from the surrounding areas, was clearly the local interaction sphere for Chalcatzingo. Survey data (Chapter 21) have delimited northern, central, and southern valley settlement clusters, and these seem to be at least somewhat distinguishable by some artifact attributes. However, these artifact variations are minor in terms of the strong influence exerted throughout the valley by Chalcatzingo. The overall valley cultural cohesion is most apparent in ceramic types such as Peralta Orange and in the Ch1 and C8 figurines, all of which are abundant within the valley but rare or absent on the outside.

Such valley ties likewise extend into architecture. Middle Formative period public architecture is virtually undocumented in areas of central Mexico other than the Río Amatzinac Valley, where at least four Cantera phase settlements

other than Chalcatzingo have mound architecture. The presence of public architecture at these sites may mark them as secondary centers, perhaps formed through the fissioning of or marriage into Chalcatzingo's elite lineage(s). Unfortunately, the interpretation of surface reconnaissance data does not agree completely with the postulated link between mound architecture and secondary center status. Campana de Oro (RAS-20) is classified by survey criteria as a Large Village, and El Palacio (RAS-112) as a Small Village, yet both sites have mound architecture (Appendix H). Mound architecture is also found at an unnamed Small Village (RAS-164) and at Telixtac (RAS-144), a Hamlet. Teresita Majewski (Chapter 22) disagrees with the Hamlet classification of Telixtac, and the presence of the large mound there does suggest that it may have been larger and more important than reconnaissance data alone indicate.

Because of the relatively small sample of artifacts, burials, and residential structures at Telixtac and Huazulco, a question remaining to be answered is how different the sociopolitical complexity in these communities was in comparison to Chalcatzingo's. Of particular interest would be the differences in rank or status between the regional center and the various lower levels of the valley settlement hierarchy. Although not elucidated by the present data, it could be possible that everyone living in the regional center had a generally higher rank or status than persons living elsewhere in the valley.

Markers of Ranking

The analysis of ranking or status at Chalcatzingo itself has been drawn primarily from the burial data (Chapter 8). Stone crypt graves and jade artifacts were taken as the two major identifiers of high rank at the site. The presence of *cantaritos* placed inside shallow bowls with burials of apparently high-ranking individuals at both La Venta and Chalcatzingo indicates that these otherwise unimposing vessels probably became important markers when placed together as a unit in a grave. The quantity of vessels apparently meant less than a particular quality which was perceived for certain pottery items. This illustrates a problem in attempting to identify individuals' social rank through grave associations, for the cognitive value system of their culture was obviously very different from ours.

A person's rank or status and role in a society during life are obviously symbolized in a variety of ways. Most such symbolization is seldom preserved in the archaeological record. It is also possible that certain artifacts associated with burials are less indicators of individual rank and more indicators of ritual status. While the two may often correspond closely, in some instances they may not. Persons ritually sacrificed may have had a low rank in life, but the ritual associated with their death might require elaborate grave furniture.

Location and burial data suggest that Late Cantera subphase PC Structure 1d housed the site's highest-ranking elite. Thirty-eight burials were recovered from the subfloor area of this residence, almost four times the number from any other excavated house. The quantity of burials from the other residences seems low if it is assumed that the residents of each household were buried only under their house floor. As Marcia Merry de Morales has suggested in Chapter 8, special members of other households, possibly prominent lineage heads, may have been interred beneath PC Structure 1d rather than within their own residences. The data also show that many individuals were interred in nonresidential contexts, e.g., the T-25 patio area.

Workshop Areas

Whereas at San José Mogote, Oaxaca, workshop functions can be attributed to many of the residences, and occasionally a great deal of variation exists in manufactured products between houses (Flannery and Winter 1976:38–41; Kent Flannery and Joyce Marcus, personal communication), few workshop activities are apparent at most of Chalcatzingo's house structures. An exception is found with PC Structure 2, a structure associated with the Cantera phase elite residence. Here drill cores and quantities of iron ore (some with ground surfaces) indicate workshop activities.

Although no house structure was located on T-37, the large concentration of obsidian debitage there (Chapter 19) indicates a workshop somewhere in that area. A minor dichotomy exists in the chipped stone tool assemblages among certain houses (Chapter 18), but the implications of that dichotomy, particularly in terms of any possible "workshop" functions, are unclear. Other possible workshop areas, far more tenuous, are mentioned below. However, the general

lack of workshop activities at the site may well indicate that unlike the situation at San José Mogote, such activities were not important to Chalcatzingo's overall role and maintenance.

Based strictly upon the quantity and variety of figurines recovered on T-24, Mark Harlan (1979:488) hypothesized that a figurine workshop was there. However, excavations did not uncover supporting evidence in the way of kilns, wastage, etc. In the same manner, certain data have suggested to us that S-39 might have had ceramic workshop functions, yet kilns and wastage are also lacking there and elsewhere on the site. If anywhere on the site kilns were separate from structures, they would probably have been missed by our excavation sampling techniques but should have been recognizable, if near the plow zone, by surface indications (some Classic period lime kilns were discovered in this way). If kilns were constructed on the interterrace slope areas, they remain undetected. Due to the role of Chalcatzingo as a regional center and its interaction with other areas (Chapter 28), it is possible that the pottery used at the site was manufactured at another village in the valley. If this was the case, the village would probably have been north of Chalcatzingo, since minor decorative variations set the Peralta Orange ceramics of the southern valley subsphere apart from those of Chalcatzingo.

Rituals of Termination

The fill of every excavated house structure yielded fragments of greenstone artifacts, primarily thin jade earspools, even though jade was absent from all house burials except those of PC Structure 1. These jade fragments could be interpreted as "workshop debris," yet other evidence of jade working was generally lacking, and social strictures prohibiting jade workers from being jade wearers (at death) would have to be hypothesized. Recent data from the Late Formative period site of Cerros in Belize provide another and more probable explanation. At Cerros, David Freidel (personal communication) and James Garber (1983; personal communication) have identified ritual activities associated with the termination of the use of major structures. These rituals included the breakage and scattering of ceramics and jade.

It was pointed out in Chapter 6 that Chalcatzingo's house structures had been periodically destroyed. The reasons for

the destruction may have been pragmatic, such as the residence's age and deterioration, or ideological, such as the death of the dwelling's main personage. It is quite possible that rituals accompanied the destruction and that these included the breakage of ceramics and jade, just as rituals of termination resulted in similar artifact breakage at Cerros. Thin ear spoils would be the most easily broken items of Chalcatzingo's jade assemblage. The house structures were subsequently rebuilt, and debris from the termination ritual would have become incorporated into the fill. It is normally assumed that potsherds found in house excavations are the result of normal breakage related to household activities. In light of the possibility of termination rituals involving both jade and ceramics, this notion must be re-examined.

The destruction of specific monuments at Chalcatzingo and in the Olmec heartland can likewise be attributed to termination rituals, in these instances coincident with the death of the personage portrayed (Grove 1981b). In Chapter 10 Jorge Angulo offers the possibility that figurine decapitation may be the equivalent of monument mutilation but on a non-elite level. The Chalcatzingo figurine sample, like that from many Mesoamerican assemblages, consists primarily of detached heads and bodies. Very few whole figurines were recovered. The common and purposeful mutilation of figurines by breaking off their heads seems to indicate that some important ritual function was served by this breakage.

Figurines

The typology of figurines presented in Chapter 14 follows that of George C. Vaillant very closely. This approach presented problems in the analysis (Chapter 14) because variability exists within Vaillant's types, and some attributes crosscut types (see Vaillant 1930; 1935). These shortcomings, together with regional variation, have made typological consistency between the Chalcatzingo figurines and those of the Valley of Mexico difficult to attain. Nevertheless, Chalcatzingo's figurines, more than any other artifact category, compare closely with those of the Valley of Mexico, and a large number are identical. On the other hand, Harlan's classification (Chapter 14) is important in that it recognizes that an equally large number of figurines, while

similar in all other attributes, exhibit a distinctive eye treatment. This eye treatment distinguishes them not only from Middle Formative period Valley of Mexico figurines but from those of central and western Morelos as well. While the eye treatment seems to be restricted to the Rio Amatzinac Valley, our sample does not indicate any major intra-valley differentiation.

"Baby-face" figurines are Early Formative. Only a few were recovered by our excavations (Fig. 14.4), since our work in Amate phase levels was minimal. Almost all Early and Middle Formative period figurines recovered were solid, but a few hollow examples occur (Fig. 14.8a). Among these latter was the top of the head of a white-slipped hollow (and presumably "baby-face") figurine found adjacent to a foundation wall of PC Structure 1a. Some Middle Formative figurine bodies depict enlarged stomachs, suggesting pregnancy (Appendix E). Many of these show slits in the sternum—upper belly area.

Because the figurine sample is so large, the quantity of unusual figurines recovered is also larger than "normal." A few of these show facial and hair treatments similar to those of Xochipala figurines from Guerrero (Gay 1972b). This suggests interaction with that region and implies that many of the elaborate Xochipala figurines may be Middle Formative in date. However, it should not be assumed that all unusual figurines result from interaction with as yet undetermined areas. Many could be local innovations. Thin-section analysis of the figurine clays, as was done for the site's major ceramic types (Chapter 13), will assist in the recognition of non-local figurines.

A figurine type which can be considered local to the Río Amatzinac Valley is the type defined by Vaillant (1930:112) as C8. While C8 figurines have been found in the Valley of Mexico and in western Puebla in minor quantities, at Chalcatzingo they constitute 41 percent of the Middle Formative figurine heads, and they seem to be similarly important throughout the valley. While most central Mexican Middle Formative figurine heads show generalized, stylized facial features, the facial features of C8 figurines are far more specific and realistic. Variation in facial features is so specific that subtypes can be classified, which correlate in turn with specific headdress forms.

The C8 facial-headdress subtypes are so individualistic that these figurines must be interpreted as portrait figurines. By analogy to portrait monumental art (Grove 1981b), they depict in all probability individual chiefs, rulers, or important lineage heads. In Olmec portrait monuments the headdress seems to have served as the identifier. The correlation of C8 figurine facial types with headdress forms indicates that a similar identification device may have been in use with these figurines.

At least twenty different individuals, represented in multiple occurrences, have been distinguished in single pieces. Several individuals are illustrated in Figure 27.1, and these can be compared with the more generalized figurine types illustrated in Chapter 14. Although in almost all cases the headdress form correlates perfectly with the facial type, one facial type does seem associated with three headdress forms (Fig. 27.1g–n).

Since both portrait monuments and portrait figurines are found at Chalcatzingo, correspondences in individuals between the two should be expected. One definite match does occur, and another match is possible. One problem in attempting to match monuments with figurines obviously lies in the fact that many portrait monuments are decapitated and the head sections are missing or effaced. Monument 10, a bas-relief showing a frontal human face with a peaked headdress (Fig. 9.27), is duplicated in C8 (Person D) figurines found at both Chalcatzingo and Telixtác (compare Figs. 22.7a–b and 27.1j–l). A more tenuous association, based primarily upon headdress form, is between Monument 17, a carved statue head found with Burial 3, and the C8 subtype designated Person A (Fig. 27.1a–c). Only one burial, no. 29, was in a possible association with a complete C8 figurine (Person O; Fig. 27.2). While the association of Monument 17 with Burial 3 suggests that the monument represented the buried individual, such a conclusion for Burial 29 and C8 Person O is premature.

Since Chalcatzingo's portrait monuments and their mutilation are strong reflections of Gulf Coast culture, the C8 portrait figurines and their certain correspondences with individuals shown on monuments suggest by analogy that portrait figurines may have Gulf Coast counterparts and antecedents. While the Gulf Coast Middle Formative figurine sample is poorly published, some figu-



Figure 27.1. C8 portrait heads: *a-c*, Person A; *d-f*, Person B; *g-i*, Person C; *j-l*, Person D; *m-n*, Person E; *o-q*, Person F (two variants); *r-s*, Person G; *t-u*, Person H; *v-w*, Person I; *x-y*, Person J; *z-aa*, Person K; *bb*, Person M; *cc*, Person Q.

Figurines shown seem to have portrait characteristics (P. Drucker 1943a:Pl. 44; 1952:Pl. 28; Weiant 1943:Pls. 22, 27), though a larger sample is obviously needed. At the same time, while C8 figurines could have Gulf Coast antecedents, it should be mentioned that in eyebrow treatment they are not exactly like central Mexican and Gulf Coast figurines and are most similar to San Jeronimo figurines from near the Pacific Coast of Guerrero (Brush 1968:Pls. 21–26; Vaillant and Vaillant 1934:Pl. 17).

While Chalcatzingo's figurines seem to be portraiture, as presumably are certain Gulf Coast figurines, C8-like figurines from central and western Morelos are not as well made and appear more stylized and generalized. These are perhaps local attempts at replicating the C8 style without portraying a specific individual. Many punched-eye Type A figurines (e.g., Vaillant 1930:Pl. 21) may be closely related to C8's. The figurine typology of Rosa María Reyna Robles (1971) in fact incorporates C8's within Type A. It is my impression that Type A figurines are more common in the Valley of Mexico and that they are possibly the generalized equivalents of C8's in that region.

