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Mayan Metate Ethnoarchaeology

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MAYAN METATE ETHNOARCHAEOLOGY

by

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Abstract

Manos and metates are ubiquitous at archaeological sites in Mesoamerica. Unfortunately, grinding stones are understudied, and thus, not much is understood about them. Understanding that archaeology is based on the use of analogy to infer past life-ways, little work has been done to create analogies specifically for manos and metates. The purpose of this thesis is to study modern grinding stones used by Mayans living in Guatemala to better understand manos and metates used by ancient peoples.

I worked for two field seasons in Guatemala recording the life histories of manos and metates used by the Q'eqchi' and K'iche', two contemporary Mayan groups. I conducted surveys with 97 people which highlighted the history of their grinding stones, associated cultural beliefs, their physical descriptions, and metate use-location. I also interviewed several men who manufacture manos and metates at two of the few existing metate quarries in Guatemala. After analyzing the information gathered, I determined many new ways to interpret manos and metates found within the archaeological record.

Some of the implications of my study are the identification of wear patterns and the behaviors that cause these patterns. I also show that manos and metates can be multi-generational and are often passed from one generation to the next. Taboos that determine how people handle and use grinding stones as well as other cultural beliefs are discussed in my thesis. I also compare the use-location of manos and metates among the modern Maya to help interpret the locations of these tools among the Maya of the pre-Columbian site Cerén, El Salvador.

Other contributions of this study include a correlation between the size and function of manos and metates and many ethnographic implications such as the manifestation

of gender roles through grinding stones and the gradual loss of cultural traditions due to economic development. Finally, this study has preserved information on the production and use of manos and metates. These traditional utilitarian tools will soon be abandoned by the Mayans of Guatemala and further study may not be possible.

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Table of Contents

List of Tables

Appendix B

List of Figures

1 Introduction

Manos and metates were likely the most important tools in ancient Mesoamerican houses. Unfortunately, grinding stones are understudied, and therefore not much is understood about them. An ethnographic study of modern manos and metates can provide information to aid in the interpretation of ancient grinding stones. My ethnoarchaeological research project involves the observation of modern metate use with the purpose of better understanding their ancient use. This research also documents behaviors associated with grinding stones during their production, acquisition, use, and discard.

Overview of Research

The purpose of this thesis is to collect, describe, and analyze ethnographic data that lead to a better understanding of the life histories of manos and metates found in the archaeological record. As mentioned, the analyzed data will help in the archaeological interpretation of manos and metates and in inferring the possible behaviors associated with them prehistorically.

I collected data in the Guatemalan Highlands in 2003 and 2004. My research focused on two modern Mayan groups, the Q'eqchi' and K'iche'. Surveys (Appendix A) were used to gather information on manos and metates. I visited homes during the 2004 field season to complete 97 surveys (see Appendix B). The first part of the survey included filling out a questionnaire that involved interviewing informants about the

use-lives of grinding stones in each of the 97 houses. I used the second part of the survey to record physical and historical information on the manos and metates found in each house; historical information refers to how the grinding stones were received, from whom they were received, the age of the mano and metate, and when they were received. The last section of the survey was dedicated to gathering information on the use-location of grinding stones in the homes of interviewees. A rough sketch was drawn of the mano and metate's use area in association with other household items and features.

My survey resulted in data on the life history of 168 metates and 165 manos. The questionnaire portion of the survey yielded valuable data on the frequency of grinding stone use, procurement, discard, reuse, and beliefs and customs associated with manos and metates. I also conducted an experiment that recorded four women grinding corn on their metates. This exercise was designed to determine the amount of time Mesoamerican women may have dedicated to grinding maize daily. Other outcomes of this experiment include behaviors associated with grinding that can explain wear patterns on manos and metates of archaeological context.

Scope

The theme of my thesis is that the study of modern manos and metates can yield information that may serve as an analogy for archaeology. There is a need to fill in the blanks on the life histories of grinding stones, such as their storage, breakage, and loss (Clark 1988). In addition, few ethnographic studies have been done to determine whether the size of manos and metates may indicate their function (Horsfall 1987).

Analysis of my data shows how manos and metates are valuable tools that last more than one generation. The study also demonstrates the idea that grinding stones were used extensively and were indispensable tools in pre-Columbian times. I also show how wear patterns form during use, and I identify the behaviors that cause these patterns. I

also illustrate how the location of modern manos and metates may help to interpret the provenience of grinding stones excavated in Mesoamerica.

The Need for Ethnographic Research: A Review of Past Studies

Apathy towards the analysis of manos and metates can be seen in much of the early archaeological literature. Little has been written concerning their role in daily corn consumption, and thus, grinding stones are discounted as only quotidian tools with not much information to offer (Haviland et al. 1985; Sheets and Dahlin 1978; Stiver 1992; Weeks 1983; Woodbury 1965). Here, I review four reasons why archaeologists have neglected to describe and analyze manos and metates.

First, the focus of attention during archaeological excavations in Mesoamerica tends to be on large ceremonial structures. Only mano and metate fragments are found, and they are usually located within the structural fill of these large buildings. Their provenience in ceremonial buildings does not contribute much to the understanding of manos and metates in the homes where they were likely used.

Alfred V. Kidder described his frustration with trying to complete a "thorough" analysis of ground stone found during the excavation of Uaxactun in the late 1930s when he said,

> In spite of the great amount of work that was done at Uaxactun, the total "take" of nonceramic utilitarian artifacts was very small. Scarcity of such artifacts has also been obtained at all other Lowland Maya sites that have been investigated. To some extent this is doubtless the result of the limited attention to which has so far been paid to house sites and middens, archaeologists having confined themselves almost exclusively to the excavation of temples and other ceremonial structures in and about which implements for daily use would naturally not have accumulated in quantity. (Kidder 1947:2)

Hattula Moholy-Nagy compiled Tikal Report No. 27, which highlighted the utilitarian artifacts of Tikal. She comments on the widespread apathy towards these types of artifacts: "A shortcoming of the sample reported here is that it was excavated and recorded in the 1960s, when there was even less interest than there is today in the objects used to facilitate daily life" (Moholy-Nagy 2003:1). Her report includes ethnographic interpretations of the manos and metates found at Tikal, although somewhat brief in description. Moholy-Nagy (2003:38) notes that vesicular basalt manos and metates may have been imported from the Guatemalan Highlands in pre-Columbian times. This information derives from the ethnoarchaeological work of Brian Hayden (1987), Scott Cook (1982), and Margaret Nelson (1987a; 1987b), whose contributions will be discussed in the next chapter.

A second reason why manos and metates are accorded little attention is that archaeologists do not think these tools can yield much information, other than their use in processing foods and other items (Schortman 1993; Woodbury 1965). The fact that manos and metates were used daily to process maize, the most important food to the Maya, lends to their importance.

A third reason for neglecting to analyze thoroughly manos and metates is their size and weight. Grinding stones can be difficult to transport, and they quickly fill up storage space. Martin Biskowski has worked with grinding stones found in the archaeology of Central Mexico. He has spoken with archaeologists who share this sentiment. He says that many archaeologists simply consider them "a huge pain in the [rear]" (Martin Biskowski, personal communication 2003).

Fourth, there are only a few ethnographic studies dedicated to manos and metates. Most deal with the technology used for their production (Cook 1982; Dary and Esquivel 1991; Garcia Chavez 2002; Hayden 1987a). Archaeology depends on analogy to interpret the materials found as the result of excavation. With so little ethnographic data to serve

as an analogy, it is harder to determine what behaviors may have caused certain patterns related to manos and metates in the archaeological record.

Theory and Method

The method I used to collect ethnographic information on modern manos and metates was ethnoarchaeology. This method is based on middle range theory, which was integrated into archaeology by Lewis Binford (1975, 1977, 1978). Middle range theory had been used in the late 1940s by sociologist R. K. Merton (1968). He used it to deal with the problems of abstraction, which were emphasized at the time in the field of sociology. The building of broad, unified sociological theories made them virtually untestable empirically, so Merton argued that middle range theories were a way in which these high-level theories could be tested (Maschner 1996:469). Subsections of the more abstract theories could be tested and combined. The results would help assess the validity of the high-level theories. The underlying purpose of middle range theory was to bridge the gap between high-level theory and theories that were testable.

Ethnoarchaeology is a way to use ethnographic observations to bridge the gap between present and past cultures. It is the "study of contemporary, ethnographic human behavior as a basis for explaining patterning and variability in archaeological associations" (Gould 2000:181). Nicolas David and Carol Kramer (2001:11) define ethnoarchaeology as "research that includes an ethnographic component and is carried out with the analogical needs of the archaeologist in mind."

The results of ethnographic observations are behaviors associated with similar materials found in the archaeological record. These observations can then be used as analogies, which are the foundation of archaeological interpretation. Binford (1967:19) defines analogy as "an inferential argument based on implied relationships between demonstrably similar entities." He also gives two characteristics of a successful analogy.

First, "if the initial resemblances are such that the inferred property would account for the resemblances, then the conclusion is more likely to be true" (Binford 1967:20). This means that a positive analogy can be justified if important properties are present in both sides of the comparison. Second, "the more comprehensive the positive analogy and the less comprehensive the inferred properties, the more likely the conclusion is true" (Binford 1967:20). In other words, "the more numerous the similarities between analogs, the greater the probability that inferred properties are similar" (Binford 1967:20).

Although ethnographic observations allow archaeologists the opportunity to understand behaviors associated with ancient materials, what happened in the past can never be accessed and viewed. Therefore, archaeologists have to use inference to determine any relationship between present and past behaviors. Clark (2002:262) said "everything that can pass for valid 'knowledge' or 'fact' in archaeology is inferential, and the basis of all valid inferences is observation of material traces surviving from the past." Analogies allow archaeologists to test and validate hypotheses made about the formation of the material record of past peoples. But in the end, "facts" in archaeology are still subject to the inference of the archaeologist.

Plan of Presentation

In this chapter, I considered how earlier studies of manos and metates are deficient in description and analysis. I also described the theory and methods that underlie my fieldwork and analysis. Chapter 2 reviews the ethnographic research that was specifically designed to answer archaeological questions about manos and metates (Clark 1988; Cook 1982; Dary and Esquivel 1991; Garcia Chavez 2002; Hayden 1987a, 1987b; Nelson 1987a, 1987b). This chapter also gives the reader a general idea of the processes through which manos and metates pass during their lifetimes.

The research design of my project appears in Chapter 3. I include detailed

information on the communities involved with this study as well as a brief history of the Q'eqchi' and K'iche'. I also explain the survey's structure and purpose. Chapter 3 includes a report of the results of both visits to Guatemala in 2003 and 2004.

Chapter 4 is the data portion of my findings during research in Guatemala. I describe all the data acquired on the production, use, discard, and reuse of manos and metates. Many cultural beliefs and practices related to grinding stones are included in this chapter. The grinding experiment performed by four women designed to estimate a daily grinding time is also in Chapter 4.

Chapter 5 shows how the information presented in Chapter 4 applies to archaeological interpretation. I first address wear patterns and the behaviors observed during fieldwork that contribute to the interpretation of patterns found on ancient manos and metates. Economic statuses of the Q'eqchi' and K'iche' are compared to the number of manos and metates in the house to determine whether there is a correlation between these two variables. Next, I address the use location as well as discard of manos and metates and how the study of modern grinding stone locations can help in interpreting the locations of manos and metates in ancient contexts. Finally, I analyze how the surface area of a metate may indicate its function (Horsfall 1987).

I conclude with explaining some of the ethnographic implications of this research (Chapter 6). The study of modern manos and metates led to a better understanding of the importance of these tools in the lives of Mesoamerican people as well as distinguished between gender roles. Chapter 6 includes a synopsis of the findings of my study.

2 The Life Cycle of Manos and Metates

Ethnoarchaeological Contributions to Groundstone Analysis

Ethnography includes the observation of behavior. There are a few archaeologists who have used ethnoarchaeology to understand behaviors associated with manos and metates. These studies are valuable sources of information and have been used by many archaeologists to strengthen their interpretations of groundstone artifacts. Some ethnographic research has focused on the production of manos and metates (Cook 1982; Garcia Chavez 2002; Hayden 1987; Nelson 1987). Brian Hayden (1987, 1988) directed a group of anthropologists in the study of lithic tools as part of the material culture found in Mayan houses. He also documented the production of manos and metates by men still using chipped-stone tools (Hayden 1987). John Clark (1988) collected ethnographic data on the use of grinding stones to explain the physical variability found among prehistoric manos and metates. His monograph also includes the most extensive analysis of manos and metates in the Mesoamerican region.

Grinding stones pass through many stages in their lifetimes (Figure 2.1). In this chapter I review the ethnographic work of the studies mentioned above to describe the research that has been done and what remains to do. The reviews of these studies will be presented starting with the production of manos and metates, then exchange and sale, use, discard, and reuse.

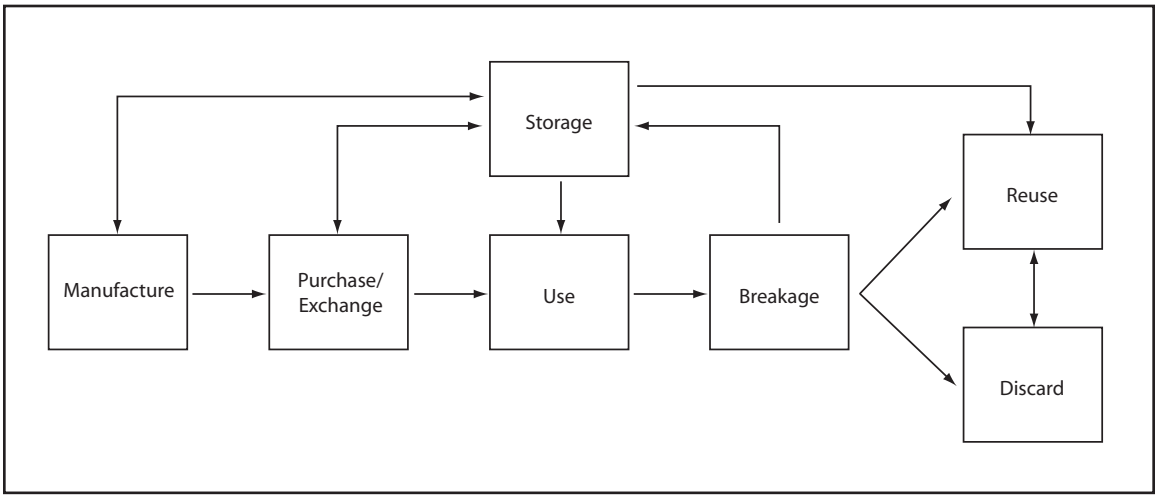


Figure 2.1. Life cycle of manos and metates.