At the same time, a few well-made C8 figurines, completely identical to those from Chalcatzingo and its local interaction area, have been found at sites in the Valley of Mexico and western Puebla, usually in surface collections. Vaillant (1930:Pl. 17, second row) illustrates several C8's from Tetelpan in the Distrito Federal, including a Chalcatzingo Person Q. Reyna Robles (1971:Pl. 100) shows a C8 (Person A) from Tetelpan as well as several C8's from Epatlan, a village near Las Bocas and Izúcar de Matamoros, Puebla. Most Epatlan C8's duplicate unnamed examples in the Chalcatzingo sample. As noted elsewhere, many of Chalcatzingo's ceramic ties through time are with the Izúcar de Matamoros valley. Further archaeological work will obviously be necessary to understand the distribution of C8 figurines and the implications of C8 figurines (representing "Chalcatzingo personages") found at other central Mexican sites.

The Cult of the Ruler

The functions of the generalized, stylized figurines, which certainly comprise the overwhelming majority in Mesoamerica, have yet to be satisfactorily explained. However, Thomas A. Lee's (1969:62–65) summary is one of the

best available. C8 figurines, because they are portraiture, require a different explanation. As Susan Gillespie suggests in Chapter 15, these figurines cannot be viewed independently from the portrait monuments, for together they serve to identify what can be termed a Cult of the Ruler (see also Grove and Gillespie 1984). This cult apparently was present in Early Formative Gulf Coast sites and continued during the Middle Formative, when it expanded outward to Chalcatzingo and several other sites. Originally apparently expressed only in stone monuments, by the Middle Formative rulers' portraiture was also exhibited on jade artifacts and in ceramic figurines. The cult placed a special importance upon the person of the ruler, presumably both in life and in death. The cult at Chalcatzingo seems to demonstrate a special sociopolitical status which seems, at least overtly, very different from current reconstructions of the social complexity at other Middle Formative period sites in central Mexico.

Many monuments symbolically demonstrated a ruler's links to the supernatural and confirmed his "right to rule" (Grove 1973; 1981b). The ruler was cognized as imbued with supernatural power. The concept of "deities" probably did not exist during the Middle Formative, and it would thus be incorrect to ascribe "divine" status to these rulers, but they were certainly supra-mortal. The Cult of the Ruler expresses and communicates through various media this special position.

The Cult of the Ruler appears to have also embodied aspects of an ancestor cult. Genealogical links were communicated in the iconography and placement of some Gulf Coast monuments (Grove 1981b:67). The communication of lineage ties ("I am ruler because my ancestor was so-and-so") may be an important theme in Olmec iconography as part of the Cult of the Ruler. It is probably present but as yet unidentified at Chalcatzingo (see below). These ancestral aspects of the cult are perhaps exhibited in two monuments, Monuments 1 and 10. Monument 10, depicting a puff-eyed face topped by a pointed cap, sits atop the Cerro Chalcatzingo and not on the residential terraces where portrait monuments normally occur. Its iconography does not communicate the right to rulership or imply the embodiment of supernatural power. Carlo Gay (1972a:66) has interpreted the carving as a "rain deity,"

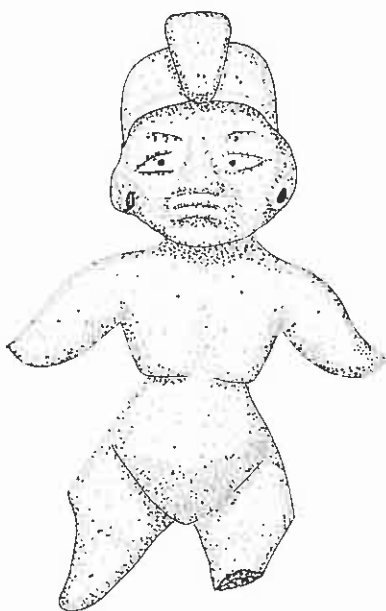


Figure 27.2. Whole C8 figurine, Person O, found in possible association with Burial 29.

but, as previously noted, the old man represented is duplicated in C8 figurines found both at Chalcatzingo and Telixtac. It is probable that this individual had been an important person in life. In ancestor cults the revered ancestors are often associated in one way or another with aspects of rain and fertility (Klein 1980:174; Marcus 1978a); thus a portrait depiction in a context suggestive of rain (see Chapter 10 concerning rain aspects of the sacred mountain) need not be surprising. In this same vein, the personage of "El Rey" (Mon. 1, discussed below) may also represent an ancestor strongly associated with rain and fertility.

Perhaps the strongest similarities to the Formative period Cult of the Ruler occur in the monuments of the Classic period Maya. Here again the depiction of the rulers, with glyphic texts related to significant aspects of their lives, was all-important (see also Pasztory 1978:130). It is probable that the roots of the Maya cult lie ultimately in Gulf Coast antecedents.

MONUMENTAL ART

In studying Chalcatzingo it is very easy to overemphasize the site's numerous monuments to the detriment of the many mundane activities which were the more important aspects of life at the site. Yet the monuments are there, and to understand them aids in understanding something of the cognitive system of the population that inhabited the site. Angulo's analysis of the monumental art in Chapter 10 followed what can be termed a "direct historical approach" utilizing ethnohistorical documents and codices and assuming continuity through time. This differs from my approach to the analysis of Olmec art (e.g., Grove 1981b), which is to recognize Gulf Coast Olmec as clearly a tropical forest culture with a basic belief system which was shared with tropical forest societies in South and Central America. This approach also accepts continuity through time in belief and symbols. While the prehispanic Maya belief system can likewise be considered as tropical forest and serves as a valuable source of information, the belief system of highland central Mexico is quite distinct and less useful as a source of data (even though in some aspects continuities with Olmec art probably exist).

It is difficult to compare Postclassic iconography, related to very complicated religious and sociopolitical systems, with

the data from much less complex Formative period societies. The religion of Postclassic societies in highland central Mexico involved an elaborate pantheon of deities, while Formative period religions apparently involved not deities but supernaturals. Among the Gulf Coast Olmec and at Chalcatzingo these supernaturals were usually represented in zoomorphic or anthrozoomorphic forms. Joyce Marcus (1978a) has suggested that Maya religion too was based upon supernaturals rather than deities. With this different perspective in mind, much of the remaining portion of this chapter involves a variety of observations, comments, and some alternative interpretations of the monuments.

Archaeological dating of Chalcatzingo's monuments through associated artifacts or radiocarbon samples is nearly impossible. The hillside reliefs, Groups I-A and I-B, are situated in areas of extensive and repeated erosion and redeposition. Similar problems occur with almost every other monument; thus, most can be placed chronologically only on stylistic grounds. The monuments share their greatest similarities with La Venta's Middle Formative period carvings, particularly those of phase IV, equivalent in time to Chalcatzingo's Cantera phase. Included in the similarities are bearded figures, circular ornaments in front of the upper lips of personages ("nose dots"), and figures seated with arms parallel and extended forward toward their knees. Further similarities are mentioned in individual discussions below.

Area I-A Monuments

The long-known and often-studied Area I-A reliefs high above the site on the Cerro Chalcatzingo are presented in Chapter 10 as forming a sequence which begins with the easternmost carvings (Mon. 11) and culminates in the large "El Rey" relief (Mon. 1). In that interpretation the clouds move toward the Lord of the Mountain in Monument 1. However, the motion in the sequence could also be seen as in the opposite direction. Monument 1 depicts large scrolls, possibly wind or mist, issuing from the mouth of the cave in which "El Rey" is seated. Perhaps the rain-laden clouds are formed at the sacred mountain of Chalcatzingo and dispersed by the wind (from the cave). The small zoomorphic figures appear to be blowing the clouds away toward the east. There the clouds are thinner and the raindrops fewer as their load becomes

dissipated. This alternative is more in line with the Postclassic concept of rain being "brewed" in caves from which it was dispensed over the countryside. The alternative, however, does not explain the presence of squash plants on the three carvings nearest to "El Rey" unless they simply symbolize the fertility of the area closest to the sacred mountain.

While probably meant to be viewed as a sequence or unified whole, the Group I-A reliefs exhibit individual variability (shown in Table 27.1). Of the six carvings, only five have clouds (interestingly, Monument 7, which lacks a cloud and raindrops, sits between Monument 1 and the others). Two stylistically different cloud forms are shown. Monuments 11 and 15 have thinner, more elongated and sinuous clouds; the others have the thicker cloud form typical of those hanging above "El Rey." Since this variation occurs *within* the sequence, it seems probable that the change in style reflects two different periods of carving, although not necessarily implying any significant time span between the periods.

There is also variation among the zoomorphic creatures, but they all seem to be small lizard-like saurians, probably highland adaptations of the symbolic concepts embodied in the cayman-saurian of Gulf Coast Olmec art. Such transformations between cayman and lizard are documented by Mary Helms (1977) for Central America and are apparently present here as well. Small lizard-like zoomorphs with flame eyebrows also occur in highland Formative period ceramic vessels (Fig. 27.3) and jade artifacts (Joralemon 1976: Fig. 9d).

Angulo (Chapter 10) likens the bifurcated scrolls emanating from the mouths of most of the zoomorphs to the "breath of life." Such an identification also has close parallels to the Zapotec concept of *pe*, which Marcus (1978a:174) notes is translated variously as "wind," "breath," or "spirit," "the vital force that made all living things move."

These small animals relate to earth, fertility, and rain in their symbolism. Yet, from a practical point of view, they can be associated with rain because they "forecast" the beginning of Chalcatzingo's rainy season. Our field experience at the site has shown that lizards "appear" in late May, a few weeks prior to the rains. They are thus the harbingers of rain. In fact, in some parts of Mesoamerica early rains are called "iguana rains."

"El Rey," the major relief of the Area

Table 27.1. Group I-A Reliefs

	Mon. 1 (I-A-1)	Mons. 6-7 (I-A-2,-3)	Mon. 15 (I-A-4)	Mon. 14 (I-A-5)	Mon. 8 (I-A-6)	Mon. 11 (I-A-7)
Bifurcated scroll from animal's mouth			X	X	X	
Scroll as base for animal or person	X	X	?	X		X
Squash plant		X	X	X		
Thin cloud with out-curving ends			X			X
Thick cloud with downcurving ends	X			X	X	
Number of raindrops	Many	0	2?	5-6	2	3

**Figure 27.3.** Vessel of the lizard-like supernatural, National Museum of Anthropology.

I-A monuments, depicts a personage sitting within the stylized mouth of the earth-monster. The mouth here is shown in profile, while Monuments 9 and 13 offer full-faced views. The form of the mouth in all three depictions is significant, for while symbolizing a cave, the upper half of the cruciform is identical to the hill glyph of Monte Albán, Oaxaca. Since bromeliads are shown growing from the inner corners of each of Chalcatzingo's cruciform earth-monster mouths, just as they grow today on the rock faces of the Cerro Chalcatzingo (Fig. 10.11), the cruciform mouth can be seen symbolically as both cave and mountain.

There seems little doubt that "El Rey" personifies a concept such as Lord of the Mountain. The position of the carving high on the mountainside, the symbolism of the cave-mountain, and the numerous raindrops in the garment and headdress worn by "El Rey" all suggest that this is a supernatural personage. Yet

anthropomorphic supernaturals are not common in Olmec art, and "El Rey" lacks the symbols which usually identify such supernaturals: cleft heads, flame eyebrows, feline-like mouths, etc. Just as headdress motifs serve to identify specific real personages in Olmec art (Grove 1981b), the two quetzal birds at the rear of "El Rey's" headdress could also serve as an identifier, implying that the personage is not a generalized supernatural. Moreover, the real and the supernatural may not be mutually exclusive. "El Rey" may represent a divinized ancestor who, in the Cult of the Ruler (discussed above) has assumed supernatural proportions or who mediates with the supernaturals for the good of the society.

The pair of quetzal birds may not be the only identifying motif of importance in the headdress of "El Rey." Also present are two distinct sets of three !-shaped raindrops. This triple raindrop motif is not unique to "El Rey." It also appears on

the headdress of the personage seated within the altar niche of La Venta Altar 5 (P. Drucker 1952: Fig. 52). In the altar the person holds a supernatural baby, while "El Rey" holds a large rectangular object with an S-shaped scroll, perhaps different manifestations of the same supernatural element. Like the triple raindrop symbol, the paired quetzal motif is also found on a La Venta monument (see the discussion of Monument 12 later in this chapter). Both motifs can be used to infer significant symbolic links between Chalcatzingo and La Venta, and even the possibility that the same personages are being depicted on monuments at both sites.