Production

Scott Cook provides one of the most exhaustive ethnographic studies on the production and exchange of manos and metates in Mesoamerica. His monograph, *Zapotec Stoneworkers,* focuses on metate production as a pre-capitalist craft industry that has survived in a capitalistic economy. His research took place in the Valley of Oaxaca among the Zapotec. Cook thoroughly described the process of producing manos and metates as well as the complex market system in which manos and metates are sold. The metates produced by the craftsmen studied in Cook's research are three-legged with an unrestricted surface. The mano is held with two hands and extends over the edges of the metate grinding surface. These types of manos and metates were also used by the K'iche' in my study (Figure 2.2).

Cook studied three metate manufacturing villages of the Oaxaca Valley: San Sebastian Teitipac, San Juan Teitipac, and Magdelena Ocotlan. Each village housed a number of people involved in the production of manos and metates. Of the total population in these villages, 24 percent worked stone in San Sebastian, 11 percent in San Juan, and 19 percent in Magdalena (Cook 1982:129). Individual titles of metate

Figure 2.2. Elena Salquil, a K'iche' Maya of Santa Catarina Ixtahuacán, Guatemala, demonstrating the use of a three-footed metate.

manufacturers included *metateros* (those who remove stone from the quarries and make metates), finishers (those who complete metates from purchased blocks of stone or clean up crudely-shaped manos and metates), and traders (Cook 1982:129).

The process of production begins with the removal of stone from one of the many quarries in the region southeast of Oaxaca. The metateros in this region exploit a granitic stone, some of which is metamorphosed granite or granite–gneiss (Cook 1982:187-188). At the time of Cook's research, extraction of stone involved the use of explosives, steel wedges, sledge hammers, and heavy steel pinchbars (5-6 feet long) (Cook 1982:185).

First, the raw stone is cleaned of dirt and debris. If a boulder is too large to be cut into pieces by wedge and sledgehammer or with the use of a pinchbar, then holes are bored into the stone using the pinchbar or a smaller crowbar. These holes are filled and packed with a mix of explosive powder and wet dirt. A fuse is also inserted into the hole along with paper wadding and more damp earth (Cook 1982:192).

The result of blasting varies, and there are times when this step needs to be

repeated to dislodge an acceptable block of stone. After a *plancha* (large block of stone) is removed, the metateros proceed to cut *trozos* (blocks of stone the size of one metate) (Cook 1982:192). This process is performed by cutting into the stone with a *barreta* (a four foot pick) in order to create a hole where a wedge is inserted. The wedge is struck with a sledgehammer until the trozos are broken away from the "parent slab" (Cook 1982:193).

Cook (1982:193-195) records the processes involved in shaping trozos into metates. First, metateros use green leaves to make guide marks for cutting on the stone. Then the bottom of the trozo is truncated, which involves the lopping off of large pieces to form the bottom of the metate. Next, the areas around the proposed legs are "emptied" and within thirty to thirty-five minutes after truncating the trozo, the crude form of a metate is visible.

The last steps are refining and finishing. Refining involves "thinning out the body and legs" (Cook 1982:195). After the refining process, the metateros take the metate to a home workshop to finish it. There, metateros use a small hand pick to chip away at the surface area of the metate until it is smooth. In addition to picking, some metates are decorated with low relief sculpture and painting. These are sold at a higher price than undecorated metates (Cook 1982:195).

Cook (1982:198) describes the time generally allotted to each step in working the stone as follows:

> One day for quarrying ("*la sacada*"), one day for manufacturing the semi-finished metate ("*la echura*"), and one day for finishing the metate ("la *labrada*")…The metateros know that if quarry conditions are favorable or if they are successful with a blast on any given day, they can produce a finished metate in ten or twelve working hours – but this is not a predictable situation.
>
> In short, given a combination of subjective and objective estimates, we can reasonably assume that the 'social average' for labor-time required to produce a standard metate lies between an absolute minimum of ten

(10) hours and a maximum of 24 hours (3 work days).

Another two hours of work has also been calculated for the manufacture of "companion manos" (Cook 1982:198). Because of the size and shape of manos, they can typically be produced quickly. The work week was summed up by one of Cook's informants as follows: Monday, blasting of stone; Tuesday, blast again if Monday's work was unsuccessful; Wednesday and Thursday, sculpt metates at quarry; Friday (or Thursday *and* Friday if Monday's blast was productive), finish manos and metates; Saturday, take final products to market to sell (Cook 1982:204).

Cook highlights many other aspects of manufacture in his monograph. I will refer to them in making comparisons to the research results of my work among the metateros of Guatemala. But there are other studies that have been done on the production of manos and metates that are extremely important.

The Coxoh Ethnoarchaeological Project was a large-scale ethnographic survey of Mayan material culture. The purpose of this research was to collect data on "the manufacture, use, and discard of various classes of artifacts" (Hayden 1988:1). The information was to be used to understand the Colonial houses being excavated at the Coxoh sites of Coapa and Coneta in Chiapas, Mexico. Hayden's work with a metatero in the Highlands of Guatemala resulted in some surprising discoveries.

The most unexpected discovery was that of metateros still producing and using chipped-stone tools to manufacture manos and metates. Hayden came into contact with Ramon Ramos Rosario of Malacatancito, Guatemala, the only informant for this part of Hayden's lithic study. Ramon was a 50 year old metatero who showed Hayden the process of manufacturing manos and metates using stone tools. Ramon first produced grinding stones with stone tools when he began learning the process of metate manufacture (Hayden 1987b:10).

The first step recorded by Hayden (1987b:21-22) was the quarrying of metate blanks from the main quarry, 12 km away from the village of Malacatancito, or finding "suitable boulders for making manos and metates" in the riverbed, 3 km away. Because Hayden and Ramon did not locate boulders suitable for producing a metate, they had to go to the quarry where they decided to use steel tools for the removal of raw material. Steel wedges and chisels were employed to extract large pieces of stone from the bedrock. Hayden (1987b:22) was told that before metal chisels were introduced "it was necessary to excavate until a naturally suitable block of basalt was uncovered, which then could either be directly shaped or split into two smaller blocks for further processing."

The process of splitting such a block using stone tools was described by Hayden's informant, Ramon. Splitting a stone that would yield two metates would generally take one-half to one day (Hayden 1987b:24). The large stone was elevated onto a smaller stone that acted as an anvil. A groove was cut using smaller stone pics that would end up being several centimeters deep. The large basalt block would then be split by striking it on top with another boulder.

In his study, Hayden and Ramon decided to use metal chisels to cut a metate blank from the bedrock at the quarry after spending much of one day searching for suitable material in the riverbeds. They only found two blocks that were the appropriate size, but both were internally flawed (Hayden 1987b:24).

The next step was the procurement of pics from nearby riverbeds. A half a day (4 hours) was dedicated to this process.

> Ramon tested potential boulders for a number of important qualities. Testing for flaws was achieved by tapping specimens lightly and listening to the "ring" of the rock. Chips were removed to test the flaking quality, coarseness, and internal homogeneity of prospective pics. Once a sharp edge was created, it often was tested for penetration and durability by indenting some nearby vesicular boulders. Sharpness was tested by running finger tips along edges. Specimens were further tested for

> adequate grip and for porosity by wetting freshly exposed surfaces. If there was the slightest indication of a flaw on the surface of a piece, Ramon would hammer away at it repeatedly until the piece broke apart (Hayden 1987b:25).

After collecting 10 one-handed pics and 9 two-handed pics (only a few of which were used during the manufacture of the metate Hayden recorded), the metate blank was formed into a metate during three distinct reduction phases: rough cut of metate form (*estillar*), thinning (*repellar* or *adelgazar*), and smoothing (*afinar*) (Hayden 1987b:26).

Large two-handed pics were used for the roughing out of a metate. Substantial pieces of stone were removed to expose the dorsal side of the metate first and then the ventral. To do this, "acute- to right-angled platforms are used for points of impact" (Hayden 1987b:27). Hayden (1987b:28, 30; Figures 2.8 and 2.9) also witnessed Ramon cut his own platform into the side of a protuberance on the dorsal side (grinding surface) and remove the piece as a large flake with a few heavy blows to the platform. After roughing out the metate, Ramon transported the stone to his residential workshop to be completed.

There, Ramon began the next stage of thinning. Hayden (1987b:36) reports that few recognizable flakes were produced during this process because pulverization was common. Ramon also began using one-handed pics because the work was significantly more delicate, especially when thinning the ventral side around the legs of the metate. This stage included flattening the grinding surface, straightening the edges, and sculpting out the feet of the metate.

An interesting behavior observed at this point was the use of the pointed edges of the pics to grind in a linear motion, creating a groove with "sharp angles at the junction of the support with the body of the metate" (Hayden 1987b:38-39). The groove was used as a "stopline for subsequent chipping" (Hayden 1987b:39). Ramon then carefully chipped away unwanted material around and between the two distal legs

The last stage of manufacturing a metate with stone tools is smoothing. Hayden (1987b:41) explained how this was completed in two stages. First, one-handed pics were used along with "smaller, specialized smoothing stones" to abrade the surface of the metate in a swiping motion. Then, a mano was used to grind on the grinding surface for a few minutes to create a smoother surface. Finally, the metate was washed of any small, loose pieces of stone and fine powder (Hayden 1987b:41).

Hayden (1987b:44-46) also briefly recorded the production of a mano. It entailed searching for raw material in the riverbed, and after roughing out one that had broken due to flaws, a suitable boulder was found and roughed out. Two boulders used as pics were found in the same riverbed, one was pointed naturally, and the other of greenstone broke during roughing, but Ramon continued to use it for light pecking. After roughing, the mano was taken to a riverside workshop where it was thinned and smoothed, in a manner similar to that of the metate.

Travel to and from the quarry, procurement, and roughing out the preform metate took one day (Hayden 1987b:31). As mentioned, Ramon transported the metate preform to his home workshop after the first stage of reduction. This is significant because the metateros of Oaxaca (Cook 1982) take the metate to a home workshop only after initial roughing and thinning. This Oaxacan practice is consistent with modern metateros of at least two other quarries in Guatemala. In contrast, Hayden (1987b:27) witnessed that manos were generally finished at the workshops by the riverbed quarry rather than in a home workshop.

The extraction of a metate blank from the bedrock quarries located in the hills above Malacatancito took only 24 minutes (using steel tools), while the time for "roughing out" the blank, also while at the quarries, took approximately four minutes (Hayden 1987b:24-25). Thinning and smoothing in the home workshop was the longest process; it took ten hours and twelve minutes, and producing one mano next to the

riverbed quarries resulted in five hours and seventeen minutes (procurement time included). Hayden added about one to two days in the procurement of raw material for metates if stone tools were used. In Hayden's estimate, the total time to produce a finished metate set came to approximately 20 hours. These 20 hours of work were spread over four to six days to make one mano and metate using only stone tools (Hayden 1987b:48). This is quite impressive given that Cook (1982:198) estimated an average of 17.75 hours spread over five days to produce one mano and metate using modern steel tools.

A few others have also looked at the modern production of manos and metates. Raúl Ernesto García Chávez (2002) investigated the metateros and quarries of Xochiaca, Chimalhuacán, Mexico, which is located just east of Mexico City. He, too, reported the process of metate production, which started with clearing dirt away from the area where the basalt is extracted. Using large sledgehammers, wedges, and chisels, blocks of basalt are removed and then transported back to a residential workshop (Garcia Chavez 2002:138). This is different than Hayden's and Cook's descriptions of metateros. In their studies, basalt blocks were at least roughed out before transported back to a home workshop. Having motorized transportation to and from the quarries may contribute to the fact that those in Chimalhuacán do not rough out their metate preforms before they return to their workshops.

At their *taller* (workshop), García Chávez explains that the block goes through three phases of reduction. First, the general shape of the metate is marked on the block, and large pieces of basalt are removed with a chisel called a *punzón* (Garcia Chavez 2002:138). Second, another *punzón*, one with a finer edge, is used to take off smaller pieces stone. Third, the metatero uses a *máquina*, or a chisel with a wide edge, to smooth the surface (Garcia Chavez 2002:138-139). This three step process is very similar to Hayden's observations at Malacatancito.

Claudia Dary and Aracely Esquivel (1991) wrote a short monograph on mano and metate production in San Luis Jilotepeque, Jalapa, Guatemala. This is one of the only existing production centers of grinding stones left in the eastern part of Guatemala today. Dary and Esquivel also briefly documented the stages of excavation, creating a preform, and finishing. The major difference from the previous examples is the style of metate manufactured here. The metateros of Jilotepeque make a restricted (trough) metate with an accompanying two-handed mano that fits within the trough, which is pecked out of the grinding surface of the metate. This distinctly manufactured style is rarely found among archaeological artifact collections and may be an exclusive product of modern metate producers in the western portion of Guatemala.

Sale and Exchange

Cook (1982) also described the marketing of manos and metates in Oaxaca, Mexico. He presents an extremely detailed analysis of the structure of this marketing system, which includes information on competition, transportation costs, spatial patterns, circulatory routes, price determination, and other significant aspects.