Area I-B Monuments

The carvings from Area I-B have been discussed at length in Chapter 10 and in various publications, and only a few comments will be added here. While Coe (1965a: 18; 1965b: Fig. 49) has identified the objects held by the two central figures of Monument 2 (Fig. 10.13) as clubs, and Angulo (Chapter 10) interprets the same figures as warriors, Jeremiah Epstein (personal communication) has pointed out to me the similarity between the "clubs" and South American agricultural digging sticks. My subjective impression is that the monument depicts a ritual related to agriculture, although if considered in the context of the iconography of the other four monuments in the area (see below) it is difficult to hypothesize an agricultural theme for the entire group.

All four figures in the scene have "bird-serpent" masks identical in style to the small masked figures which form the "background" of La Venta's Stelae 2 and 3 (in most drawings the La Venta masked figures are misinterpreted and are shown with long noses rather than masks, but photographs and actual examination of the stelae show the figures to be masked; P. Drucker 1952: Figs. 49-50; Heizer 1967: Pls. 1-2). The significant person in the Chalcatzingo carving seems to be the seated individual, not only because he alone is in that position, but also because he wears a horned headdress and his mask has been turned to the back of his head, exposing his face. During our excavations at Chalcatzingo some figurines of a nearly identical personage were recovered (Fig. 27.4). From these it can be inferred that the seated person of Monument 2 was of an importance that transcended the relief alone, since the figu-

rines come from scattered site areas and all are perforated for suspension.

Monument 3 (Figs. 9.10, 10.15), showing a large feline whose tongue touches a tall branching object, has details which were covered by fiberglass resin when molds were made of this relief in the 1950's. The major obscured motif, which Angulo and I have studied both together and independently, may be crucial to understanding the symbolism of the branching motif and the relief as a whole. The resin-encrusted area is located between and below the feline and the branching object. Although I previously described the branching motif as similar to the carbon cactus (Grove 1972a: 155), it is now clear that the base of the "cactus" begins simply as a large U-element which lacks a trunk or stem connecting it to the "ground." The obscured motif may make that link.

The anthropologist Iker Larrauri, visiting the site in 1973, offered an interesting interpretation for the large branching motif. He suggested that the circular elements at the tips of the branches might represent water sources (springs) and the long branches, rivers. Angulo (Chapter 10) also interprets the circles as water sources. If this motif is taken as a very schematic representation of the river barrancas in the valley above Chalcatzingo, the branches approach the actual

pattern. The feline, which in such an interpretation could be the representation or "glyph" of the site, drinks water from the source nearest the site, the spring and stream at the foot of the hill. However, this interpretation rests to a great extent upon the ultimate identification of the motif today obscured by fiberglass resin. Angulo (Chapter 10) sees the motif as a human with right arm raised. If that identification is correct, then the feline is licking the upraised arm and not drinking from a water source.

Monument 4 (Figs. 9.11, 10.16, 10.17) depicts felines and humans, while Monument 5 (Figs. 9.12, 10.18) depicts a cayman-like creature with a human. Although their role here is unclear, the feline and the cayman are major Olmec supernaturals of earth, sky, and water. In these scenes they attack humans who are so identical stylistically that the two carvings can be assumed to be contemporaneous. Because the lower feline in Monument 4 has an unusual headdress motif identical to that worn by person c in nearby Monument 2, all three carvings may be contemporaneous and inter-related. With such a unity among the I-B reliefs, Monument 3 is probably also an integral part of this group. Since Monuments 4 and 5 depict humans with upraised arms in association with zoomorphic supernatural creatures, Angulo's

suggestion in Chapter 10 that Monument 3 includes a human with upraised arm in front of the large feline seems plausible. If Monument 3 is part of this group thematically, then perhaps the symbolic content of these four carvings was also meant to be viewed sequentially, as Angulo suggested for the Area I-A monuments.

Monument 12

The paired quetzal symbol at the rear of "El Rey's" headdress is also found on two other monuments. The first, Chalcatzingo's Monument 12, the so-called "Flying Olmec" carving (Figs. 9.14, 10.19), depicts a pair of quetzal birds flying above a human figure. Unfortunately, the personage's headdress, which may have contained other iconographic information, is largely destroyed. Although the monument depicts a supernatural act, it is not inconceivable that the actor was a specific personage, perhaps identified by a headdress motif (now missing) or by the paired quetzal motif.

The second monument with paired quetzal birds is La Venta's Monument 19, a carving with remarkable stylistic similarities to Chalcatzingo's Monument 12, although the personage of Monument 19 is not "flying" but is seated within the curved body of a supernatural serpent. Above this person's head is a motif which Philip Drucker, Robert Heizer, and Robert Squier (1959: 199) describe as "a horizontal rod with a long tassled end." Actually, each end is tassled, and close inspection shows that the tassles are long-tailed birds, presumably quetzales (Fig. 27.5).

The similarities between Chalcatzingo Monument 12 and La Venta Monument 19 are so strong that I believe the person responsible for carving the Chalcatzingo monument must have been intimately familiar with the La Venta monument as well as with the background figures in La Venta Stelae 2 and 3, for the "Flying Olmec's" pose and dress closely duplicate figures on those latter monuments. There are no antecedents to monument carving in central Mexico prior to Chalcatzingo and thus the similarities of Monument 12 to certain La Venta carvings suggests that the carving was executed by an artisan trained on the Gulf Coast.

La Venta's Monument 19 was found in a good La Venta IV context, suggesting that we are correct in dating Monument 12 to the Cantera phase. The personages in both monuments are depicted with

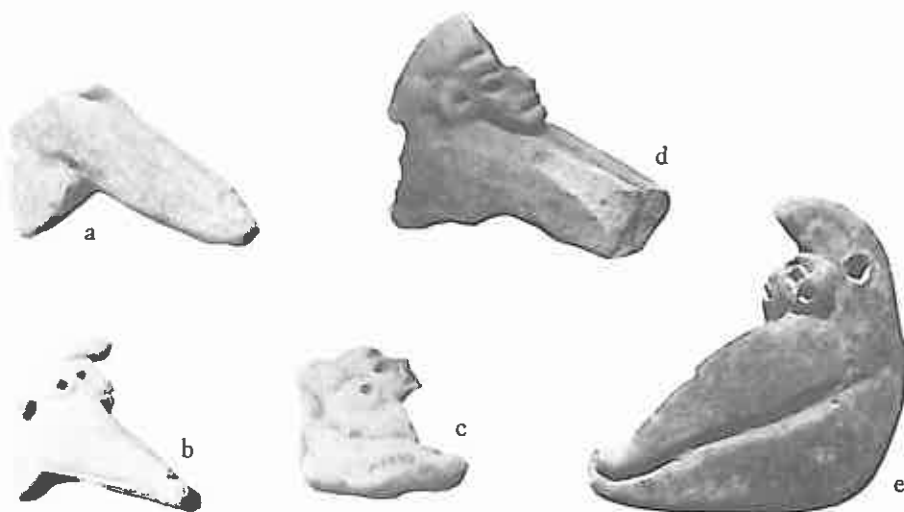


Figure 27.4. Figurines similar to seated figure in Monument 2: a-d, Chalcatzingo excavations; e, private collection, reported to be from Chalcatzingo.

nose dots in front of their upper lips, an attribute also found on Middle Formative period figurines. The La Venta Monument 19 personage holds an object somewhat similar to the handstone (Fig. 20.9) found in the excavations of PC Structure 2. The "Flying Olmec" of Chalcatzingo Monument 12 holds two objects, one a torch, the other indistinguishable. By analogy to jades with a similar flying person theme (Cervantes 1969: Figs. 7, 9, 10), the second object was probably a so-called knuckle duster. Angulo (Chapter 10) identifies the personage as a ball player based upon the objects held and the flying or leaping pose. I believe the theme is not related to the ball game. The parrot beneath the personage indicates that the artist clearly intended to indicate an act of flying rather than leaping after a ball, and the torch held aloft suggests possibly a flight through the underworld, perhaps with the personage as mediator between the upper and lower realms. There is also increasing evidence that the knuckle duster and torch symbols may be somehow related to blood-letting rituals, a topic beyond the scope of this chapter.

Assuming that the long-tailed birds depicted are indeed quetzales, they are clearly birds foreign to the Chalcatzingo area. In later Mesoamerican cultures the quetzal symbolized the east, but whether such symbolism is intended here is a matter for further analysis. The presence of the paired long-tailed bird (paired quetzal) motif on Chalcatzingo's Monuments 1 and 12 and on La Venta Monument 19 indicates at the minimum an important symbolic link between the two centers. If the motif is an identifier for a particular personage, then the presence of that personage in the art at both sites, including on Monument 1 in the possible role of revered ancestor as discussed earlier in this chapter, carries even greater significance. As noted earlier, the personage in Monument 1, "El Rey," also shares the triple raindrop motif with the personage of La Venta Altar 5.

Monuments 21, 26, 27, and 28

Chalcatzingo's Monument 21 (Fig. 9.21, 10.21) is the only certain female depicted in Mesoamerican monumental art of the Early or Middle Formative. The monument can be placed in time because it had been erected in front of a Late Cantera subphase stone-faced platform, T-15 Structure 5. The woman on Monument 21 stands upon an earth monster mask



Figure 27.5. Close-up of La Venta Monument 19 showing paired quetzal birds.

(Fig. 10.21), the earliest datable use of this symbol in Mesoamerica. Only one other possible Middle Formative example is known, Monument 1 at Los Mangos, Catemaco, Veracruz (de la Fuente 1973: 161). The earth monster mask is far more typical of Late Formative Izapan art (e.g., Norman 1976: Fig. 2.7), and is but one of several traits at Chalcatzingo which are more common to Late Formative period southern Mesoamerica (see Chapter 28).

Since monuments functioned to communicate a set of ideas, the fact that the personage shown on Monument 21 is female is highly significant. Ann Cyphers Guillén (1984) has suggested that the stela commemorates a marriage alliance between a Gulf Coast center and Chalcatzingo. In ethnographically recorded alliances related to trade and exchange, the woman is usually sent from the major partner to the lesser partner. In Chapter 10, it was suggested alternatively that the area from which the woman came was glyphically expressed within the scene's basal earth mask and was not the Gulf Coast. Instead, the *tierra caliente* of Guerrero is postulated. That interpretation was based upon a diamond motif. The possibility of a Guerrero alliance being commemorated by this monument has been strengthened since

the writing of Chapter 10 by the discovery of a new site in Guerrero, Teopantecuanitlan (Martínez Donjuan 1982), which contains four Olmec-style monuments set in the walls of a rectangular patio similar to Chalcatzingo's patio on Terrace 25. Each monument depicts a massive baby-face supernatural wearing a headband containing four cleft rectangle motifs (e.g., Mon. 1, the only one of the four yet published; *ibid.*: Fig. 4). From photos taken by archaeologists who have visited the site, it appears that the cleft rectangle motifs on one (and possibly two) of the unpublished monuments are identical in form and interior symbols to the unusual cleft rectangles found on the pillar-like object on Chalcatzingo's Monument 21. The presence of an unusual motif on monumental art at both sites indicates to me that they were in significant contact and suggests that the motif could have functioned as a "place glyph" for one of the sites which was incorporated onto a monument at the other site to attest to their ties.

The undulating motif with elongated oblongs, which covers most of the vertical pillar and appears beneath the pillar as the background of the earth-monster mask, is also found on Monument 27 (Figs. 9.25, 10.22), where it decorates the body of the animal being carried (or ani-

mal cape being worn) by the personage shown on that stela. It also appears on the ledge of Monument 22, Chalcatzingo's table-top altar (Fig. 27.6). This latter context offers possible clues to the symbolism of the motif, for on Gulf Coast altars the iconography of the upper ledge appears to symbolize the earth. The elongated, rectangularly shaped, inverted-U elements which represent the upper tooth row of the cayman or saurian supernatural decorate the ledges of La Venta Altar 4 and Potrero Nuevo Monument 2. This motif is identical to the upper tooth row on ceramic depictions of the saurian supernatural (e.g., Joralemon 1976: Fig. 7) and in symbolism seems to carry over to the basic Middle Formative double-line-break motif decorating vessel rims (Donald W. Lathrap, personal communication). Rarely, the altar ledge may depict a sky cayman supernatural or have jaguar associations (Grove 1970a: frontispiece; 1973), but earth symbolism appears most common. Thus the undulating line motif at Chalcatzingo may symbolize some aspect of the earth. The elongated oblongs within the undulating lines are reminiscent of later symbolism of flowing water, and thus could relate not only to earth but to earthly water as well.

The personages shown on Monuments 21 and 27 are probably specific individuals (e.g., Grove 1981b). Both of these monuments were associated with stone-faced platforms related to the individuals portrayed. The presence of the undulating design on both stelae suggests that they are closely contemporaneous and perhaps even implies a relationship between the persons portrayed (e.g., the Monument 21 woman as wife or mother of the Monument 27 person; their carving techniques are different, suggesting that they were not executed at the same time). If the motif indicates a relationship between the stelae, their relationship to the table-top altar which also has this motif is confused by the altar's possible anachronism (see above).