The marketing of grinding stones in the Oaxaca Valley involves several different people with distinct roles. First, there is the *propio.* He is an "individual producer who sells products which he personally has manufactured" (Cook 1982:253). The *regatón* is "an individual who is not a native of the producing village and who buys metates for resale in his home village or elsewhere" (Cook 1982:253). Cook further explains that *regatones* can also be finishers of metates and manos. They purchase crudely finished products from metateros and complete the final stages of smoothing, making them ready to sell. On the consumer side of the market, *regatones* are those who buy finished products in big or small lots and resell them either at a local market, at "hinterland marketplaces," or in their permanent "stall" or "shop" located within a market (Cook

1982:253-254).

Cook (1982:252) also identified several routes of circulation through which manos and metates pass. For example, *propios*, from their home workshops, can sell directly to an end buyer, to a *regatón*, or transport his product to the marketplace to do the same. The end of this exchange arrives when the metate and mano "enter into the process of utilization in the individual consumer household" (Cook 1982:251).

A few instances of barter were also observed among the Zapotec metateros. Some of these cases included the trade of semi-finished metates in exchange for prepared food, dried beans, the use of an ox team, a crowbar, and even for "finishing services on three unfinished metates" (Cook 1982:256). There are also times in which the metateros do not sell or exchange their manos and metates at all, but rather give them to a bride who is a "relative or godchild" (Cook 1982:254). This tradition of gifting is also practiced among the Q'eqchi' and K'iche' of the Guatemalan Highlands and will be discussed in Chapter 4.

Dary and Esquivel (1991:9-10) explain that in San Luis Jilotepeque the retail prices of metates are determined by size as well as the distance of the marketplace from the quarry. The metateros sell directly to end buyers or will sell to middlemen (similar to the *regatones* of Oaxaca) who then distribute as far as Cobán, Alta Verapaz, and to the countries of El Salvador and Honduras.

Ramon, the informant from the Coxoh Ethnoarchaeological Project, sold directly to "store owners, *finca* owners, and the native population" (Nelson 1987a:155). The majority of his product has been sold at fiesta markets, usually in Chiantla, which is a short distance from his home in Malacatancito, Guatemala. He has also traveled to several other fiesta markets in towns in the highlands of Western Guatemala (Nelson 1987a:154).

The system of exchange and sale in Mexico and Guatemala has probably

drastically changed since pre-colonial times. Some of the most significant changes came with the introduction of motorized vehicles for transport and the use of coin or paper currency. But a principal location of exchange continues to be in marketplaces which usually are located in plazas. Cook (1982:257) explains the dual function of the plaza as "an arena of concentrated supply and demand where one can find buyers for what one brings to sell and sellers of what one needs to buy." Plazas are an integral part of the system of trade among the people of pre-conquest Mesoamerica and those who live in these areas today.

Use, Discard, Reuse

Most Mesoamerican ethnographies include at least a brief explanation of the use of manos and metates to process maize as an important part of a woman's daily chores. I review these studies in Chapter 4 and discuss the amount of time women spent grinding maize each day. Only a few ethnoarchaeological studies have been performed on the use and discard of manos and metates.

Clark (1988:83) describes ancient manos and metates as "probably the most essential implements in any household." He also gives a clear summary of the process of preparing corn for the production of the day's tortillas.

> The first step in preparing corn for consumption is to soak and then boil it in lime water; corn at this stage is called *nixtamal.* The corn is then washed, the cuticle removed, and the nixtamal drained…The nixtamal is ground in the kitchen or sometimes by an outside hearth; customarily it is ground three times, until it is fine enough for tortillas. (Clark 1988:88)

Clark studied use-wear patterns that resulted from the grinding motions of the mano on the metate. He identified specific wear patterns associated with the use of grinding stones such as the dog-bone shape of *brazos* (two-handed manos used on unrestricted metates), which is caused when the central part of the *brazo* becomes worn

after extensive use, and the ends remain unmodified (Clark 1988:91).

Clark (1988:91) also devised a way to calculate the amount of attrition on manos and metates. For example, the amount that has been worn away on a metate can be determined by "comparing the original thickness of the metate basin at the proximal end with the worn area (thinnest area of basin, probably near the distal end)" (Clark 1988:91). The attrition of manos that have a dog-bone shape can be measured by "extrapolating the curvature at the two ends to determine the original shape" (Clark 1988:91). The amount of missing stone can be determined by comparing the worn *brazo* to the original shape. Attrition rate would also be dependent on rock type, rate of use, resharpening practices, and the amount of corn ground (Clark 1988:91).

Another portion of Hayden's studies on stone tool use among modern Mayans showed that grinding stones were used for much more than just grinding maize. They were also used to process "coffee, sugar, cacao, pigments, spices, salt, chiles, vegetables, and other foods" (Hayden 1987a:188).

Hayden (1987a:191) also mentioned a few uses for broken manos and metates which include the following: temper grinders for pottery-making and grinding salt, pigments, sugar, coffee, and cacao. It has also been reported that broken manos can be used as hammerstones, stones for walkways, supports for tables, and structural fill (Clark 1988:94; Hayden 1987a:191).

To clarify, usable and whole mano and metate sets are rarely found in abandoned dwellings (Clark1988:94). Archaeologists usually find broken fragments that were discarded on purpose around the house. Clark (1988:94) also mentions that "little has been written about the actual storage, breakage, and loss of manos and metates." One purpose of my thesis research is to fill in the blanks on the behaviors that contribute to the storage, breakage, and discard of grinding implements.

Summary

The production and use of grinding stones is diminishing over many parts of Mexico and Guatemala and has already disappeared from many cultures located in this region. That is why the ethnographic studies reviewed in this chapter have been so important to archaeology. The behaviors explained in the research mentioned above attest to the importance of each one of the processes in the life of grinding stones (Figure 2.1).

Hayden's research on the use of chipped-stone tools to manufacture manos and metates provides the best comparison for what the metate industry of Mesoamerica may have resembled long ago. Cook has also added to the understanding of this specialty craft with a comprehensive account of the marketing and exchange of grinding stones. Clark's (1988) lithic analysis on the typology and use-wear patterning of grinding stones has provided detailed information on how to identify wear patterns on ancient grinding stones. He also presented ways to calculate the rate of attrition of manos and metates (Clark 1988:91).

But there are still questions about the daily use of manos and metates to be answered, such as the amount of time women spent grinding each day. The cultural beliefs associated with manos and metates that may affect their use, storage, or discard have also not been researched or reported. Other questions that I address later in my thesis include: What do people do with broken or worn out manos and metates? And how can the knowledge of the location of modern manos and metates assist in rebuilding a hypothetical model of an ancient Mayan home?

3 Research Procedures

Research Design Overview

Most data for this project came from interviews with a number of people from two Q'eqchi' communities and one K'iche' community. These areas of focus will be described in detail later in this chapter. The structure of each interview followed a questionnaire (see Appendix A) that was devised before the 2004 field season. In this chapter I describe my research, its design and structure, as well as the communities in Guatemala that were chosen for study. I discuss the format of the questionnaire and how it was used to collect information on the life histories of modern manos and metates. Other portions of my questionnaire focused on the beliefs and practice associated with grinding stones as well as a description of each one encountered.

2003 Preliminary Research

Before addressing the structure of the questionnaire, I consider the results of a preliminary visit to Guatemala in the summer of 2003 that led to the final design of my research in 2004. The purpose of the 2003 visit was to choose the communities in which I was to conduct my studies the following year. Among these, I located a family in each community that would be willing to provide room and board. I also contracted with a native guide to lead me to the homes of those who he felt would be willing to participate in the study.

Figure 3.1. Map of Guatemala and areas included in research.

Another reason for this preliminary visit was to track the routes of manos and metates in reverse order, starting with those that purchased grinding stones and finally ending with the manufacturers and the quarries within which they worked. The results

of this investigation first lead me to many marketplaces of several municipalities in Alta Verapaz, including Carcha, Chamelco, and Cobán (Figure 3.1). Subsequently, retailers in these markets guided me to Don Luciano Tun, the major distributor/wholesaler of grinding stones in Alta Verapaz, who lives in of the town of Chamelco (Figure 3.1). Luciano's role in the chain of distribution will be discussed later (see Chapter 4). Finally, I was led to San Luis Jilotepeque (Figure 3.1) in the department of Jalapa in Eastern Guatemala where metates are still produced by Pokom metateros.

I also familiarized myself with the areas around the quarries of Nahualá, Guatemala (Figure 3.1). John Hawkins guided me to this locale and informed me of the K'iche' metateros who still produce manos and metates there. While in Nahualá investigating the quarries, I searched for a nearby area where I could conduct surveys among the K'iche', preferably one where members of the community still used their grinding stones to process foods. Through the help of Hawkins and his students, I determined Santa Catarina Ixtahuacán (Figure 3.1) to be the community where I would spend time interviewing people for the survey in 2004. Fortunately, it was located only 45 minutes by car from the quarries, and this allowed me to work in both Ixtahuacán and Nahualá without spending a large amount of time traveling between these two locations.

Also during my preliminary research two distinct forms of modern manos and metates were noted. They are used in several areas of Guatemala, Mexico, Honduras, and El Salvador. Among the K'iche' of Sololá, Guatemala, an unrestricted grinding surface is characteristic of the metates of this region (Figure 3.2a). The distal legs of the metate are flat on the outer edges, but rounded on the inner edges. The proximal leg also displays a semi-conical shape with the outer edge being flat. This style of metate employs the use of a mano that extends beyond the width of the metate grinding surface (Figure 3.2b). This is traditionally called a *brazo* (arm), most likely due to its longer length in comparison to manos used on basin or trough metates. These unrestricted metates and *brazos* have also

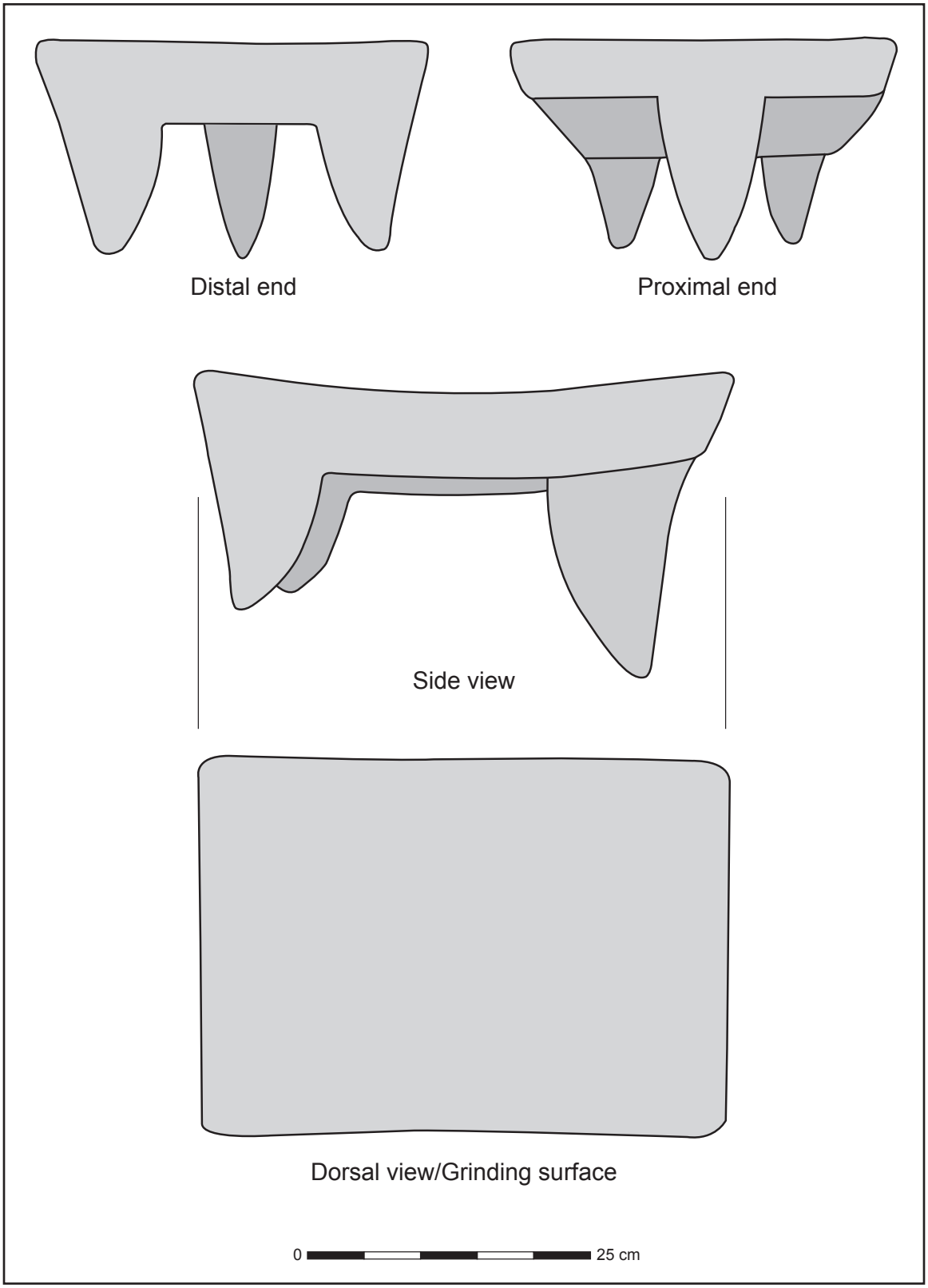


Figure 3.2a. Western style (unrestricted) metate.

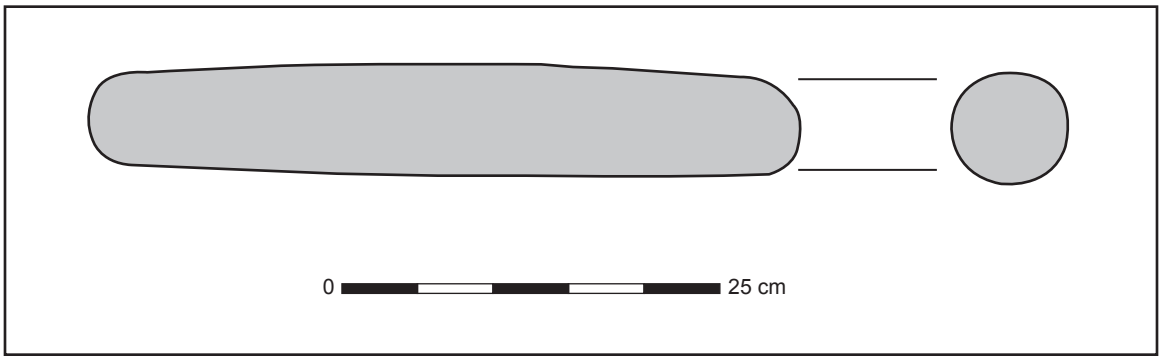


Figure 3.2b. Western style mano.

been reported to be produced and used as far north as Oaxaca, Mexico (Cook 1982) as well as in areas all over the western half of Guatemala (Hayden 1987b).

The Q'eqchi', and other indigenous groups of Eastern Guatemala, own metates that have a restricted or trough basin (Figure 3.3a). The distal legs of these metates are short and are cut at 45 degree angles on their outer edges and 90 degree angles on the inner edges (see Figure 3.3a). The proximal leg is longer than the distal legs, and the flat, outer portion of the proximal leg is cut in a V-shape, the point of which rests on the surface of a table or in a post. These metates are accompanied by a two-handed mano (Figure 3.3b) that fits within the recessed trough. The mano is lenticular in longitudinal cross-section and rectangular in transverse cross-section. The two broad, flat surfaces of the mano are used during grinding. In addition, these restricted, trough-style metates are distributed to El Salvador, Honduras, and many parts of Eastern Guatemala (Don Luciano Tun, personal communication 2003).

Information from the visit to houses in many areas of Guatemala during this trip in 2003 led me to conclude that these two types of grinding stones are the principal styles represented in Guatemala today and are generally found in opposing sides of the country. To distinguish between these styles I will use the distinction of "Western style" (Figures 3.2a and 3.2b) to describe those grinding implements used by the K'iche' in Sololá and

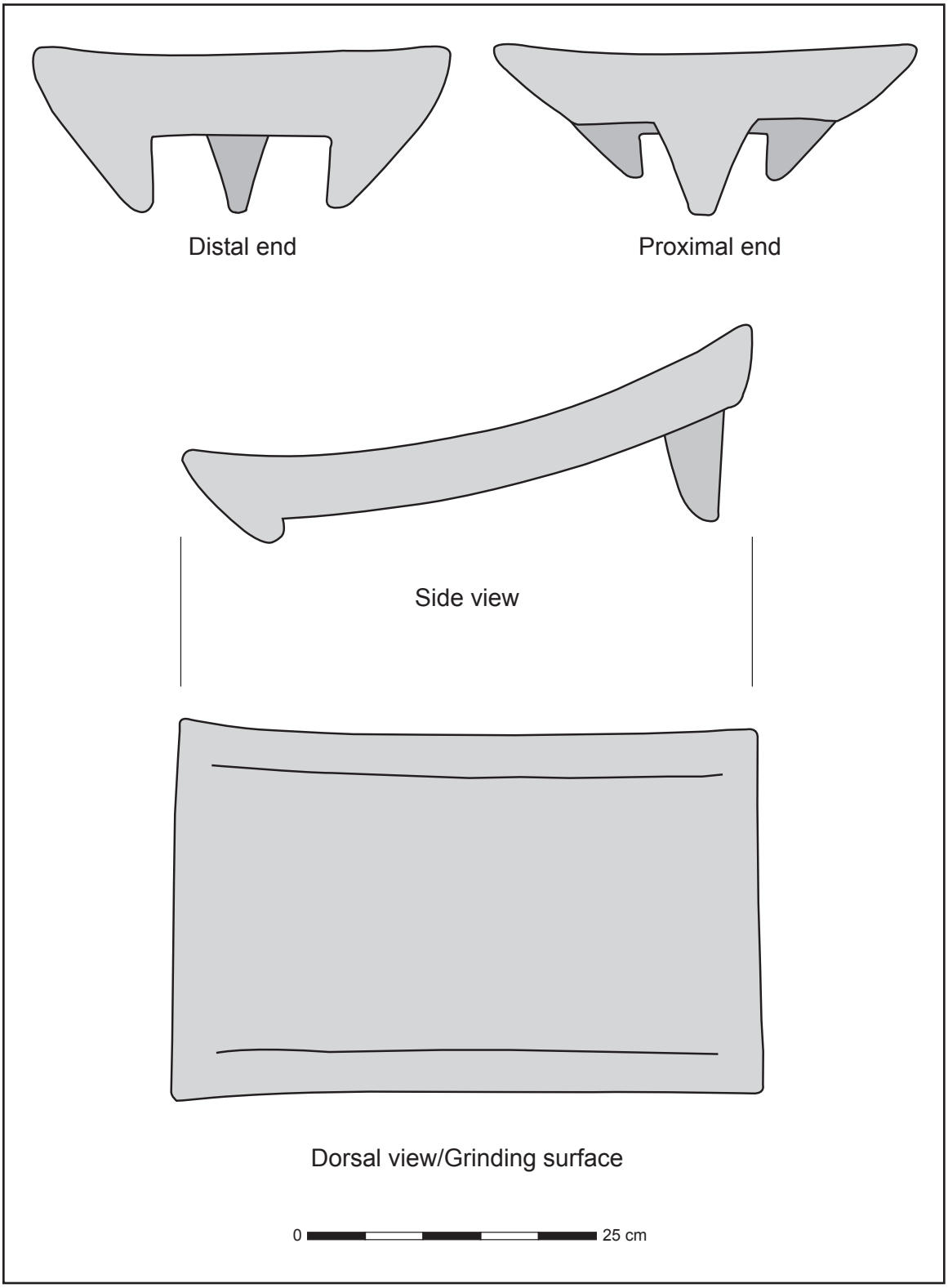


Figure 3.3a. Eastern style (restricted) metate.

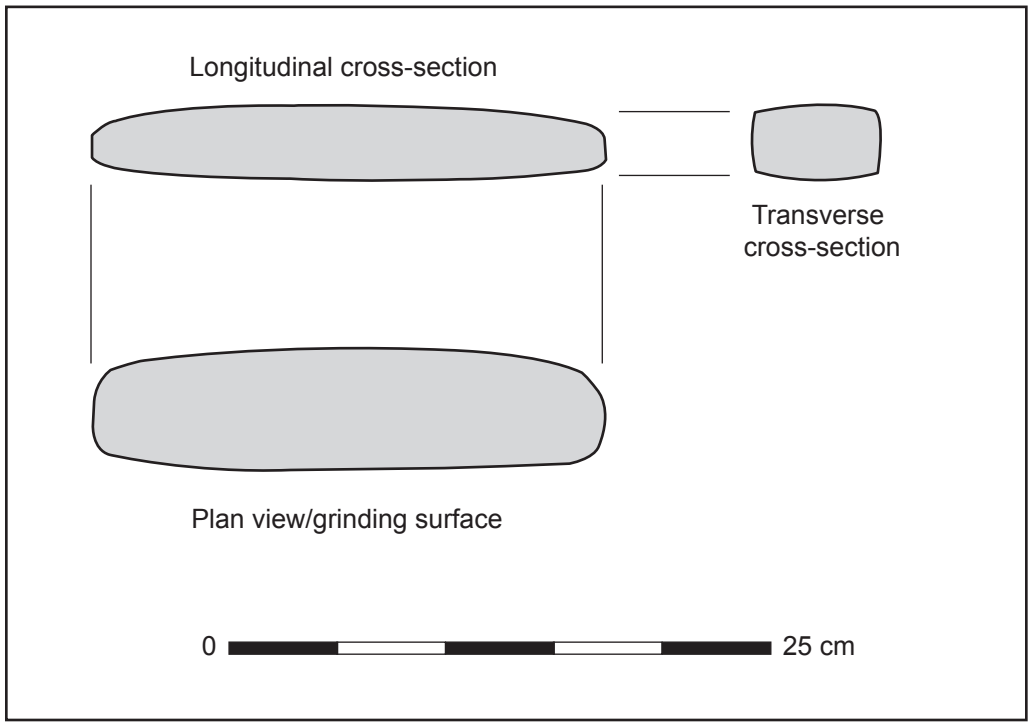


Figure 3.3b. Eastern style mano.

"Eastern style" (Figures 3.3a and 3.3b) to connote those used by the Q'eqchi' of Alta Verapaz.

Research Population

Choosing communities for my research involved two major factors. First, I was interested in determining who was using their metates most. Fieldwork in 2003 showed that more people were using grinding stones in less developed areas. For example, in communities without electricity or smaller villages that are located far away from large towns or municipalities, I found people using manos and metates to grind corn daily. This was usually because of inaccessibility to motor-driven or electric mills. By looking at different sized communities representing different levels of technological and economic resources, I hoped to find differences in the number of people using manos and metates as

well as reasons why many people no longer use them.

The second factor that influenced my choice of communities was my ability to communicate with the people. Time was limited and in order to gather information efficiently I needed to be able to complete about nine interviews a day. I was able to reach this goal among the Q'eqchi' communities because of my knowledge of their language. In contrast, my limited experience with the K'iche' and their language made it necessary to employ a translator, and surveys took twice as much time.

Most of this study took place in the department of Alta Verapaz, where the principal indigenous language is Q'eqchi'. As stated earlier, previous research and exposure to the Q'eqchi' provided me with a basic understanding of their culture and a proficiency in their language. Having already developed ties with members of communities all over Alta Verapaz, I decided that communities of this area would be the focus of my research. In addition, the Q'eqchi' frequently use metates for a final processing of corn and for grinding other foods. Many Q'eqchi' women use them daily, and some still use them to grind corn for every meal.

I also decided to work within the town of Santa Catarina Ixtahuacán, a K'iche' community in the department of Sololá (Figure 3.1). The main reason for choosing this town is because it is located close to the quarries of Nahualá and was a convenient place to conduct surveys while also working with the metateros of the quarries. In addition, it represented the largest community of my study. Electricity has been established there for many years. Ixtahuacán also has a central market that brings people from many surrounding villages (*aldeas*), making it an active social and economic center.

At one point in my studies among the K'iche' of Ixtahuacán, I concluded that I had made a rash assumption that people in this town and its outlying villages would be familiar with my type of informant-survey study and would be readily willing to participate. The K'iche' in and around Ixtahuacán had already been exposed to students

who had conducted research projects for a number of years prior, most in conjunction with the Brigham Young University anthropology field school. Unfortunately, their exposure actually worked to my disadvantage. More than any other place in Guatemala, my interpreter and I were turned away. Many people explained that they were tired of wasting their time helping with projects that resulted in nothing for them. Admittedly, my project was no different, and my endeavors were selfish in that it would not result in any kind of compensation for the informants other than a good feeling that they helped another foreign student complete a step in his education. Many others requested monetary payment for their information. These homes were usually passed over, but these difficulties in fieldwork resulted in a smaller number of homes surveyed among the K'iche'. The rest of this section will briefly summarize the history of these two regions of Guatemala and the communities involved in my study.

History of Alta Verapaz, Guatemala, and the Q'eqchi'

The written history of the Q'eqchi' begins at the time of Spanish colonization of the area of Guatemala now known as Alta Verapaz. Karl Sapper, a German geographer, took special interest in studying the historical geography of Alta Verapaz and surrounding regions at the end of the nineteenth century. His publications record the ethnohistory of these areas and provide informative maps designed to identify native place names rather than the Spanish-altered names used on modern maps.

In his 1936 paper called *The Verapaz in the Sixteenth and Seventeenth Centuries*, Sapper recorded the histories of the indigenous people of this area from many records kept by early ecclesiastical leaders who were involved in the conversion of thousands of people during and after the Conquest. He explained that several failed attempts were made to conquer this region during the time of conquest, and the Spaniards had decided to withdraw. Consequently, they named this area *Tezulutlán*, or "land of war."

At about the same time, Fray Bartolomé de las Casas had devised a plan to peaceably convert the people of Tezulutlán instead of raiding the towns and villages. The experiment was implemented, and even though Tezulutlán was renamed *Verapaz*, or "true peace," it does not mean that the people all peacefully converted. As a result of las Casas's peaceful conversion of the people in this region, many claimed that the Verapaz was essentially "untouched" for 300 years after the conquest. "Untouched" meaning they were free from the tyrannical bullying of the conquistadors. But a major tool for "peaceably" converting the people of Verapaz was through *reducciones*.

The *reducciones* forcibly consolidated the Acalá, Lacandón, Q'eqchi', Chol, and Pokonchí that inhabited the land of this region into centralized towns. The crown would provide military reinforcements to make sure those who opposed the *reducciones* would comply. The Acalá and Lacandón were originally found in the northwestern part of Verapaz while the Chol occupied all of the eastern and much of the northern parts. The Lacandón and Chol were especially known for their opposition to the *reducciones,* and some were reported to have raided the newly established Christian Indian villages (King 1974:23).

The Q'eqchi' and Pokonchí were principally located in the central highlands and to the south of Alta Verapaz ("Alta" refers to the area north of the boundaries placed between Alta Verapaz and Baja Verapaz [Figure 3.1]; Alta Verapaz is the primary region of the Q'eqchi'). Because of the *reducciones*, many of the outlying groups merged into the Q'eqchi' and Pokonchí, and adopted their languages. The Q'eqchi' and Pokonchí are the main groups living in Alta Verapaz today.