Chalcatzingo's largest known stela, Monument 28 (Figs. 10.23, 10.24), was found buried at the western edge of T-6, a terrace also containing Monument 27 in situ in front of a stone-faced platform. In Chapter 6 it was suggested that terraces were "owned" and passed on through family or lineage. Rulership may also have been passed on through a certain lineage. The presence of two portrait or rulership monuments on T-6, one buried

and one standing in situ, suggests that the Monument 28 personage not only preceded the Monument 27 personage in time but was his ancestor as well. Monument 28 could in fact have once stood in front of one of the earlier building stages of T-6's stone-faced platform mound (T-6 Str. 1).

As noted in Chapter 9, the personage on Monument 28 is adorned with plume-like ornamentation. Curiously, the plume-like motif is the inverse, on a smaller scale, of the large branching motif found in front of the feline on Monument 3 (Fig. 9.10). Just as Monument 28 is earlier than Monument 27, Monument 3 may be the earliest of the Area I-B reliefs (Monument 4 was erected onto the boulder of Monument 3 and is stylistically more similar to Monuments 2 and 5 than it is to 3).

It is probable that the upper, missing, portion of Monument 26 (Fig. 9.24) was also a portrait carving of an important individual, and thus T-6 can claim three such monuments. It is noteworthy that in its form and execution Monument 26 is crude and ovoid in cross-section and therefore very similar to Monument 28 but very different from the well-executed and nearly rectangular (in cross-section) Monument 27. If these features have chronological significance, then some degree of contemporaneity can be hypothesized for Monuments 26 and 28.

Monuments 9 and 24

The broken remains of Monument 9 (Fig. 9.17) were found by looters on the upper area of the Plaza Central's long platform mound (PC Str. 4). Two motifs on this large earth-monster face deserve further mention: the long, undulating eyebrows, which terminate in bifurcated elements, and a cartouche which occurs between the eyebrows. The undulating "cleft-eyebrow" motif is not unique to this monument nor to Chalcatzingo. It occurs on other examples of Olmec-related art, including Chalchuapa Monument 5 (D. Anderson 1978: 171), and more commonly on engraved jades (see for example Joralemon 1976: Figs. 12e, 14a, 17f). The presence of the motif at both Chalcatzingo and Chalchuapa, sites with Olmec-style carvings, is of particular interest.

The cartouche contains a "face" composed of two oval "eyes," below which are two short vertical "fangs." Two similar cartouches occur on Monument 24, but if the positioning of this latter monu-

ment proposed in Chapter 10 is correct (see Fig. 10.25), the cartouches are upside down. The similarity of the inverted cartouches to the raindrop motif has led to the ambiguity in the correct positioning of the stela as erected on the site today, based upon the orientation of the cartouche in Monument 9 and the large uncarved tapering section of the stela, which can only be its basal section.

Monument 24 is incomplete, since its upper section has been broken off (see Fig. 9.22). Natural exfoliation of the rock has likewise damaged much of the remaining carved area, and only a few fragments of the original design exist below the paired cartouches (Fig. 27.7). The most visible motif below the right cartouche appears to be the flaked remnant of a flame eyebrow, beneath which is a section of an elongated eye. The eye section can be seen on the left side of the carving as well. A few diagonal elements occur lower on the carving which with imagination resemble the "tears" beneath the eyes of the face of the supernatural depicted on Tres Zapotes Stela C. The extant carving may have been an earth-monster mask such as forms the base motif on Monument 21 (one vertical bar on the carving may be part of an upcurved fang). The stela's main design was obviously on the missing section. Of interest is the association, on two monuments, of the cartouche ("face") with the earth-monster face.

Monument 18

Although most Chalcatzingo monuments were erected vertically, Monument 18 (Fig. 9.20) may have been meant to lie horizontally, for its small carving is adjacent to a "water ritual hole" (Chapter 11). In Chapter 10 Angulo states that a vaguely carved face visible only at certain times of the year occurs within the concentric oblongs of this relief. My recent reinspections of this monument and of Monument 4, in which he feels that a face is carved in the cleft "ear" element on the head of the lower jaguar, indicate that no such faces exist. Natural irregularities and grains in the rock may have caused misleading features to appear in the rubbings of these monuments.

THE SACRED MOUNTAIN

With its bas-relief carvings, Chalcatzingo is unique among Middle Formative sites in highland central Mexico. Its

monumental public architecture adds to its uniqueness. Its location in the Rio Amatzinac Valley rather than elsewhere raises several questions. Other highland valleys were far more fertile but were not chosen. Other cliffs were suitable for bas-relief carvings but remained uncarved. Numerous locations have far easier access to much more abundant water. Therefore, there was obviously something about this location that transcended its selection beyond simply materialistic criteria. That special something was apparently the cognition of the twin hills of Chalcatzingo as a sacred mountain (Chapter 10). While other mountains could and did have sacred connotations, the cleft or "split-hill" form of these mountains made the sacred character of the location symbolically apparent (Cook de Leonard 1967: 63–66). The cleft in the mountain was the entrance to the underworld, the source area of supernatural power, making this a most sacred of sacred mountains. This presents a chicken-and-egg type paradox, for it is uncertain whether the original Early Formative period settlers of Chalcatzingo located here at least partially because they perceived this symbolism, or if the symbolism played a role only in the site's later development.

The placement of the monuments at the site is directly related to the symbolism of the locale. The Area I-A reliefs occur high on this hillside, along the natural watercourse which carries rain-water runoff from the western hillslopes. That these particular carvings symbolize rain, water, and fertility is not surprising. But in the largest relief of this group, Monument 1, the personage is depicted as seated within a cave. This, of course, may have a generalized "heart of the mountain" meaning rather than symbolizing an actual cave, yet a cave may have existed here. In the letter to the Mexican government reporting the discovery of "El Rey" (Chapter 1), the villagers who cleaned the carving state that they heard the noise of an "interior rock-fall" which suggested to them that a "temple or tomb" lay buried beneath the jumble of boulders to the left of the carving. This possibility was not investigated by our project due to the risk such work would impose for Monument 1.

While the Area I-B reliefs occur just below the cleft in the sacred mountain, a more important criterion seems to be their location at the base of a massive



Figure 27.6. Eastern ledge of altar, Monument 22, showing undulating motif with elongated oblong.

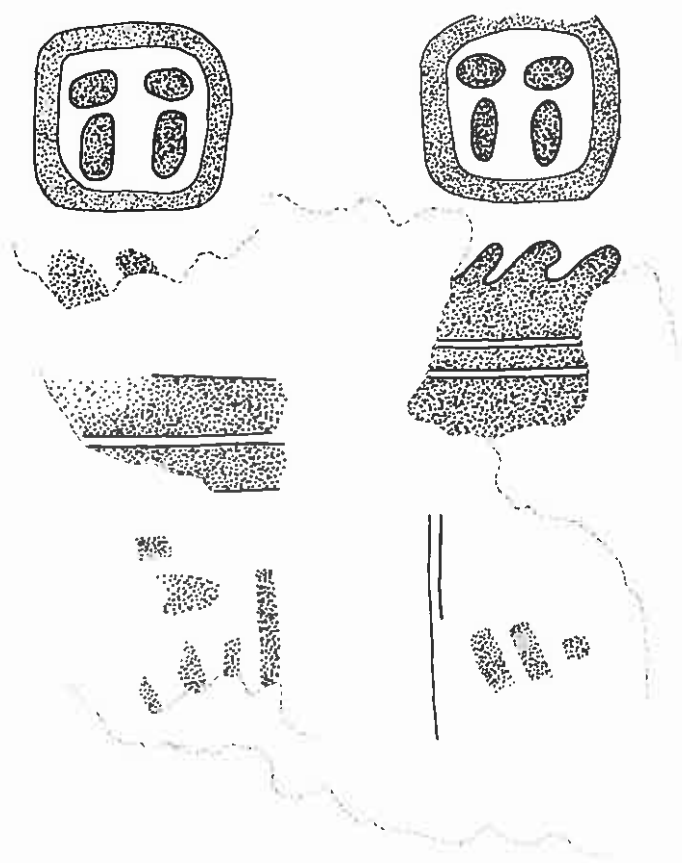


Figure 27.7. Details of Monument 24, as interpreted by Grove. Dashed lines indicate exfoliation.

fracture in the Cerro Chalcatzingo itself (Fig. 27.8), a wide secondary cleft into the sacred mountain. Groups I-B and I-A both deal with mythico-religious rather than rulership themes. Their positioning on the sacred mountain itself is clearly related to their thematic content.

The terraces at the base of the sacred mountain served as "public" and residential areas, the former expanding through time. Monuments associated with these terraces related largely to the commemoration of specific individuals and the Cult of the Ruler. It is these monuments which are mutilated. Those on the hillside, dealing with ritual or supernatural themes, sit unmolested. Although we do not have good chronological data on most of the site's monuments, the differences between the hillside carvings and those of the terraces seem to be functional/thematic and not strictly chronological.

Although the painted art at Chalcatzingo may date to the Classic period (using the Cave 19 art as a reference; Chapter 12), it is interesting that a distinct dichotomy exists between the location of the painted and the carved art. The mythico-religious carvings occur only on the Cerro Chalcatzingo, and with only one exception the red paintings on the *cerros* occur on the Cerro Delgado and in the "saddle area" (the cleft between the *cerros*). Implicit underworld symbolism is present even in the painted art, for almost all occur in caves or niches, and within these locales many paintings are associated with concavities in the rock.

As Angulo noted in Chapter 10, the sacred character of the *cerros* continues today, although in a Christian guise. Crosses have been erected atop both hills, and both public and private rain-related ceremonies are carried out. Whether the regional cultures of the Postclassic, Classic, and Late Formative attached as great an importance to this sacred mountain is a matter of conjecture, but earlier inhabitants clearly recognized the sacred nature of their locale. They dwelt at the entrance to the underworld and by implication had greater access than others to the supernatural powers therein; this would have made them more "powerful" in the eyes of others as well.

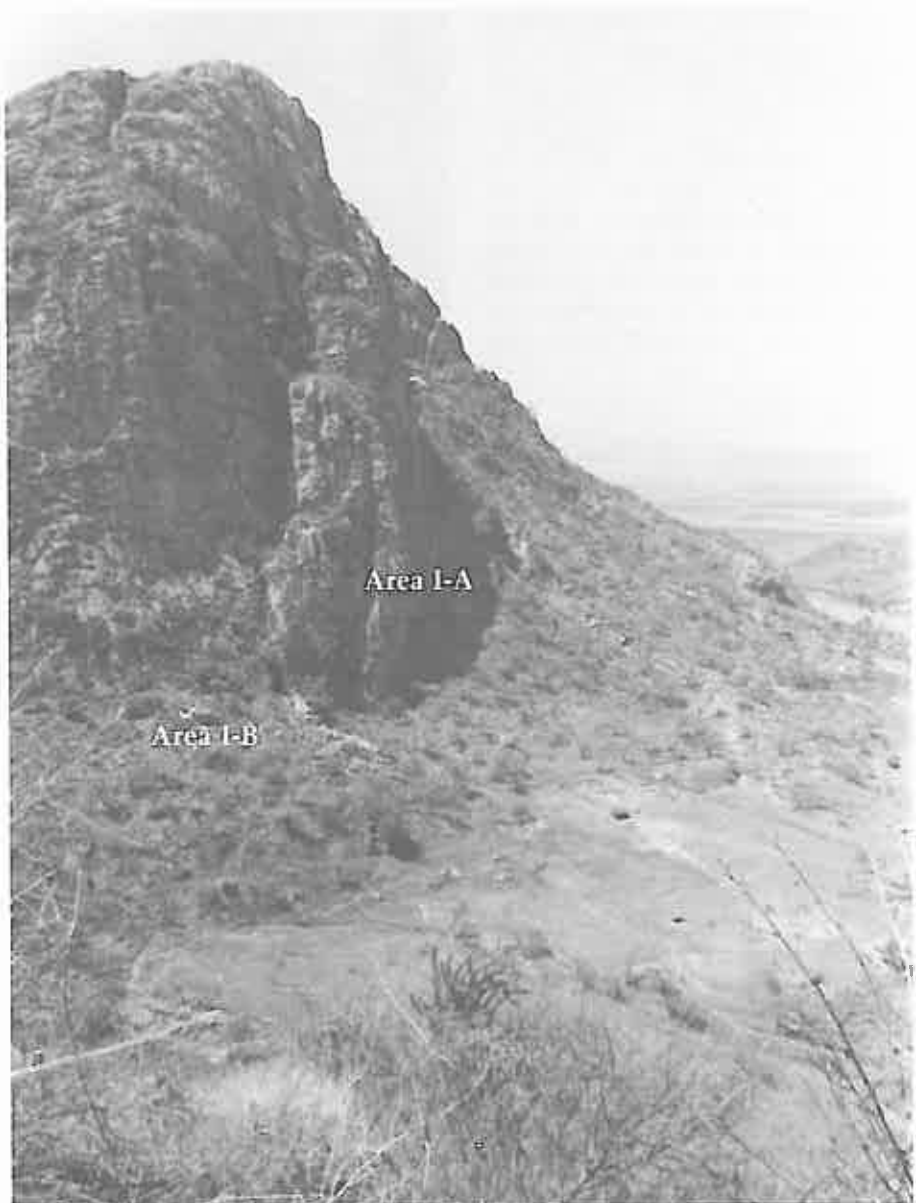


Figure 27.8. Northeast side of Cerro Chalcatzingo showing massive fissure above the Group I-B monument area.

RESUMEN DEL CAPÍTULO 27

Algunos de los principales datos referentes al sitio y a su organización están resumidos y comentados en este capítulo.

Chalcatzingo está ubicado en la zona más favorable del Valle del Río Amatzinac. Cuenta con el agua de un manantial, con buenas tierras agrícolas, así como con varias zonas ecológicas accesibles para la recolección. En la fase Amate, Chalcatzingo era el mayor asentamiento del Valle, pero no había alcanzado aún el tamaño de las aldeas situadas en el valle del Río Cuautla, que era agricolamente más rico. Durante la fase Barranca Temprana, fueron construidas las terrazas. El patrón residencial, durante el período Formativo, parece haber sido "disperso," contándose sólo una habitación principal por terraza. Es difícil comparar este patrón "disperso" con aquellos asentamientos del Valle de México que han sido considerados "dispersos," ya que estos últimos están basados únicamente en datos obtenidos a partir de reconocimientos de superficie. Si las terrazas también eran utilizadas para la agricultura, una hectárea de tierra pudo haber mantenido a una familia de cinco personas. La cantidad limitada de terrazas en Chalcatzingo hace suponer que otras porciones de tierra cercanas también eran cultivadas. Es probable que aprovisionamientos adicionales de alimentos hayan podido ser adquiridos por medio de intercambios o de tributo, inclusive perros, cuyos restos abundan en los basureros de Chalcatzingo.

Todo el Valle del Río Amatzinac estaba estrechamente aliado con Chalcatzingo y fuertemente influenciado por él. Algunos tipos cerámicos, como son el *Peralta Naranja*, las figurillas Ch1 y C8, así como la arquitectura pública, son escasos fuera del Valle. Existen cuatro sitios más de la fase Cantera en el Valle, que tienen arquitectura pública. Probablemente hayan sido centros secundarios.

Sólo algunas casas dan muestras de actividades artesanales claras. Esto parece indicar que probablemente los talleres no eran importantes para el papel que el sitio jugaba.

Mientras que una sola casa (P.C. estructura 1) tenía entierros asociados con jade, el material encontrado debajo de los pisos de casi todas las casas incluía pequeños fragmentos de jade. No se trata de material de manufactura, sino de

pedras de jade intencionalmente rotas y depositadas durante los rituales realizados al ser destruida la casa (antes de su reconstrucción).

Las figurillas del sitio son similares a los tipos del Valle de México, originalmente descritos por Vaillant. Existe, sin embargo, una importante excepción: las figurillas C8, que representan el 41 por ciento de la muestra de Chalcatzingo, son escasas o inexistentes en cualquier otra parte del Centro de México. Estas figurillas son retratos, probablemente de dirigentes locales y de jefes de linaje. Pueden ser distinguidos más de veinte individuos diferentes. Uno de los personajes es igual al que se encuentra representado en el Monumento 10.

Los retratos, en figurillas y en monumentos, permiten pensar en un Culto al Dirigente. Este culto, que también está presente en la Costa del Golfo, era, en cierta medida, un culto a los ancestros. También está asociado a la religión, ya que el ancestro empezó a ser venerado y asociado a la lluvia y a la fertilidad.

La cultura Olmeca de la Costa del Golfo tiene fuertes semejanzas con las culturas de los bosques tropicales de Centro y Sud América. El arte Olmeca puede, entonces, ser mejor analizado a través de analogías etnográficas con esa región. Varios relieves han sido estudiados en esta forma, y su localización permite suponer que los cerros en Chalcatzingo tenían un carácter sagrado.

28. Chalcatzingo in a Broader Perspective

DAVID C. GROVE

Although various chapters in this book have occasionally commented upon Chalcatzingo's interactions with other areas of Mesoamerica, the major emphasis has been on the site itself. It would be difficult, however, to discuss Chalcatzingo without considering contemporaneous developments in Central Mexico, the Gulf Coast, and Mesoamerica in general. Thus, this chapter begins with summary discussions, placing Chalcatzingo within larger frameworks. It concludes by reviewing various hypotheses which have been previously offered for the development of Chalcatzingo and with a presentation of my own personal observations and hypotheses. Admittedly there are occasional conflicts or contradictions in the reconstruction, at least some of which I must attribute to the nature of the data and the unfortunate lack of comparative archaeological data elsewhere.

INTERACTIONS WITH OTHER AREAS

Chalcatzingo and the Central Highlands

Early Formative settlements in Morelos and the Valley of Mexico consisted primarily of hamlets and small villages. No large centers have been defined for this early period. Throughout the region the ceramic assemblage is characterized by Red-on-Brown "exotic bottles," and D2, K, and red-slipped hollow D-K figurines. A minor component (less than 10 percent) of the assemblage consists of vessels with so-called Olmec iconographic motifs ("jaguar-paw-hand" and "fire serpent") and baby-face C9 figurines. This minor component occurs on all settlement levels from solitary rural residences to villages, here as well as elsewhere in Mesoamerica. It does not seem to be indicative necessarily of Gulf Coast contacts or influences [Flannery and Marcus 1976b; Grove 1974a].

While regional variation exists within this Morelos-Valley of Mexico ceramic assemblage, the far stronger similarities allow the identification of a "Tlatilco culture" interaction sphere encompassing this area. Economic interaction between villages within this sphere can be inferred not only from certain of the exotic ceramics (which may have been manufactured at only a few production villages) but also through obsidian analysis. Characterization of obsidian from sites within the sphere shows it to be mainly from the Otumba (Teotihuacan Valley) and Paredón sources (Charlton, Grove, and Hopke 1978). These sources were apparently controlled by villages within the interaction sphere.

The Amate phase artifact assemblage from Chalcatzingo contains Red-on-Brown "exotic bottle" sherds (Cuahtla Red-Slipped, Chapter 13), D2 and C9 figurines (Chapter 14), and Paredón and Otumba obsidian (Chapter 23), indicating that the site was within the "Tlatilco culture" interaction sphere. At the same time, Del Prado Pink sherds, identical to those in surface collections from the site of Las Bocas in the Izúcar de Matamoros Valley to the east, indicate some form of interaction with that area as well. The ceramics from Las Bocas, apparently typical of Early Formative ceramics from the Izúcar de Matamoros Valley in general, have been incorrectly associated in the literature with the Tlatilco culture assemblage (e.g., Coe 1965a). Although some similarities exist, enough major differences are present to indicate that Las Bocas ceramics are part of a different interaction sphere. Chalcatzingo is apparently situated at the eastern extent of the Tlatilco culture interaction sphere and on the western border of the Izúcar (Las Bocas) sphere.

In contrast to the cultural cohesiveness in Morelos and the Valley of Mexico area during the Early Formative, when

we can speak of a Tlatilco culture interaction sphere (demonstrated in ceramics and obsidian), greater intra-regional variation occurs during the Middle Formative period. Shared ceramic attributes within the region include white-slipped vessels decorated with the double-line-break motif and some basic figurine types, such as C1-C7. In fact, it is primarily in the figurines that Morelos-Valley of Mexico similarities are most apparent.

The Middle Formative period is not well documented in the archaeology of central Mexico. Comparative published materials come primarily from El Arbolillo and Zacatenco (Vaillant 1930; 1935) and Atlamica (McBride 1974), and intra-regional differences are apparent in these collections. The nature of these communities remains virtually unknown, although some inferences can be made with El Arbolillo data. Wall lines and burials uncovered in El Arbolillo Trench C (Vaillant 1935: Fig. 8) seem to represent the remains of a house foundation and the house's subfloor interments. Most of the Trench C graves were slab-covered and/or lined, making them very similar to the crypt graves of Chalcatzingo's PC Structure 1. A pair of jade earspools was discovered with a non-crypt infant burial in Trench C, and George C. Vaillant (1935: 175) notes that the burials from this trench were richer than others recovered. By analogy to Chalcatzingo, the Trench C structure seems to represent the remains of an elite residence. The other burials recovered by Vaillant at the site would thus be the remains of lesser-ranking individuals. The lack of architectural features with or near these other burials suggests that they may not be residential subfloor interments.

Crypt ("cist") elite graves are also known from La Venta (P. Drucker 1952: 67-71). While the use of such burial

embellishment at Chalcatzingo could be taken as evidence of Gulf Coast influence, the presence of crypt graves at El Arbolillo as well suggests that crypt graves for elite individuals may have been a relatively widespread practice.

One problem in understanding the position of Chalcatzingo within the larger scope of central Mexico during the Middle Formative lies with the nature of the site of Cuicuilco at that time. This site, in the southwest Valley of Mexico, was the major Late Formative period center in the Valley of Mexico prior to 100 BC. However, its size and importance during the Middle Formative are uncertain. Robert Heizer and James Bennyhoff (1972) interpret the data from their limited excavations there to indicate that Cuicuilco had been a large Middle Formative ceremonial center with platform mounds and pyramids. But the Cuicuilco excavation data and chronology present numerous problems. Much of the excavated material comes from mixed levels, and while there may have been a Middle Formative community at Cuicuilco, the size and architectural component of that community are still very uncertain.

If Heizer and Bennyhoff are correct, then the presence of such a large center contemporaneous to Chalcatzingo but with more numerous and elaborate architecture would necessitate a reconsideration of Chalcatzingo's role in the highlands. The Chalcatzingo antecedents hypothesized for Cuicuilco by Heizer and Bennyhoff (1972:98) are no longer tenable in terms of new data from both the Valley of Mexico and Morelos. Reconstruction of Chalcatzingo's non-ritual functions later in this chapter is based on the assumption that Cuicuilco was not a large center at the time Chalcatzingo was at its prime. It is possible, however, that Cuicuilco's growth did take place during the Middle Formative period. If so, the ascendancy of that center in the southwestern Valley of Mexico may be partially responsible for Chalcatzingo's decline.

If viewed solely on its ceramic and figurine inventory, with no thought to monumental art and greenstone artifacts, Middle Formative Chalcatzingo has to be classified as culturally central Mexican. As in the Early Formative period, the site's strongest ties outside of the Río Amatzinac Valley were with the Valley of Mexico, but with additional interaction with the Izúcar de Matamoros Valley and western Puebla. The Izúcar de Matamo-

ros interaction is particularly demonstrated by the C8 figurines found in that area, and general ties with western Puebla are suggested by Pavón Fine Grey ceramics. Not only are grey ceramics more common in the Puebla area (as well as Oaxaca, and, as noted in Chapter 13, they are found on the Gulf Coast as well), but thin-section analyses (Chapter 13) show Pavón Fine Grey to have a clay body with aplastics derived from metamorphic rocks. Metamorphic rocks occur in a band across the southern part of the state of Puebla, starting almost at the Río Amatzinac Valley and running eastward. Some occur in the area of the Izúcar de Matamoros Valley.

Chalcatzingo and the Gulf Coast

The similarity of Chalcatzingo's bas-relief carvings to those of the Gulf Coast Olmec has long been recognized. A number of other artifacts recovered by our excavations likewise have Gulf Coast counterparts and are mentioned in various chapters of this book. It is obviously important that these Olmec traits at the site be viewed in a balanced perspective and be neither overemphasized (as is normally the case) nor completely dismissed. These traits are briefly reviewed here, and later in this chapter they will be used in discussing the validity of a number of hypotheses concerning the nature of Chalcatzingo.

As mentioned frequently throughout this book, the Middle Formative period ceramics from Chalcatzingo and the Río Amatzinac Valley include a component which is not found in the rest of the central Mexican highlands and which I have used to define the Río Amatzinac Valley as the local interaction area of Chalcatzingo. Included in this ceramic component are Peralta Orange ceramics, Pavón Fine Grey ceramics, three-pronged braziers, and C8 portrait figurines. Traits found at Chalcatzingo (but whose distribution elsewhere in the valley is uncertain) include the placement of *cantaritos* within small bowls as mortuary furniture for some higher-ranked individuals, and animal whistles depicting opossums, etc., with paws over their muzzles. Each artifact type of this component is virtually absent at other highland sites but can be found on the Gulf Coast (see Chapter 13).

Artifacts other than ceramics can be added to the list of Gulf Coast traits. Chapter 17 discusses a variety of jade artifacts, such as T-shaped and duck-bill

pendants, which replicate pendants from La Venta in form. At the same time, no large celt offerings such as were found at La Venta (P. Drucker, Heizer, and Squier 1959:133–146, 174–189) or even San Isidro, Chiapas (Lowe 1981) were found in our excavations. With few exceptions there is nothing spectacular about the jade recovered. Rumors exist of an "engraved green axe" found by a visiting schoolteacher (who when located and interviewed denied any such find). Frans Feuchtwanger (personal communication) recalls that a jade figure in the collection of the National Museum of Anthropology (Pohorilenko 1972: Fig. 68) was originally provenienced in museum records as from Chalcatzingo, but this remains unverified by us. In Chapter 17, Charlotte Thomson suggests that the dearth of jade at the site may indicate that Chalcatzingo had only minor religious and economic importance to the Gulf Coast. Other data do not bear this out. It is more probable that Gulf Coast control and demand for jade effectively relegated Chalcatzingo to the role of intermediary rather than consumer of this and other exotic materials.