History of Santa Catarina Ixtahuacán, Sololá, Guatemala

The department of Sololá is located in the western portion of Guatemala in what is physiographically named the Volcanic Highlands (FUNDECE 1997:2). Three

different indigenous groups lived in and around Sololá before the Spanish Conquest: the K'iche', Kaqchikel, and Tzutujil. At one time they were part of a confederacy that included Rabinal (Carmack 1981:66), but this political organization eventually dissolved due to cultural, religious, and linguistic differences (Carmack 1981:69). After the K'iche' established their own political capital of Utatlán, they formed a smaller confederacy among themselves. It was comprised of three K'iche' lineages named the K'iche', Ilocab, and Tamub (Carmack 1981:69).

Some K'iche' of the Ilocab lineage inhabited the area of Ixtahuacán before the conquest. According to the *Título de los Señores de Totonicapán,* it was originally named *Sihá*, or "Flower of Water" (FUNDECE 1997:3). Similar to most towns in this region, it was eventually conquered and placed under Spanish rule. Many failed attempts were made on the part of the K'iche' of Sihá to fight against those enforcing tribute taxes, which went to the Spanish crown. Eventually, after independence was won from Spain, Santa Catarina Ixtahuacán was established as a municipality on 15 January, 1845 (FUNDECE 1997:3).

Pantoc

This *aldea* (village) is located about 4-5 miles from the municipality of Tucurú in Alta Verapaz (Figure 3.1). Situated high in the mountains above a tributary of the Polochic River, the community has been established there for over a century. The Q'eqchi' in this area live and work on land given to them by their great-grandparents and grandparents. Pantoc is also surrounded by coffee plantations, which provide seasonal employment for many within the community. A road was recently cut through the mountainous landscape in 2002-2003, thereby connecting Pantoc to another road that leads to its municipal town of Tucurú. Previous to the construction of this road, Pantoc could only be accessed by foot trail. Even though a road exists, it is principally used for

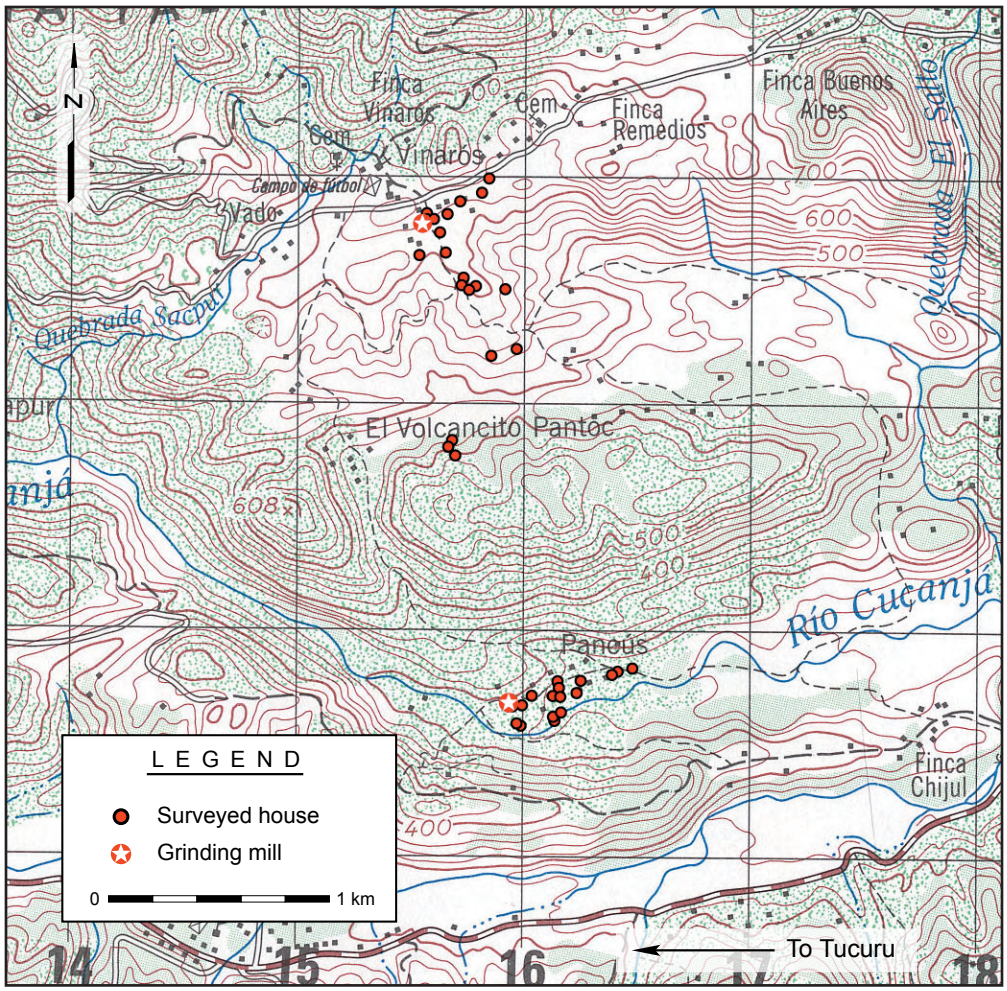


Figure 3.4. Map of the survey area of Pantoc, Alta Verapaz, Guatemala.

transporting agricultural products such as coffee by the coffee plantations Remedios and Vinaroz. The majority of outlying house clusters are still only accessible by hiking from the village center.

One reason for choosing Pantoc was to study a community that represents the smallest type of village/town. Pantoc has no electricity and lacks a central market and Catholic Church building that are common among larger villages and towns in Guatemala. In addition, there are only a few community grinding mills where people of Pantoc can get their maize ground (Figure 3.4). With the scarcity of mills, I determined that this location would yield a high number of people who actively use their grinding

stones every day. Furthermore, being able to observe people still grinding corn from nixtamal to masa would be invaluable for this research. Two of the six women who participated in my grinding-time exercise came from Pantoc. Observing them helped me understand the grinding process of maize as it was likely performed in pre-Columbian times.

Pantoc was the first area where I conducted the survey. My guide, Alberto Pop, and I visited with people in 37 houses (Figure 3.4). Most were very willing to answer questions and to allow us to examine their manos and metates. The people of Pantoc also provided rich information on the taboos associated with grinding stones, which is discussed in Chapter 4.

Chicojl

Chicojl is also a Q'eqchi' *aldea*, but it is part of the municipality of San Pedro Carcha (Figure 3.1), the second largest town in Alta Verapaz. Chicojl lies to the east of Carcha and is nestled in the depressions and hills of a karstic landscape. This community is spread out, but many of its members are related in some way or another, which results in a tightly knit group of people. Only three years ago electricity was introduced to the area, and water is mainly obtained by building holding tanks that collect runoff from the rain.

This village is representative of a slightly larger agrarian community than Pantoc. It has no village center, although the Catholic Church and many other protestant religions are represented. There is a major road (which was in the process of being paved during research in 2004) that connects Carcha to the tourist town of Lanquín. I chose Chicojl for my study to represent a village evolving into a larger town and being incorporated into a national economy. A major road cuts through this community and funnels in commerce. The road has provided Chicojl an opportunity for economic prosperity, which may simply

manifest itself in the form of tourist traffic or alternate venues in which community members may sell their cash crops of coffee and cardamom.

The people of Chicojl were good subjects for this study because they use their metates daily, and sometimes every meal, to prepare corn for tortillas. They were also a good community to compare with the Q'eqchi' of Pantoc. Many of the taboos and customs related to grinding stones recorded in Pantoc were repeated by those of Chicojl.

Alberto Che, a traveling salesman, worked as my guide, and together we visited 36 homes (Figure 3.5). Alberto was acquainted with many people all over the village,

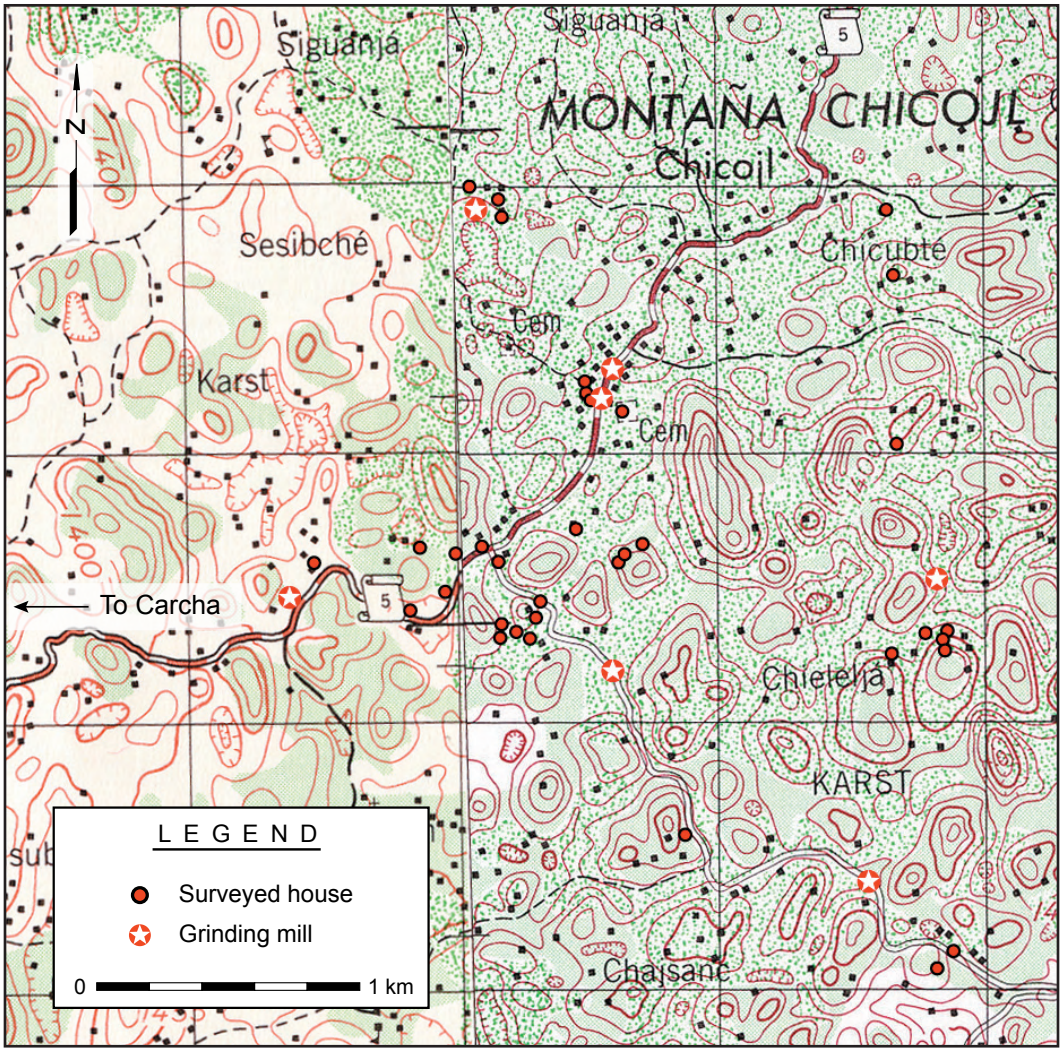


Figure 3.5. Map of the survey area of Chicojl, Alta Verapaz, Guatemala.

and our days were well planned. The same answers to many of my survey questions were repeated by several members of the Chicojl community.

Antigua Santa Catarina Ixtahuacán

Located in the department of Sololá, this municipality is predominantly inhabited by K'iche' speaking people. As stated, Ixtahuacán has been occupied by the K'iche' for centuries. This municipality is characterized as being mountainous covered with humid, subtropical forests (FUNDECE 1997:4). But due to its high altitude (2310 meters above sea level), the climate can be very cold in the winter season.

The K'iche' of Ixtahuacán do not use their manos and metates as actively as do the Q'eqchi' of Alta Verapaz. Unlike the Q'eqchi', there is no permanent use area within one room for their manos and metates. Grinding stones are typically rested against a wall, and when needed, they are brought out to a clear area on the floor. The distal legs are rested on a wooden board called an *ac'qeen* (Figures 3.6 and 3.7). The purpose of the *ac'qeen* is to catch any foodstuff that falls off of the distal end of the metate as it is being ground (see DVD chapter, "Grinding with the K'iche'"). The K'iche' of Ixtahuacán use the Western style of metate that has an unrestricted grinding surface that does not keep corn or other ground foods from falling off the edges of their metates. The person grinding may also put down a woven mat to cushion her legs from the floor.

Ixtahuacán represented a good example of an established town that has a number of communal grinding-mills (Figure 3.8). As mentioned earlier, it has had electricity for many years and facilitates a market on Thursdays and Sundays for neighboring *aldeas*. I chose Ixtahuacán for my study as a control for a large community where the use of grinding stones is beginning to diminish.

Ixtahuacán is also located only 45 minutes from the few existing metate quarries in Nahualá (Figure 3.9) where metates of the Western style are still produce today. Most

Figure 3.6. *Ac'qeen* being used to catch corn falling from metate as it is being ground (Santa Catarina Ixtahuacán, Guatemala).