Middle Formative period Gulf Coast centers are notable for their mound architecture, which includes both long platform mounds flanking plazas and, occasionally, pyramid-like structures (e.g., Bove 1978: Map A; Coe and Diehl 1980: Map 2; P. Drucker, Heizer, and Squier 1959: frontispiece, Fig. 4). Mound and plaza arrangements at this time were not unique to the Gulf Coast but occurred in Chiapas as well (Lowe 1977: 224–226). In the central highlands of Mexico, however, long platform mounds are currently known only from Chalcatzingo and the Río Amatzinac Valley. As mentioned earlier, the evidence for public architecture at Cuicuilco is extremely tenuous.

The inspirational source of Chalcatzingo's mound architecture has not yet been determined, and in one sense presents a paradox. PC Structure 4d, the 70 m long Cantera phase platform mound, resembles the long platform mounds in the Olmec heartland. However, this mound is only the final stage of several mound rebuildings, with the earliest mound (Str. 4a) apparently dating to the Amate phase (see Chapters 4 and 6). Evidence of significant interaction between the Gulf Coast and Chalcatzingo (specifically) during the Amate phase is lacking. Whether the Amate phase Structure 4a was an indigenous development or Gulf Coast-

inspired cannot presently be determined.

There is little question that Chalcatzingo's reliefs contain a multitude of stylistic similarities to Gulf Coast monumental art. These similarities are not simply iconographic but also extend to the types of monuments, to the techniques of manufacture, and to the monuments' ultimate disposition (mutilation). At the same time, strong dissimilarities are present in the art, and the same dissimilarities can be found in the monumental art at sites such as Chalchuapa, Xoc, Piedra Parada, Pijijiapan, Oxtotitlan, and San Miguel Amuco. In fact these differences are so standardized that an Olmec "frontier art style" can be distinguished (Kann and Grove 1980). At all of these "frontier" sites, including Chalcatzingo, there are no local antecedents to bas-relief rock art. The concept and techniques were imported fully developed. The similarities and standardized dissimilarities to the Olmec heartland style, together with the inescapable fact that only the Gulf Coast is known to have a monumental art carving tradition, imply that the variant "frontier" art style was specifically taught as a separate style on the Gulf Coast and disseminated outward from there.

Olmec monumental art, whether in the heartland or in its frontier variant, was meant to communicate a set of ideas and messages to those viewing it. The presence of a separate style for sites outside the Gulf Coast, to communicate ideas somewhat different from those presented on Gulf Coast monuments, suggests that the frontier monuments' messages were directed to non-Olmec audiences. It is also highly important to recognize that for those specific sites outside the Olmec heartland there was a felt need to communicate via monumental art.

That this presentation was for peoples not familiar with Gulf Coast iconography and symbolism can be demonstrated with Chalcatzingo's hillside art. Here the symbolism which was only implied in Gulf Coast iconography is overtly and graphically expressed. For instance, the implied symbolism of the shallow niches found on the front of Gulf Coast altars is explicitly detailed in Chalcatzingo Monument 1, where the niche is shown as the mouth of the earth monster, the underworld, the heart of the earth, the source of rain and plant fertility.

Frontier art may have served to legitimize the presence, no matter how small

or infrequent, of Gulf Coast persons at those sites, or it may have been commissioned (with Gulf Coast assistance) by a local ruler to demonstrate his special power through showing that he controlled and understood the complex esoteric knowledge of the supernatural realm, gained via interaction with the Gulf Coast (e.g., Helms 1979:119–129). Whatever the reason, those sites which manifest such art were clearly special, and different from the communities in their respective areas lacking the art.

Chalcatzingo has two different but integrated and contemporaneous artifact assemblages, one central Mexican, the other with ties to Puebla and to the Gulf Coast. These distinctive components must not be used to infer two separate ethnic populations in the Middle Formative community. The artifact components occur together and are not separated between houses, *barrios*, etc. Their nature, however, is different. The Gulf Coast-like component is strongly ritualistic and rulership-oriented. During the Cantera phase this can be seen in the monuments, jade figurines, C8 figurines, and mound architecture. The central Mexican component includes more utilitarian pottery types and generalized figurines. From this it can be inferred that Chalcatzingo's Gulf Coast ties were through the ruler (directly or by marriage), and that via these ties a number of traits from the Gulf Coast inventory were introduced to the site. At Chalcatzingo these traits blended with the local assemblage and ultimately diffused throughout the Río Amatzinac Valley. Their presence at Chalcatzingo and their ultimate local diffusion occurred over a long period of time and does not imply that a large number of Gulf Coast persons were involved.

Gulf Coast contacts were most probably periodic rather than sustained and continuous. In either case, they appear to have increased in importance and intensity through time. Mound architecture may be the earliest trait to appear, but as mentioned earlier, the inspirational source for the few examples of Early Formative period mound architecture at Chalcatzingo is uncertain. Even Gulf Coast mound architecture is poorly documented for this period. It is Chalcatzingo's Middle Formative Cantera phase platform mound, PC Structure 4d, which is similar to Gulf Coast structures.

Other artifacts which may represent Gulf Coast influence do not appear in the Chalcatzingo artifact assemblage all at

once but range from early to late Middle Formative. Peralta Orange ceramics were first present in significant quantities in the Early Barranca subphase, and this type became increasingly popular through time. However, the most important attributes linking this ceramic type to the Gulf Coast, punctations and ridged necks on olla forms, appeared first in the Early Cantera subphase. Pavón Fine Grey first appeared in the Early Cantera subphase but became most important in the Late Cantera subphase. Three-pronged braziers, abundant in the Cantera phase, were first present in the Middle Barranca subphase. The chronological control on C8 figurines needs further refinement, but present data suggest that they occurred only during the Cantera phase. The dating of the site's monuments is also extremely tenuous, but their symbolism and iconography appear most similar to La Venta's period IV monuments, placing them also within the Cantera phase.

Unfortunately, it is difficult to draw specific conclusions from the occurrence of these traits within Chalcatzingo's chronological sequence because a good comparative sequence for the Gulf Coast Middle Formative has yet to be completely worked out. The sequence at La Venta is not well documented, that of San Lorenzo contains hiatuses, and the data from Tres Zapotes and Laguna de los Cerros are too scanty. For these same reasons, no specific Gulf Coast center can be designated as the source of the heartland traits found at Chalcatzingo.

Chalcatzingo and Southern Mesoamerica

While many artifacts at Chalcatzingo have counterparts in highland central Mexican Middle Formative assemblages and certain others in Gulf Coast assemblages, a few important traits which have not been specifically identified at heartland Olmec centers can only be designated as "southern Mesoamerican" (Guillén and Grove 1981). The most important example of this generalized southern trait group is Chalcatzingo's round altar and stela combination, Monuments 25 and 26. These Cantera phase monuments compose the earliest round altar–stela combination known in Mesoamerica. They have no specific antecedents. Such combinations occur at Izapa on the Pacific coast of Chiapas (Norman 1976:4), but they are currently dated as Late or possibly even Terminal Formative.

The earth-monster mask forming the basal section of the Monument 21 relief is a further example of a Late Formative Izapa-like motif which appears at Chalcatzingo during the late Middle Formative. Only one Gulf Coast monument (Mon. 1, Los Mangos, Veracruz; de la Fuente 1973: 159–160) carries this motif.

Within the Chalcatzingo ceramic assemblage were sherds from plate-like vessels with roughened bottoms (RD-2; Fig. D.3). Many of these sherds are strikingly similar to *comal* sherds of later culture periods. *Comal*-like plates have been recovered from Eo-Archaic levels at Yumela, Honduras (Canby 1949: Plates 3–5). These were found below strata containing rocker-stamped *tecomate* sherds, suggesting that the Eo-Archaic is probably Early Formative in date. *Comal*-like sherds occur also in Middle Formative Kal phase deposits at Chalchuapa, El Salvador (Sharer 1978: 125).

In southern Mesoamerica these plate-like forms may have functioned as manioc griddles. The probable lack of manioc in central Mexico as an important food plant, together with the presence of a lime deposit on field S-39 at Chalcatzingo, raise the possibility that at Chalcatzingo the plates could have functioned as *comales* for tortilla preparation. Tortillas are not normally considered to have been a Formative period food item.

None of the southern or Gulf Coast traits remained in the highlands following the end of Chalcatzingo as a regional center. Instead they disappeared or withdrew. None of these traits left a lasting impact on highlands culture.

Some traits, such as orange wares and three-prong braziers, are found both on the Gulf Coast and in southern Mesoamerica in general. Others, e.g., polychrome ceramics, occur at Chalchuapa, El Salvador, and Chalcatzingo, but have not been identified in the Olmec heartland. The impression given is that certain southern traits bypassed the Gulf Coast but appeared along the Soconusco coast and at Chalcatzingo. The Soconusco-Chalcatzingo distribution seems likewise reflected in the distribution of frontier monumental art, and at least hints at the possibility of a Pacific coastal interaction route through which frontier sites were linked and along which some southern traits moved.

The presence of certain widespread southern traits such as orange ceramics and three-prong braziers on the Gulf Coast and at Chalcatzingo has some im-

plications for the interpretation of Gulf Coast culture history. Arthur Andrew Demarest (1976) and Gareth W. Lowe (1977) have presented reconstructions of the culture history of the Gulf Coast and Chiapas which are in disagreement as to the direction of influences. Lowe argues that Olmec influences penetrated into Chiapas and the Maya area. Demarest, on the other hand, feels that late in the Middle Formative period there was an expansion from the Maya area into the Gulf Coast. However, orange ceramics and three-prong braziers are far more abundant throughout southern Mesoamerica than on the Gulf Coast, suggesting that they were traits adopted by Middle Formative Olmec culture. This seems to support Demarest's reconstruction, although it is obvious that both may be correct, for diffusion is not necessarily a one-way street.

WHAT WAS CHALCATZINGO?

In the years which followed the first publication on Chalcatzingo (Guzmán 1934), scholars proposed a number of hypotheses and ideas in print and informally concerning Chalcatzingo as a site as well as its relationship to Gulf Coast culture. The trend in these hypotheses is reflective of the nature of archaeological explanations for their times. The earliest ones evoked migration and/or colonization and often had a religious orientation. The most recent ideas are usually based on specific economic models which link Chalcatzingo to the Gulf Coast via trade or exchange.

In reviewing some of these ideas and presenting my own, it must be made clear that no model yet provides a completely satisfactory explanation of the processes leading to Chalcatzingo's development or its *raison d'être*. The great quantity of data recovered by our project raises in my mind more questions than it answers. For this reason I am certain that some of us will continue to review and reanalyze the data for years to come. In any case, a better understanding of Chalcatzingo will ultimately rest upon an increased knowledge of many other areas of Formative period Mesoamerica.

Direct versus Indirect Contact

Ignacio Bernal (1968:12) has suggested that some Olmec "colonies" existed in the highlands of central Mexico, including Tlatilco and, by implication, Chalcatzingo. However, at Tlatilco, an Early

Formative period site, "Olmec influences" are limited to a few design motifs on ceramic vessels and roller stamps, and the presence of C9 "baby-face" figurines. As mentioned at the beginning of this chapter, such traits are not restricted to Tlatilco but are found at every village or hamlet within the Tlatilco culture sphere for which we have archaeological data. Unless it is hypothesized that every settlement in the highlands during the Early Formative was populated by some Gulf Coast colonists, then the use of certain decorative attributes as a sign of direct Gulf Coast presence is improper.

The two major decorative motifs usually identified as "Olmec" are the "fire serpent" (cayman) and the "were-jaguar." Kent Flannery (personal communication) has pointed out to me that while such motifs are found on Gulf Coast ceramics, they seem to occur in greater frequency on Early Formative Oaxacan ceramics. The same could be true for central Mexico. This suggests that they are important for their symbolic value and that they cannot be ascribed as motifs derivative from any specific archaeological culture, at least based upon frequency within the total assemblage.

Flannery's archaeological work in Oaxaca has greatly clarified the nature of these motifs. Expanding upon the analysis which Nanette M. Pyne (1976) carried out on the Oaxacan ceramic data, Flannery and Joyce Marcus (1976b:381–382) point out that these distinctive ceramic motifs are generally found separated in different areas or wards of the village site of San José Mogote. Smaller settlements elsewhere in the Valley of Oaxaca seem to be associated with either one motif or the other. Flannery and Marcus and Pyne interpret the "fire serpent" and "were-jaguar" motifs not as signifying Olmec contacts or influences, but as symbols related to local Oaxacan lineages or descent groups. This interpretation seems likewise valid wherever the motifs are found in Early Formative Mesoamerica, including sites on the Gulf Coast and in Mexico's central highlands.