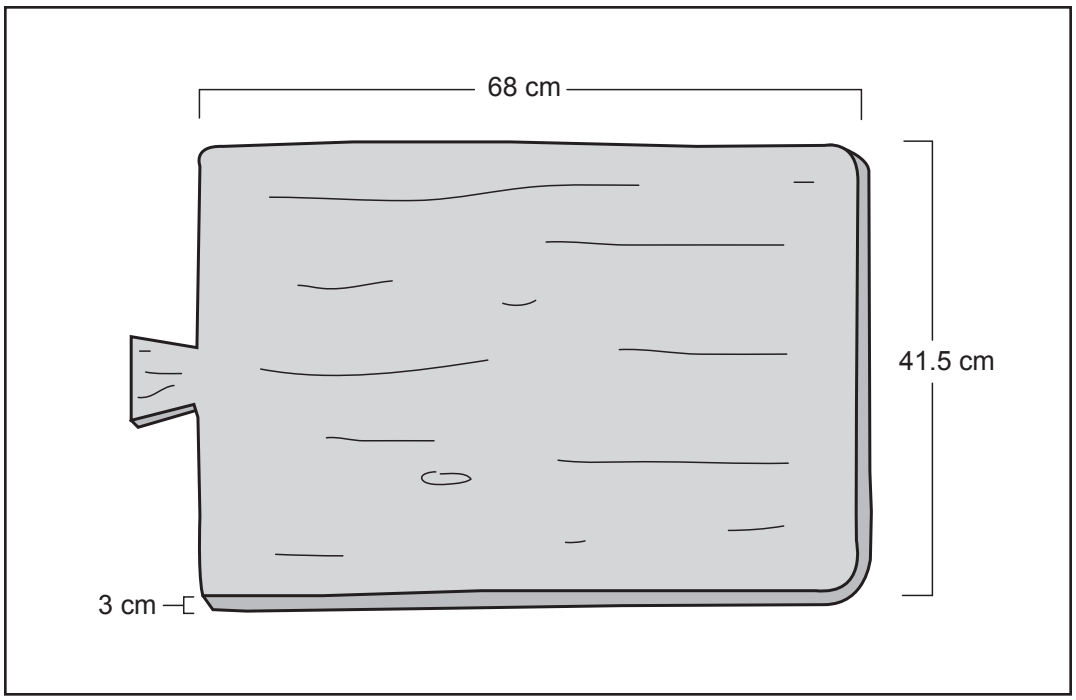


Figure 3.7. Wooden platform that distal legs of metate are rested upon (*ac'qeen*).

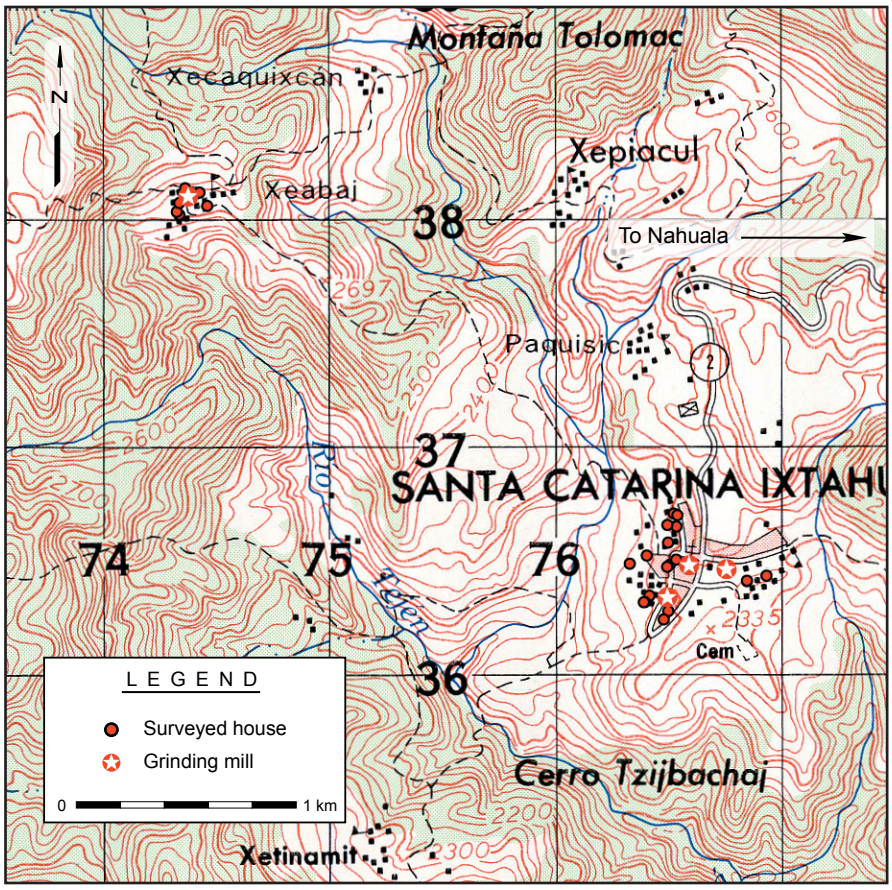


Figure 3.8. Map of the survey area of Santa Catarina Ixtahuacán, Sololá, Guatemala.

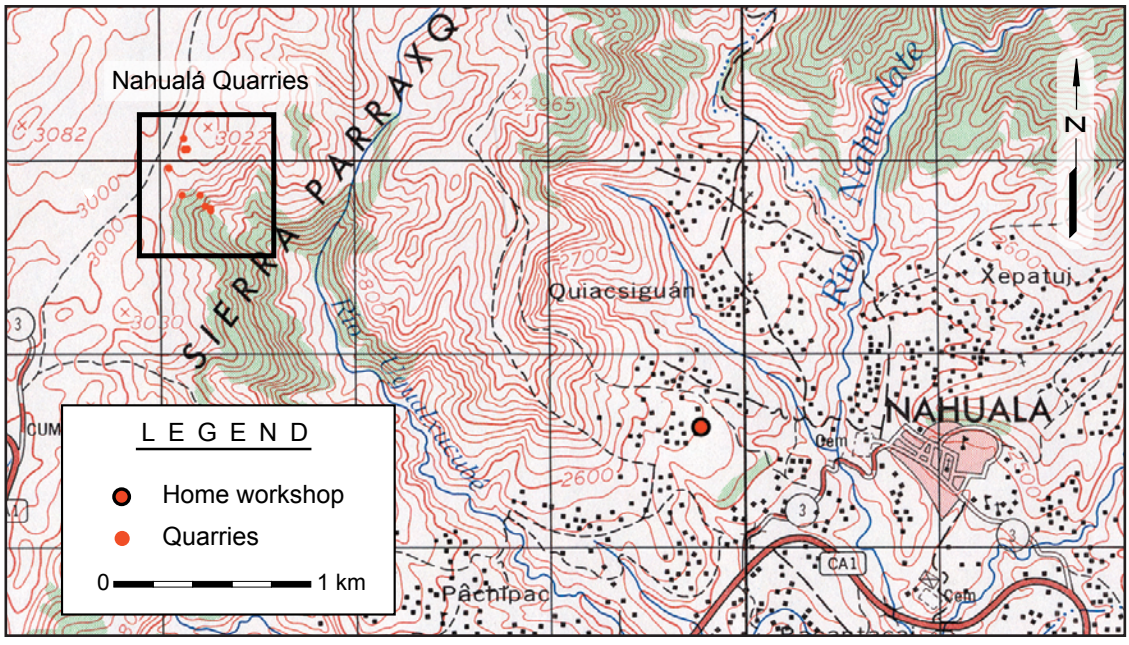


Figure 3.9. Map of the basalt quarries of Nahualá, Sololá, Guatemala.

of the people who participated in the study had purchased their grinding stones from the Nahualá market where a street behind the main market is dedicated to the sale of manos, metates, and other groundstone tools.

As stated, filling out the questionnaires (Appendix A) in Ixtahuacán took twice the amount of time that it took to do them among the Q'eqchi'. Lacking the language skills needed to perform the surveys myself, I employed Diego Telesfoto of Ixtahuacán to work as my interpreter and guide. We completed 24 questionnaires and were able to find two K'iche' women to participate in the grinding-time exercise. Part of my research was done in an *aldea* that lies to the north of Ixtahuacán high in the mountains. Xeabaj (Figure 3.8) is an outlying community where Diego felt they probably used their grinding stones daily. Unfortunately, they did not readily welcome our probing inquiries, but we were able to find a few families willing to participate in the survey.

Finally, conducting the survey with a different Mayan group gave me a chance to compare and contrast the customs related to manos and metates. Many similarities surfaced between the Q'eqchi' and K'iche' which will help to understand the role and importance of these tools in each group.

Questionnaire

The main focus of my research was to trace the life history of manos and metates from procurement, through consumption, ending at discard. To do this, I had to have an understanding of all the factors that influence the way they are handled over time. This includes their various uses, storage, sharpening of the grinding surfaces, breakage, and recycling. The questions of the survey were designed to address these processes.

The questionnaire was broken up into three different forms (see Appendix A). Form A was the interview portion of the survey and included questions that addressed topics such as the number of manos and metates owned, their history, taboos associated

with grinding stones, number of people living in the house, economic indicators, etc. Form B was dedicated to recording individual manos and metates, their descriptions, measurements, and any additional historic information. Finally, a grid for roughly mapping the use-location of manos and metates in the homes appeared on Form C.

Fieldwork for this part of research involved visiting the houses of a number of members of each of the communities. Typically my guide would take us to the homes of those with whom he was familiar. This produced the best informants, and they were always more inclined to let us enter their homes. They also were more willing to open up and provide detailed information that was normally not given at homes of those that I or my guide did not already know.

The visit would usually begin with my guide giving a brief introduction to the purpose of the research and then asking the informant for permission to proceed with the survey. Among the Q'eqchi', I would conduct the rest of the survey. Having an interpreter when working with the K'iche' made this process more difficult, and visits took twice as long. Typically I would dictate the question to my interpreter, Diego, in Spanish, and he would repeat it to the informant in K'iche'. The answer would be given and then repeated to me by Diego in Spanish.

Normally the visits would begin with first asking the questions located on Form A. Next, I would take measurements and write descriptions of the grinding stones located in the home on Form B. Last, if permitted to enter the home, I would sketch a plan map of the use-location of manos and metates on Form C. Detailed information on each of these forms of the questionnaire is described below.

Form A: Questionnaire

On this form, each house visited received a number that correlates to a point on the corresponding map as well as to the numbers assigned to each mano and metate.

Four main questions on each mano and metate were asked during the first part of the questionnaire as well: 1) Were the grinding stones bought or received as a gift? 2) From who were they received? 3) Where were they acquired? 4) When were they acquired? I also asked what a day's labor was at the time of purchase to get an idea how much a mano and metate may have been worth in terms of the number of days someone had to work to be able to purchase them. This question was rarely answered because most people said they had forgotten how much they were receiving for a day of work.

The next portion of this form dealt with frequency of use. I asked when and how often grinding stones were used. The next three questions addressed who uses the manos and metates: How many people use them, who uses them, and can men use them (why or why not?). Subsequent questions included what the grinding stones are used for, where are they used, and whether there are places they should not be used.

Pertinent to information on the discard of manos and metates, I would ask whether any manos or metates had been broken and, if so, whether they were being reused or just discarded. Few actually had broken these tools, although more manos were reported to have been broken than metates.

Due to the widespread use of community grinding mills, I asked how far and how often these mills were used. Also, if the informants owned metal hand-grinders, I asked about the frequency of use of these, as well. Asking how often people used resources other than manos and metates to grind corn resulted in discovering that some women still ground their corn solely on their grinding stones. This was most common in the village of Pantoc. Also, it helped understand how manos and metates last for a longer period of time than they may have prehispanically, when all the grinding was done on these stones.

Another question that received mixed answers was whether or not masa was reground on the metate after it had been ground at a community mill. Among the Q'eqchi', the answer was predominately "yes," but the K'iche' were divided on this

question. It depended on whether or not the person preferred a smoother texture to his tortilla, which resulted from giving the masa a final grind on the metate before making and cooking the tortillas.

An important part of maintenance is resurfacing and roughening the grinding areas on the mano and metate. This is usually done by taking the tip of a machete and pecking or roughing up the grinding surfaces of both the mano and metate. To address this aspect of grinding stones, I asked how often resurfacing was performed.

The next part of Form A dealt with how important the informants felt these tools were to them. They were asked if they had ever been without grinding stones and how this made them feel (or may make them feel). I was able to get an idea of how this tool fit into the hierarchy of material needs in these communities.

Included in this part of the questionnaire was a question that addressed the taboos associated with manos and metates. This produced many answers that led to an understanding of how these tools fit into the Mayan material world. It also helped to distinguish between gender roles and other gender related details. I think this question produced the greatest wealth of information about grinding stones that may never have been discovered through archaeological research.

Last, general household information was collected. The relationship of the interviewee to the rest of those living in the house was recorded to get an idea of familial living arrangements and how this may correlate to the distribution of the chore of grinding among the women living in the home. Also, the material construction of the house was noted (wall, roof, and floor construction materials) to determine the general economic status of the family living there. This method for estimating economic rank was used by students of Brigham Young University in previous fieldwork and proved to be a useful and non-offensive way of determining the economic status of families participating as informants (John Hawkins, personal communication 2004). In addition,

Susan Blake (1988:37) found that there was a positive correlation between houses built of certain types of material and economic rank in the Coxoh Ethnoarchaeological Project of adjacent Chiapas, Mexico.

Depending on how well an interview was progressing, I would ask any number of miscellaneous questions that I found fit at the end of Form A (Appendix A). These included the cost of a number of items associated with food preparation such as, pots, water jars, hand-grinder, and the daily cost of having corn ground at the mill. The price of other cooking tools in comparison to the price of manos and metates gave a good idea of how these tools were valued in comparison to other less expensive ones.

Form B: Measurements and Descriptions

Form B (Appendix A) was made for the purpose of recording the measurements as well as the descriptions of each mano and metate found in each house. It also provided more space for the recording of additional historic information, such as how the grinding stone was received (purchased or given as a gift). The reason for recording the use-life of manos and metates is obvious given the scope of this project; it aids in reconstructing the life histories of grinding stones.

Also, physical descriptions helped in understanding the wear patterns that can form over years of use and what new manos and metates look like before they have been used. In addition, the stone type was recorded. Although all but one grinding implement (a mano) was made of vesicular basalt, the native name of this type of basalt among the K'iche' shed light on an important aspect of how people determine the difference between good and bad quality stone used to make grinding stones.

Gayel Horsfall (1987:352) said, "There is minimal information in the ethnographic literature concerning the possible relationship between grinding stone size and function." She also mentioned that the little information there is suggests that

"differences in size may be related to differences in function" (Horsfall 1987:352). Measurements of manos and metates helped identify the correlation between sizes of metates and the types of materials ground on these different sizes.