Olmec culture did not remain static over seven hundred or so years. By 900 BC the use of the "fire serpent" and "were-jaguar" motifs on pottery had disappeared. Also disappearing were ceramic baby-face figurines. Jade apparently replaced ceramics as the important medium for symbolism. On the Gulf Coast and throughout much of Mesoamerica,

white-slipped ceramics decorated with the double-line-break motif became common. The change is not as abrupt as portrayed by some scholars at this time (see Grove 1981a:378). It does reflect a general change in cultural symbolism and values which has yet to be adequately explained.

It is after 900 BC that a few sites outside the Gulf Coast manifested Olmec-like monumental art. As previously discussed, this art appeared in areas with no previous stone-carving tradition and indicates a very different type of "influence" than that which occurred during the Early Formative period. The Early Formative data do not seem to indicate direct contacts between the Gulf Coast and other regions. However, the appearance of Olmec-style monumental art at a few sites far distant from the Olmec heartland implies that during the Middle Formative period some direct contact did take place. Chalcatzingo is one site which apparently received such contacts.

Whether the Gulf Coast contacts at certain distant sites represent an actual colonization by Gulf Coast peoples is perhaps a matter of semantics. How many individuals from the Olmec heartland must be present at a site at any one time for it to be considered a colony? The preponderance of central Mexican-style ceramics and artifacts at Chalcatzingo suggests that it was inhabited primarily by people who were culturally highlanders. The Cantera phase data suggest to me that a few Gulf Coast individuals might have resided, if only periodically, at Chalcatzingo, but it is difficult to ascertain how many. Colonization implies a large group of individuals, and it seems improbable that any such large group, originally adapted to a tropical habitat and riverine agricultural system, ever resided at the site.

Religion and Militarism

Religion was undeniably always an integral and important facet of Mesoamerican cultures, and visible in the archaeological record from the Formative period onward. However, models based upon the idea of Chalcatzingo as a purely religious center ignore the site's many other equally important aspects.

In 1972, Carlo Gay (1972a) hypothesized that Chalcatzingo was an Olmec religious sanctuary. At the time his book was published our project had just been initiated, and Gay and others were unaware of the site's public architecture.

Because he thought Chalcatzingo lacked architecture Gay suggested that it might predate the Olmec heartland centers with architecture. This hypothesis was also consistent with his belief in non-Gulf Coast origins for Olmec culture (e.g., Gay 1972b). Our project's recognition and discovery of public architecture and residences from a community which functioned and grew over more than half a millennium demonstrate that Chalcatzingo was more than a religious sanctuary. It is clear today that the site's Cantera phase zenith is relatively late in the course of Olmec cultural developments in the heartland. We uncovered no data which would suggest that anything at Chalcatzingo is antecedent to the indigenous development of complex culture on the Gulf Coast now documented in the San Lorenzo stratigraphic record (Coe 1970; Coe and Diehl 1980; Grove 1981a).

Based upon the scattered distribution of Olmec-style art, particularly monumental art, Michael Coe (1965b:771-772) proposed that this art was diffused by "missionaries" from the Olmec heartland. This again was based on the assumption that such art is purely religious, which, as has been pointed out for ceramics and monuments, is not completely correct. At the same time, Coe (1965a:18; 1965b:775-776) felt that there was a militaristic aspect to the monumental art found outside of the Gulf Coast, and he interpreted the two central figures of Chalcatzingo's Monument 2 as carrying "war clubs." Jorge Angulo (Chapter 10) likewise identifies these same figures as warriors. The three other carvings from the same group (IB), Monuments 3, 4, and 5, can be interpreted as showing the domination of supine humans by animals with supernatural aspects (e.g., Grove 1972a:159). However, in these instances I consider interpretations of militarism and conquest to be completely subjective evaluations. While Olmec contacts with the highlands could conceivably have been backed by military protection, this is not demonstrated in the excavation data. Such hypotheses do not serve to answer the greater question of what a Gulf Coast army, or missionaries, or colonists were doing at this particular site in this particular valley in the central highlands, or why their presence or dominance should be communicated here and not elsewhere.

Trade and/or Exchange

Economic models often seem the most satisfactory to archaeologists, since archaeologists normally deal with non-perishable artifacts, often manufactured of materials which can be analyzed in terms of their ultimate sources (e.g., mines). Even so, these source data seldom satisfy the complexities inherent in these models.

A just criticism of all economic models is that they are overly simplistic. The acquisition of goods was seldom the entire motivation for trade and exchange, particularly among chiefdom-level societies. Often the symbolic power and status which a chief acquired in trade or exchange alliances was of equal or greater importance than the actual objects exchanged, and in fact those items may have been relatively few in number. This should be kept in mind as several economic models are discussed below.

In dealing with the Olmec heartland, it is obvious that most of the sumptuary items in the artifact assemblage were manufactured from materials not native to the coastal plains of southern Veracruz and Tabasco. Raw materials ranging from huge blocks of stone for monuments, or jade for jewelry, to more mundane materials such as obsidian for tools, were imported. The best source analysis data for any of the imported raw materials on the Gulf Coast come from San Lorenzo's obsidian artifacts. R. H. Cobean et al. (1971) have shown this obsidian came from many sources. However, no source area has yet yielded evidence of Olmec occupation or "influence." Since obsidian was a ubiquitous commodity during the Formative period, its exploitation and distribution were probably generalized and not subject to the more controlled patterns of exploitation possibly given to more valued substances.

By the Middle Formative period, jade had become one such valued substance. One of the first economic models proposed to explain Olmec presence in the central highlands of Mexico was Coe's "Jade Route" hypothesis (1965a:123; 1968a:194), which suggested direct Olmec involvement in the exploitation of jade sources in Guerrero. This basic premise is strengthened by the actual distribution of Middle Formative sites with monumental Olmec-style art. The central Mexican sites (Chalcatzingo, Juxtlahuaca, Oxtotitlan, San Miguel Amuco, Techaya, and Teopantecuanitlan, Guerrero) stretch across a mineral-rich area of

west-central Mexico. The distribution of the second group of sites along the Pacific coast of southern Mesoamerica (Pijijiapan, Piedra Parada, Abaj Takalik, Chalchuapa, etc.) perhaps reflects what can be hypothetically termed the Cacao and Motagua Jade Route.

Coe (1965a:123) has also suggested that Chalcatzingo was possibly a *pochteca* center which served to collect and warehouse highland materials for transport to the Gulf Coast. This hypothesis further assumes that sites in various parts of Guerrero served as ports-of-trade visited by these *pochteca*, where raw and finished materials were obtained. The entire *pochteca* concept implies a formalized merchant organization with highly structured trade mechanisms. Thus, Coe's hypothesis has come under strong criticism (e.g., L. Parsons and Price 1971), for it is unlikely that such a formalized trade organization had developed among Gulf Coast Formative period chiefdoms.

Although one part of the *pochteca* hypothesis appears unacceptable, the suggestion that Chalcatzingo may have functioned as a collection center or intermediary for goods ultimately destined for the Olmec heartland may have some merit. Such a function for the site was first proposed by Philip Drucker, Robert Heizer, and Robert Squier (1959:270) and later in my initial work there (Grove 1968c). Strict archaeological proof of such a function for the site is lacking, but there is circumstantial evidence in its favor. For example, Chalcatzingo's house structures are far larger than those known from other areas of Mesoamerica and may have served not only as residences but also for the storage of trade goods (Chapter 6). The site's location itself may relate to an important route of trade and communication (Grove 1968c; also discussed below).

The port-of-trade concept has been the subject of two recent archaeological efforts, one at Cozumel, an island off the eastern coast of Yucatan (Sabloff and Rathje 1975), the other near Kaminaljuyu in the highlands of Guatemala (Brown 1977:304–352). Ports-of-trade have been defined as communities (or regions) which functioned as neutral meeting places for trade. Ports-of-trade developed at political or geographical transition zones, such as political "weak spots" between two large states or empires, or at the border of major ecological zones (Chapman 1957:116; Revere 1957:52).

William Rathje and Jeremy Sabloff (1975) refine the definition, mentioning that ports-of-trade are located at a distance from powerful resource centers and may also have served as shrine centers.

Strictly defined, ports-of-trade imply administered trade, meaning that the trade was between states rather than simply between individual traders. It is questionable whether during the Middle Formative period there were two powerful states or chiefdoms such that a neutral area with a formal port-of-trade was necessary. While Gulf Coast centers working together as a unit could have served as one trading group, it is presumptuous to imply that a second cohesive and powerful chiefdom or other sociopolitical unit existed in the Valley of Mexico, Morelos, or central Mexico in general, as the second trading partner. If with further archaeological research Cuicuilco turns out to have been a major regional center contemporaneous with Chalcatzingo, then the role of Chalcatzingo as a port-of-trade or other type of intermediary between a powerful highland center and the Gulf Coast centers will have to be reconsidered. Today such data do not exist. In fact, Chalcatzingo's monumental art implies a one-sided relationship with the Gulf Coast and not the neutrality expected of a port-of-trade.

A one-sided relationship is one attribute of a "gateway city," Kenneth Hirth's (1978a) model for Chalcatzingo. Like ports-of-trade, gateway cities are located at transitional points at one end of a center's tributary area. They serve as the "gateway" to the resources of an extended hinterland. Gateway cities are characterized by having an elongated, fan-shaped service area spreading outward in a direction away from the center which they supply (Burghardt 1971). The service area feeding in to Chalcatzingo could have encompassed almost all of central and western Mexico.

A gateway city implies an administered collection of resources, but it does not require *pochteca*-like traders penetrating into distant regions. The materials or goods received from the hinterland service area could have been collected through many networks of indirect exchange and funneled to Chalcatzingo. Some items moving westward into the hinterland from Chalcatzingo might have originated on the Gulf Coast, while others such as iron ore and kaolin may have come from local, Río Amatzinac Valley, resources. In either direction, the

overall administration of the exchange and the temporary warehousing of goods would have been an important function for Chalcatzingo as a gateway community. If it was a gateway community, it will be important in the future to determine how Chalcatzingo was functionally linked to the Gulf Coast (for transport purposes, etc.), nearly five hundred long and mountainous kilometers to the southeast.

CONCLUSIONS

Concluding chapters in some archaeological reports turn out to be "just-so" stories, and, although this is seldom admitted, they are predicated as much upon the feelings of the author as upon the actual data. Thus, I want to make explicit that these final pages represent my interpretations and my feelings, which are in some disagreement with Hirth's more internal model in Chapter 21.

In terms of the processes leading to the development of Chalcatzingo and its distinctive features, I favor an economic model which includes the understanding that as trade and exchange took place, the symbolism of those acts may have been as important to the participants as the items themselves.

Since the time of my initial investigations at Chalcatzingo in 1966, I have felt that its location was very favorable in terms of routes of communication, not only for the passage of goods eastward but also for economic interactions with central Mexico and a large area to the south and west. Although Thomas Charlton, Angel García Cook, and others have discussed the possibility that the Valley of Mexico's Classic period eastward trade outlet passed through Tlaxcala (see García Cook and Carmen Trejo 1977), the data suggest that the Valley's Formative period link to the east was via a more southern route: the Amecameca pass into Morelos and then eastward. An important Aztec period trade route followed that same path (Jiménez Moréno 1966), which, after Amecameca, skirted the southern foothills of the volcano Popocatepetl, then moved southward in the Río Amatzinac Valley before turning eastward to Itzacocan (Izúcar de Matamoros). The Morelos area is also a logical junction point for goods or raw materials moving out of western Mexico toward the Valley of Mexico or eastward, for the rivers of Morelos all flow as tributaries to the Río Balsas.

The region is also accessible by land routes. Chalcatzingo, at the eastern end of the broad plains of Morelos, and a visible landmark from many locales in the region, does sit in a commanding "gateway" position for goods moving eastward. The mountain's sheer size, grandeur, and visibility—and because of these characteristics its strong symbolic importance—were undoubtedly factors as important in leading to the role it assumed as was its geographical location. In fact, because of the regional topography, more logical routes of travel across the valley bypass Chalcatzingo by several miles to the north or south (e.g., Gay 1972a:104). This is not a situation to which modern locational geography is applicable, such as the placement of stores and gasoline stations at the junctions of formalized highway systems. In this instance it is not the route which dictates the precise location of the site but the major centers served which dictate the general course of the route, even to the extent of detouring several miles off the most direct path. The "sacred mountain" aspect of Chalcatzingo cannot be divorced from the site's economic growth and development.

It has been mentioned several times in this book that during the Early Formative period a cultural cohesion existed across the Valley of Mexico and Morelos region which was manifested in ceramics. This I termed the Tlatilco culture sphere. The redistribution system within this sphere apparently also controlled the obsidian exploitation and distribution of central Mexico's two major Formative period obsidian sources, Otumba and Paredón. (The Pachuca source was not heavily exploited at this time.) Other regional commodities, including those from the Río Amatzinac Valley, likewise were redistributed throughout the sphere. Gulf Coast interaction with this sphere was only indirect.