Form C: Use-Location Mapping

The last part of the survey was Form C, which was used to sketch the mano and metate usage area. Most grinding stones were used in the kitchens of houses among people in both K'iche' and Q'eqchi' communities. I would draw a plan view of the room in which the mano and metate were used. The purpose of these data was to see whether there was any correlation between the location of common household features or artifacts and the location of grinding stones. For example, were metates normally located next to the hearth? This information will be presented in Chapter 5 when comparing data from this ethnoarchaeological research to rapidly-abandoned sites of Mesoamerica.

2004 Fieldwork: Surveys and Data Collection

In most cases a female in each house was interviewed, and occasionally the male head of household would answer all my inquiries. Only 15 of the 97 people interviewed were men, and this was usually due to the fact that surveys were conducted during the work hours of the day when men are out of the home. But in many cases where the male head of household was present, he had the wife answer the questions because grinding is the role of women, and the questions were focused on their tools, the mano and metate.

The majority of families visited had at least one mano and metate set, and some owned up to four. By the end of the research in June 2004, 97 houses had been surveyed, and data on 168 metates and 165 manos had been recorded (Appendix B, Table 4 and 5).

In addition, six women participated in a grinding exercise (two from each community) in which the time for each stage in the process of preparing/grinding corn

for tortillas was documented in detail. Only four of the six women fully completed the exercise within the bounds set by me (see Appendix C). The results of this experiment are described in Chapter 4.

Also, during this field season I visited the Nahualá basalt quarries, where the Western style mano and metate are produced. I interviewed seven metateros who answered questions concerning the production and sale of grinding stones. They were excellent resources for understanding things such as what characteristics define a well-made metate, how to choose stone for making manos and metates, how long does it take to produce one set, where are the grinding stones sold, and for how much are they sold.

I was unable to revisit the quarries of San Luis Jilotepeque, Jalapa, in 2004. Due to a nation-wide strike against rising taxes, all major roads into and out of Guatemala City were closed by protesters, which made it impossible to travel to Jilotepeque at that time. Fortunately, my work during the 2003 field season included a visit to the Jilotepeque quarries where I was able to interview two metateros about the production of Eastern style manos and metates (see DVD chapter, "Jilotepeque Metateros").

Summary

Even after the first few interviews were conducted, it was obvious that some questions were either poorly written, poorly presented, not understood by the interviewees, or the data would not be necessary. Given these situations, I did not ask some of questions on the questionnaire dependent on the circumstances. For example, many people could not remember the day's wage at the time they had purchased their metate, which had occurred many years earlier. Also, some questions, especially when translated into Q'eqchi', sounded repetitive, and consequently some of these were not asked (see questions 27, 29, 34, and 36 on Form A, Appendix A).

As the data tables show (Appendix B), there are questions that were not

answered, and this was due to many factors. In some situations the informant would simply not know the answer. Many people would not remember when grinding stones were purchased or how much they cost. Others did not feel comfortable in this type of situation, where they were bombarded with over 40 questions. Those who were uncomfortable usually were more reluctant to let us into the home, or if they did agree to our inquiries, they were reluctant to answer our questions. This usually resulted in asking fewer questions.

Some of the measurements on manos and metates were also left unrecorded due to the informants not being willing to show us all of the grinding stones in the house. Usually they were in storage in another room, and the owners did not want to move them. Along these same lines, if we were not permitted to enter the home, then plan maps of usage areas for manos and metates were also omitted.

4 New Ethnographic Information on the Life Histories of Manos and Metates

Introduction

In this chapter I discuss each stage in the life of the mano and metate in chronological order. I present the data from my research in Guatemala in 2003 and 2004 that adds to the ethnoarchaeological studies reviewed in Chapter 2. I begin with data collected on the production and sale of manos and metates. Customs and behaviors related to the exchange of grinding stones are also described. Information concerning the use-life of grinding stones follows, which proved to be the most extensive of my research. I consider taboos related to manos and metates, use frequency, metate resurfacing/resharpening, and the amount of time dedicated to daily grinding. I finish with discard and reuse data also collected during fieldwork.

Production

While in Guatemala, I visited two quarries on opposite sides of the country: Nahualá and San Luis Jilotepeque (Figure 3.1). I interviewed seven metateros about the details of the manufacture of manos and metates. Much of the data collected from these interviews and observations were similar to the information gathered by other anthropologists (Cook 1982; Dary and Esquivel 1991; Garcia Chavez 2002; Hayden 1987; Nelson 1987). Many new details also surfaced concerning aspects of mano and metate production such as physical characteristics of manufacturing areas, the

significance of the color of stone, measuring and standardization, and the patrinlineal tradition of metate manufacture.

The production of manos and metates among the Pokomam of San Luis Jilotepeque and the K'iche' of Nahualá has much in common with the production of grinding stones by other metateros in Mexico and Guatemala, described in Chapter 2 (Cook 1982; Garcia Chavez 2002; Hayden 1987; Nelson 1987). Among these ethnographic studies, only Hayden (1987) found metateros still using stone tools to manufacture manos and metates. All the metateros I observed in 2003 and 2004 were using steel picks and sledgehammers to form grinding stones.

Extraction of raw material by both the Pokomam and K'iche' metateros includes digging down to the large boulders, underneath many feet of soil in some cases. After the dirt is cleared, the metateros use explosives and/or pry-bars to extract large pieces of basalt. From these large, crude blocks they remove metate-sized slabs. The slabs are separated from the large block by pecking out linear pits (Figure 4.1) and inserting steel wedges that are hammered until a break separates the slab from the block. From this stage, the removed slab is usually carried to an area where it is worked further.

Manufacturing and Work Areas

As mentioned, metateros first extract stone, which is usually from land they own or rent. In the case of the Jilotepeque metateros, they pay the landowner of the quarries (see map, Figure 4.2) one metate per month for permission to remove stone and work on the land (Mario Gonzalez, personal communication 2003). Manuel Ramirez Guachiac, a metatero in Nahualá, said that he owns a small plot in the quarry. This means that he is restricted to removing basalt from that section of the quarry. It is obvious that some areas have been heavily exploited for raw material whereas others have not. Deep holes (Figure 4.3) and work areas with massive amounts of debitage support this observation.

Figure 4.1. Linear pit pecked into a basalt boulder (Nahualá, Guatemala).

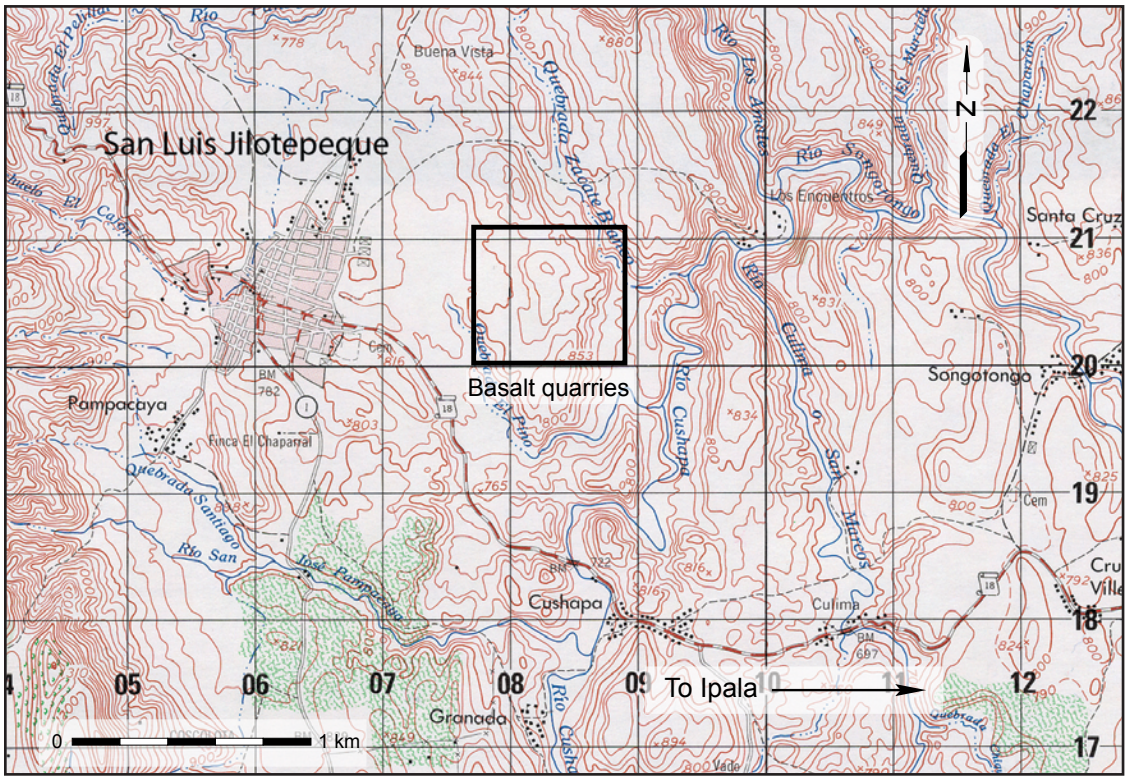


Figure 4.2. Map of San Luis Jilotepeque quarries in the department of Jalapa, Guatemala.

Figure 4.3. Large hole resulting from the extraction of a basalt boulder at the quarries of Nahualá, Guatemala.

The first step in extracting stone is to remove any rocks or debris. Mario Gonzalez from Jilotepeque showed me where he and his son had to dig two and a half meters before they reached a basalt boulder (see DVD chapter, "Jilotepeque Metateros"). Some metateros use explosives to remove slabs from a boulder, but others use picks or pinchbars to create holes where wedges are inserted. Sledgehammers are then used to strike the wedges and remove large blocks from the boulder.

These blocks are then split into metate-sized slabs in a similar manner. Picks are used to make holes and wedges are inserted and struck to break the blocks into slabs. This is similar to the technique used by Oaxacan metateros described in Chapter 2.

After stone has been extracted from the ground and split into slabs, Manuel Guachiac said they move away from the location of extraction because the ground is too soft around this area. For the metateros at the Nahualá quarries, there are a number of

areas that are established as working areas. The ground in these places is packed hard from the pounding of hammers and picks on the blocks of basalt (see DVD chapter, "Nahualá Metateros"). The hard ground allows the force of the pick or hammer to be focused on the stone instead of being absorbed into soft ground.

Dary and Esquivel (1991:8) report that some work areas in Jilotepeque are covered by a thatched roof or trees in order to protect the metateros from sun and rain (see DVD chapter, "Jilotepeque Metateros). I observed that work areas are generally kept clear of the large pieces of stone that have been removed from the metates and manos being worked. These pieces are usually tossed to the side of the work area, which results in a large accumulation of debitage around a cleared work space.

I also observed that most of the work areas were naturally elevated platforms (see DVD chapter "Jilotepeque metateros" and Figure 4.4). The large pieces of stone removed

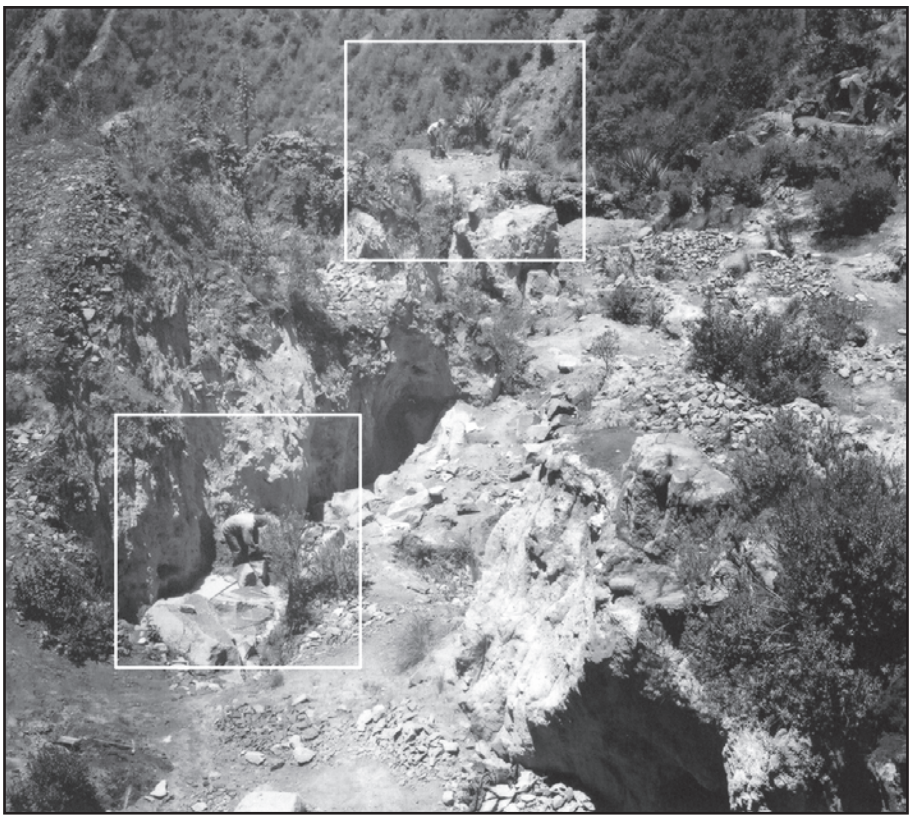


Figure 4.4. Work area platforms, Nahualá, Guatemala.

are thrown down forming talus slopes that surround the work area (Figure 4.5). Work areas at these quarries are clearly visible because of the features described above and average between two and three meters in height.

When the metate blank is moved to an appropriate work area, metateros begin removing large pieces of stone using metal picks that have both pointed and flat ends (Figure 4.6). A large pick is used to take off large pieces of stone and smaller ones are used for working more detailed areas, like around the legs of the metate. Mario Gonzalez said they always begin by forming the grinding surface first because it is the most important part. He said they then form the sides of the metate and finish with forming the legs (Figure 4.7).

Just as with the metateros reported in Oaxaca and Malacatancito (Cook 1982; Hayden 1987), the metateros of Nahualá and Jilotepeque roughly finish their metate preforms at the quarry and then transport them to their home workshops where they finish

Figure 4.5. Debitage on the slope of a platform work area in Nahualá.