The Río Amatzinac Valley lay within the Tlatilco culture sphere, and within the valley Chalcatzingo was the center of redistribution for local raw materials (kaolin, chert, iron ore for pigment) as well as for goods non-local to the valley, such as obsidian. It is probable that some of the valley's raw materials were in demand not only within the Tlatilco culture sphere but outside the sphere as well. Through Chalcatzingo's position on the sphere's border, Chalcatzingo's chiefs not only redistributed goods locally, but also had links with centers to the east (for ex-

ample, the Izúcar de Matamoros valley, and indirectly probably ultimately to the Gulf Coast as well). In fact the Chalcatzingo chiefs may have been the major eastward link for the communities (and chiefs) of the Tlatilco culture sphere.

By the end of the Early Formative period much of Mesoamerica had grown in cultural complexity and in population. Old interaction networks seem to have dissolved, and (at least in the archaeological record) regionalism seems to have increased. With the rise in population and many new regional centers came the increasing demand for both utilitarian materials and status exotics. While during the Early Formative period the demand in the Olmec heartland for highland raw materials was adequately served through a system of indirect exchange links, this seems to have changed during the Middle Formative. The increased demand for all commodities probably jeopardized the Gulf Coast Olmecs' previously secure supply. Their response to this supply-and-demand situation for exotic items such as greenstone and cacao seems to have been to establish more direct and formalized relationships with a few distant centers having the ability to provide the goods desired.

These relationships probably developed over time, and initially may have taken the form of alliances, including marriage alliances. I believe that the evidence of these reinforced exchange ties lies in the monumental art found at Chalcatzingo and a series of sites in Guerrero, as well as at a number of sites along Mesoamerica's southern Pacific Coast. Just exactly what is being commemorated in the introduced monumental art remains to be clearly defined. In some instances a regional chief may have symbolized his alliance by erecting one or more monuments, and through this display gained further regional prestige and power (e.g., Helms 1979:76). Even Gulf Coast rulers would have gained status and power by demonstrating to their communities their ability to secure scarce commodities.

The presence at Chalcatzingo of stelae and other monuments which deal with rulership can be interpreted in at least two ways. The carvings of specific individuals may represent the local chiefs who are symbolizing their ties to the Gulf Coast and thus their importance and power. Alternatively, those carvings may depict high-ranking Gulf Coast personages who at one time or another vis-

ited or even assumed administration of the community. Whichever interpretation one favors, it must be remembered that the entire concept of monumental art and its technology was imported into Chalcatzingo and must have included skilled rock carvers trained on the Gulf Coast. The monuments imply far more than a local chief copying a distant symbol system. Their presence emphasizes the importance of the individuals portrayed and their communication of power, and reiterates Chalcatzingo's ties, both real and symbolic, with the Gulf Coast. Those ties were not superficial, for ultimately communities throughout the Río Amatzinac Valley received certain attributes of Gulf Coast Olmec culture, and those attributes set the valley dwellers apart culturally from their neighbors in the central highlands.

Chalcatzingo's chiefs clearly had ties with other highland chiefdoms. Monument 21, if commemorating a marriage alliance (see Chapters 10, 27), may show that alliance to be with a center in Guerrero (Teopantecuanitlan?). In fact, several sites in Guerrero exhibit frontier monuments, and it will be instructive in time to see how they were allied to Chalcatzingo.

While a gateway function can be hypothesized for Chalcatzingo, actual demonstration of that function is difficult. Because of the importance of the symbolism of exchange, a center's role in such a system cannot be measured by simply estimating hypothetical quantities of goods in the system, for in these instances quantity can never match symbolic quality. We currently have no idea what quantity of goods a center like La Venta required, but it is safe to assume that the exotics they received were not only utilized locally but also went out in exchanges to establish new ties and alliances with other centers, near and far.

Exactly when and how the Middle Formative community at Chalcatzingo ceased to function is uncertain. The fact that the site's houses appear to have been cleaned of usable goods, rather than having been abandoned with objects still in place, indicates that the termination of the occupation was gradual and planned. That the abandonment was complete is documented by the lack of substantial evidence of a continuing Late Formative settlement. If any Late Formative occupation of the site did occur (Appendix H labels Late Formative Chalcatzingo as a "Small Village," an assessment I dis-

agree with), it followed a long period of abandonment.

By 500 BC in central Mexico we see new regional centers and increasing nucleation, at least partially supported by intensive agriculture in the highlands. Through the greater agricultural surpluses such intensification created, these highland centers soon eclipsed the Gulf Coast by gaining control of the procurement networks. Perhaps an analogy to Teotihuacan serves here. Developing centers on the periphery of Teotihuacan's control seem ultimately to have successfully competed with that major city for its once uncontested supply of imported food and raw materials and hastened its demise. Similarly, perhaps by 500 BC the Gulf Coast centers could no longer maintain long distance control of the symbolically reinforced exchange system which had facilitated their acquisition of a variety of commodities upon which their material and spiritual livelihood depended. If Chalcatzingo's major role had come to be that of a community which used its alliances throughout the highlands to acquire commodities desired on the Gulf Coast (and elsewhere in southern Mesoamerica), it may have become too specialized to survive when it could no longer fulfill that function.

In reality, a good terminal date for Chalcatzingo is lacking, as are any comparable dates for events in the Olmec heartland, and thus it is impossible at this time to actually determine whether Chalcatzingo's demise predated, postdated, or closely coincided with the end of Gulf Coast centers such as La Venta, Laguna de los Cerros, and Palangana phase San Lorenzo. Even if Chalcatzingo survived the Gulf Coast decline, its abandonment might still have been related to the developments which characterized the beginning of the Late Formative period in much of Mesoamerica—the rise of new, larger, and more nucleated regional centers, and a shift in regional populations to these centers. For Chalcatzingo the new center may have been Late Formative Campana de Oro (RAS-20), a few miles to the north.

RESUMEN DEL CAPÍTULO 28

El desarrollo del periodo Formativo en el sitio de Chalcatzingo no puede ser entendido si no se le estudia dentro del marco más amplio de acontecimientos contemporáneos en el Centro de México, en la Costa del Golfo, y en Mesoamérica en general. El primer asentamiento del sitio, durante la fase Amate, participó en lo que se ha llamado la esfera de interacción denominada "cultura de Tlatilco" en Morelos y el Valle de México.

La interacción económica en esta esfera puede ser inferida a partir de ciertos estilos cerámicos exóticos y a partir de análisis de obsidiana. Esta proviene, casi exclusivamente, de las fuentes de Otumba y de Paredón. Además, parece haber existido relaciones entre Chalcatzingo y la esfera de Izúcar (Las Bocas), al este.

Durante el Formativo Medio hubo mayor variación intra-regional en el Centro de México. Entre los atributos cerámicos que comparten las dos áreas se encuentran las vasijas de engobe blanco con motivos de doble línea interrumpida y los tipos comunes de figurillas, particularmente del C1 al C7. La alta frecuencia de figurillas C8 en Chalcatzingo indica algún tipo de ruptura con el Valle de México y evidencia, al mismo tiempo, la existencia de contactos con la zona de Izúcar de Matamoros. Por otra parte, la cerámica Pavón Fine Grey sugiere también posibles vínculos con el Oeste del estado de Puebla. El papel que pudo haber jugado Chalcatzingo en la integración del Centro de México durante esta época no está claro todavía, ya que el tamaño y la importancia de Cuicuilco en este tiempo no han sido valorados aún. Las hipótesis sobre el surgimiento de Chalcatzingo que aquí se presentan, se basan en el supuesto de que Cuicuilco no era, todavía, un centro mayor durante el Formativo Medio.

Por lo que se refiere a los contactos con la zona del Golfo, las similitudes estilísticas que existen entre los relieves de Chalcatzingo y los que fueron encontrados en el área Olmeca metropolitana han sido reconocidas desde hace tiempo. Pero el proyecto ha revelado, además, una serie de nuevos rasgos comunes, los cuales no aparecen en otros sitios contemporáneos del Centro de México. Entre ellos se encuentran: un componente cerámico formado por el Peralta Orange y el Pavón Fine Grey, braseros con tres

asas, y figurillas-retrato C8. Entre los artefactos no cerámicos se encuentran objetos de jade, como son los pendientes en forma de T y de pico de pato, y la figurilla de jade. Tanto Chalcatzingo como los sitios de la Costa del Golfo tienen en común los conjuntos arquitectónicos de montículos y plazas, pero todavía no se sabe con certeza si la arquitectura monumental de Chalcatzingo fué inspirada en un prototipo de la Costa del Golfo.

En cuanto a los monumentos, no hay duda de que los relieves de Chalcatzingo presentan muchas similitudes estilísticas con el arte monumental de la Costa del Golfo, pero existen también diferencias significativas. Estas son las que caracterizan el arte de Chalcatzingo y el de otros sitios con influencia Olmeca, como son Chalchuapa, Pijiapan, etc., y es posible definir un estilo artístico "Olmeca fronterizo." Este estilo pretende comunicar ideas un tanto diferentes, y frecuentemente, en una forma menos abstracta que la de los mensajes dirigidos al público Olmeca del área metropolitana, ya que los pueblos "fronterizos" estaban menos familiarizados con la iconografía y con el simbolismo de la Costa del Golfo.

Chalcatzingo posee dos conjuntos de artefactos diferentes: uno de ellos está relacionado con el Centro de México, y el otro con la Costa del Golfo. Este último complejo está vinculado con el liderazgo y el ritual, mientras que el complejo del Centro de México contiene elementos más utilitarios. Esto sugiere que los vínculos con la Costa del Golfo se daban a través del dirigente y que estaban ligados a sus funciones político-religiosas dentro de la comunidad. En Chalcatzingo, estos rasgos fueron combinados con el conjunto local de elementos, y, finalmente, difundidos por todo el Valle del Río Amatzinac. Los artefactos de la Costa del Golfo parecen haber sido introducidos a lo largo de varios siglos, lo cual permite pensar en contactos, poco frecuentes pero regulares, entre las dos áreas.

Chalcatzingo también tiene algunos rasgos importantes en común con el área llamada "sur de Mesoamérica": el altar circular combinado con la estela, que aparece por vez primera en Chalcatzingo; la máscara del monstro de la Tierra, que se encuentra en la base del Monumento 21; posibles comales, cerámica policroma y naranja, y braseros con tres asas que están presentes tanto

en la Costa del Golfo como en el sur de Mesoamérica. Estos datos parecen respaldar la teoría según la cual hubo una expansión del área Maya hacia la Costa del Golfo durante el Formativo Medio.

Ha sido elaborada una serie de modelos para explicar la transformación de Chalcatzingo en un gran centro regional. Estos modelos incluyen la hipótesis de que Chalcatzingo era una colonia Olmeca o bien un santuario religioso; pero este concepto ha sido rechazado gracias a la comprensión, cada vez mayor, de la presencia de la Costa del Golfo en Chalcatzingo y en otros sitios del Altiplano Central. Chalcatzingo es esencialmente un sitio del Centro de México. Los modelos económicos que consideran al comercio y/o al intercambio como el estímulo son más aceptables. El papel jugado por Chalcatzingo en cuanto a las actividades económicas intra-regionales aun no está totalmente claro y varias hipótesis han sido adelantadas, por ejemplo, las que consideran que Chalcatzingo era un centro de colección de tipo pochteca, un puerto de comercio o un asentamiento portuario. Tanto el modelo pochteca como el del puerto de comercio implican un nivel de complejidad cultural mucho mayor que el que alcanzara Chalcatzingo. En cuanto al concepto de asentamiento portuario, existen evidencias suficientes para apoyarlo. Los materiales recolectados en una de las áreas de servicio de la periferia, como son el hierro, la mena férrea, y el kaolín, pudieron haber sido canalizados hacia Chalcatzingo para su posterior transporte a otras regiones, por ejemplo a la Costa del Golfo. Paralelamente, Chalcatzingo habría administrado las materias primas importadas a la periferia. El área de servicio que abastecía a Chalcatzingo pudo haber abarcado casi todo el Centro y el Oeste de México. Chalcatzingo se encuentra situado cerca de rutas de comercio bien conocidas.

El desarrollo de Chalcatzingo como centro económico comenzó probablemente durante el Formativo Temprano, cuando funcionaba como un centro de redistribución para el Valle del Río Amatzinac. Hacia el final de este periodo, se habían disuelto las viejas redes de interacción, se había incrementado el regionalismo, y se habían desarrollado redes de intercambio más formalizadas. Chalcatzingo cobró nueva importancia como punto de contacto entre el Centro de México y otras re-

giones, principalmente la Costa del Golfo. La aparición de nuevos centros regionales en el Centro de México, así como la decadencia de los centros de la Costa del Golfo, a fines del Formativo Medio, contribuyeron a la abdicación progresiva de Chalcatzingo.

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