Figure 4.6. Chisels used by metateros during the roughing-out of manos and metates in the quarries.

Figure 4.7. Francisco Ajtzalam of Nahualá forms the legs of a metate.

them. The norm for metateros at both quarries was one roughly formed metate and mano produced per day.

I visited one home workshop of a Nahualá metatero, Jacinto Guachiac Sohom (see map, Figure 3.9). Finishing the surface of the grinding stone involved using a flat-ended pick to strike the stone in a swing that is perpendicular to the stone surface (Figure 4.8). This usually resulted in the crushing and flattening of any elevated areas on the surface with the flat side of the pick. Only small pieces of basalt (about 1-5 cm wide) and powdery debitage resulted from this process of reduction (Figure 4.9). I noticed that this debitage may not be significant enough to later recognize the area as a home workshop. Most of what resulted from Jacinto's work was a very fine powder. Jacinto informed me that the little debitage that did accumulate around his work area on his porch would be swept up and discarded somewhere around the home. This was also reported by Margaret Nelson (1987b:134) about home workshops in Malacatancito, Guatemala.

Figure 4.8. Chisels used by Jacinto Guachiac Sohom during the finishing of manos and metates.

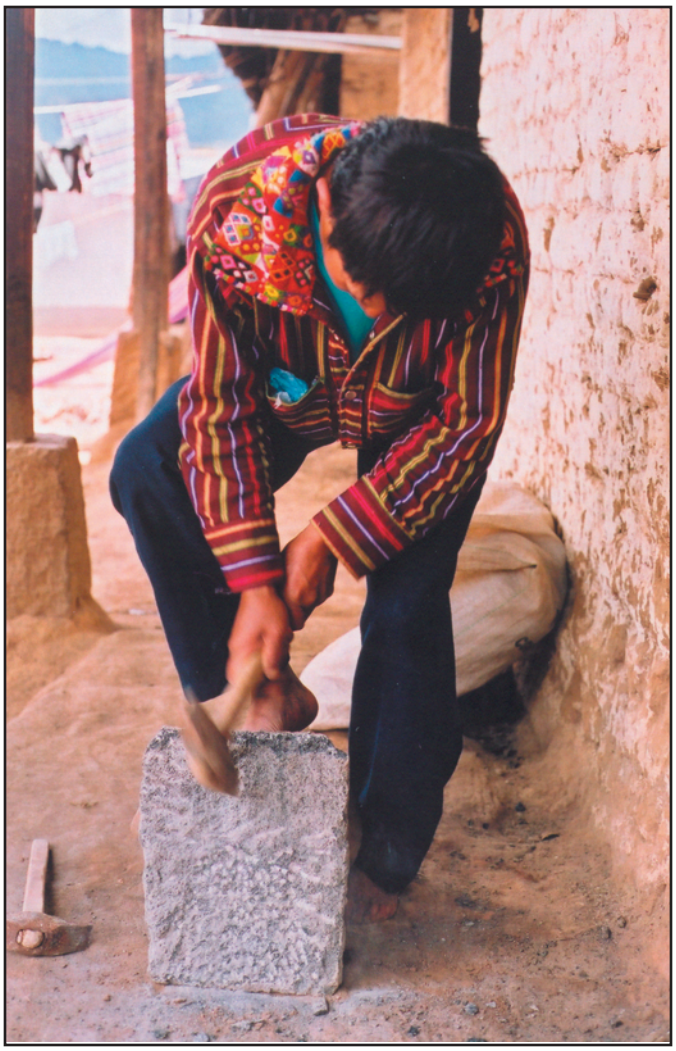


Figure 4.9. Jacinto Guachiac Sohom of Nahualá finishes the grinding surface of a metate at his home workshop. Notice the small size and amount of debitage on the ground.

The Metatero's Work Week

The work week of the metateros, as explained by Francisco Ajtzalam of Nahualá, is six days long. Three days are dedicated to working in the fields tending their corn and other crops. Three days are spent producing manos and metates, and Sunday is their day of rest. Francisco mentioned that there was no particular order in which they would work at the quarries making grinding stones or work in their fields. Sunday is also when they take their finished grinding stones to the market to sell. This venue is described later.

Cook (1982) also reported that metateros of Oaxaca did not dedicate all of their time to producing manos and metates. Most Zapotec metateros worked only part-time in the quarries and supplemented their income by working construction. When a building project was completed, they would return to making and selling grinding stones. Most of the metateros I interviewed have plots of land where they grow maize. Energy and time is divided between maintaining their maize crop and making metates.

Stone Selection

When choosing stone to make a mano or metate, there are preferences that have to be factored into the decision. These include vesicle density, stone color, and flaws. Each one of these will be briefly discussed.

Vesicular basalt (Figure 4.10), a type of stone formed from molten lava, is exploited by the metateros of Nahualá and Jilotepeque. It is an extremely porous rock. The vesicles in this type of basalt are caused by gas bubbles that were in the magma during cooling and solidification (Dietrich 1989:47; Pirsson 1966:129). The density,

Figure 4.10. Vesicular basalt from the quarries of San Luis Jilotepeque, Guatemala.

Figure 4.11. Illustration of the relationship between vesicle density and the difficulty in working vesicular basalt (derived from Hayden 1987b:15).

amount, and size of vesicles are very important to metateros.

Hayden (1987b:15) wrote a detailed description on the four levels of vesicular density of basalt from Malacatancito. This scale of variability is illustrated in Figure 4.11. It shows that when the stone has more vesicles, it is easier to work. The less dense the vesicles, the harder the stone. Mario from Jilotepeque showed me that it is important to find stone with the right balance of vesicles and workability. The basalt in Figure 4.10 is a piece from the metate he was working on at the time of my interview (see DVD chapter "Jilotepeque metateros"). Mario emphasized that this was very good stone with the right number of *hoyitos* ("little holes" or vesicles).

Another indicator of good stone is its color association. Among the Q'eqchi' and Pokomam, I was not told much about the difference in quality when it came to the color of stone used to make manos and metates of the Eastern style. In contrast the K'iche' had distinct preferences that guided the choice of stone for of Western style grinding stones.

At first I assumed colors assigned to different kinds of rock were literal descriptions of the rock's color. Manuel Rosario, one of the metateros in Nahualá, helped me to understand that these names are somewhat arbitrary and did not refer to the actual color. In K'iche', the term *rax abaj* literally means "green/blue stone." Manuel said this

is the best type of stone because "se aguanta" ("it lasts a long time"). I also referred to a K'iche' dictionary (Universidad Rafael Landivar 1991) that listed alternative definitions for the word *rax*. Just as in English, the word "green" can mean "unripe" or "raw." In a Colonial dictionary, the words *rax abaj* are defined as "volcanic rock" (Thomas de Coto 1983:193).

The other type of stone mentioned during research among the K'iche' was *sak abaj*, or "white stone." This was identified as a poor material for making manos and metates. Some even described it as being "pure dirt," indicating that it was not hard enough to sustain grinding. The metateros at the Nahualá quarries verified that *sak abaj* was very poor stone to use for manufacturing grinding stones because people do not buy manos and metates made out of "white stone." I noticed that *sak abaj* did appear to be white in color, but stone identified as *rax abaj* did not look green or blue. Usually *rax abaj* was a dark grey to almost black basalt.

Hayden (1987b:14) also discovered a color difference in stone preference among those of Malacatancito. "Black stone" was preferred because it had fewer vesicles and lasted longer. "White stone" was of poorer quality (i.e., stone with a large amount of white mineral inclusions) and left rock particles in foods that were ground on metates of this type (Hayden 1987b:14).

Another important quality of the basalt used by the metateros was that it contained no flaws. Flaws can be stress fractures that occurred during the extraction process. Large inclusions in the unworked stone, such as quartzite, can make it weak. If inclusions are not detected, the preform could break in the wrong place during the roughing out or finishing stages, rendering the mano or metate preform useless. Metateros are very careful to choose stone according to the guidelines mentioned above. If they do not take these factors into consideration, the time expended for the production of a mano and metate may well be lost if the metate breaks while being worked.

Measuring and Standardization

At both quarries I observed metateros using different methods to measure the size of the features that were to be cut out of metates. Most used their fingers as a guide. For example, the length from the tip of the index finger to the tip of the thumb, both fully extended, was used by Antonio Sohom Tzep. (I estimated the span from index finger to thumb to be approximately 15–17 cm.) He used two of these finger spans, about 32 cm, to determine the width of the dorsal grinding surface of a metate in Nahualá (Figure 4.12). Antonio, as well as others at this quarry, also used fibers from yucca plants that grow around the quarry to make measurements. Mario, the metatero from Jilotepeque, uses a cut piece of a broom stick to measure his metates. After width is determined, the stick is placed diagonally across the grinding surface, from corner to corner, to determine the length of the metate (see DVD chapter, "Jilotepeque Metateros").

Hayden (1987a:187) says that "commercially produced manos and metates tend to

Figure 4.12. Antonio Sohom Tzep using his fingers to determine the size of a metate.

exhibit relatively little variation in proportions or major morphological features, probably for the same reasons that standardization occurs in specialized ceramic production." In other words, size and shape may correlate to function.

Mentioned in Chapter 3 was Horsfall's suggestion that the size of metates may determine the types of materials ground on them. In her study, she determined that there was a positive correlation between the surface area of grinding stones and function (Horsfall 1987:351). An analysis of the correlation between metate size and function of the grinding stones in my study appears in Chapter 5.

Patrilineal Line of Stoneworkers

Of the seven metateros I interviewed during both field seasons, all of them were taught to carve stone by their fathers. This teaching process usually begins with a young boy accompanying his father to the quarries on Saturday to observe and help in the manufacture of a mano and metate. The boy may start with making manos and eventually move on to producing metates. I was told that many mano and metate blanks and preforms are broken or ruined before a young boy learns how to properly finish a grinding stone. In addition, many of their first attempts in sculpting a mano or metate results in awkward shaping or flaws. These metates can still be sold in the market, but usually retrieve a lower price.

Mario of Jilotepeque said that young boys are ten years old when they are taught how to sculpt stone. When I met him in the Jilotepeque quarries, he was working along side his son, René Gonzalez, who has made metates now for nine years. Antonio Sohom Tzep (Nahualá metatero) also learned when he was 10 years old from his father. I interviewed Antonio in the 2003 field season, and upon returning one year later to the same spot in the quarry, I met his father, Manuel Guachiac Guachiac (Figure 4.13).

When Manuel Rosario of Nahualá was twelve years old, he learned how to make

Figure 4.13. Manuel Guachiac Guachiac, taught his son to make manos and metates in the quarries of Nahualá. Now his son, Antonio Sohom, is teaching his boys the same skills.

grinding stones from his father. Manuel Ramirez Guachiac, also a metatero of Nahualá, says he was teaching two of his sons how to be metateros at the time of the interview. The passing down of the metate manufacturing tradition through patrilineal lines was also briefly documented by Cook (1982:159).

Sale and Distribution

Chapter 2 described the detailed market system for manos and metates among the Oaxacan metateros (Cook 1982). Many aspects of the sale and distribution of grinding stones among the Nahaulá and Jilotepeque metateros mirror those reported in Cook's study. For example, metateros from my research area predominantly sell their products in local markets. They also sell to local end buyers, who will use the tools in their own

homes or sell them to distributors who sell the metates in other towns at marked-up prices.

Selling to End-Users

One block away from the center plaza of Nahualá's market, the metateros bring their newly sculpted manos and metates to sell mostly to people who will take the stones to their homes for use (Figure 4.14). Along this street, prices are negotiated over metates and manos. Some metateros bring more manos than metates because there is a greater need for manos. Manos usually break more often due to dropping or some other type of incident. These can be easily replaced by a mano purchased at the market (Figure 4.15).

Coban is an example of a market where manos and metates are supplied by a middle-man or distributor. The grinding stones there are purchased by retailers who then sell them from their stalls in the central market to end-users (Figure 4.16). In the next

Figure 4.14. Metateros bring their finished grinding stones to this street in Nahualá on market days to sell to end buyers and distributors.

Figure 4.15. Manos for sale at the Nahualá market.

Figure 4.16. Manos and metates for sale at a stall in the central market of Coban, Alta Verapaz.

section I describe the role of a major distributor/wholesaler who sells grinding stones to areas all over Northeastern Guatemala.

Wholesalers/ Distributors

Don Luciano Tun is a Q'eqchi' man who lives in Chamelco, Alta Verapaz (Figure 3.1). He is a distributor of the Eastern style metate that is produced by metateros of San Luis Jilotepeque. Twenty years ago, Don Luciano noticed that there were no grinding stones in the markets of Alta Verapaz, so he worked to build a business to buy manos and metates from producers in Jilotepeque and resell them to various retailers. He regularly travels to pick up grinding stones in Jilotepeque and usually goes to manufacturers' homes to do so.

Typically, Don Luciano waits for orders to be placed by retailers and then makes the delivery. Because he has no vehicle of his own, he contracts with different *flete* (transport business) owners who usually have a pick-up truck for transporting goods. Don Luciano sells manos and metates to places such as Coban, Tucuru, Tactic, San Cristobal, Santa Cruz, Chiaan, Lanquin, Cahabon, Chisec, Bartolome de Las Casas, and Senahú, all of which are located in the department of Alta Verapaz. He also distributes to the departments of Baja Verapaz and Izabal (Figure 4.17).

Don Luciano makes his profit by buying manos and metates at a low price and then selling them at a higher price to retailers. Table 4.1 shows the percentage of mark-up for the different sizes of metates he buys and distributes.

Distribution used to be the task of metateros from Jilotepeque, who would carry two to three mano and metate sets at a time using only a *mecapal* (tumpline). According to Don Luciano, these men would walk carrying the grinding stones for three days, one way. He knew ten different men that used to make this trip to sell their metates in areas of Alta Verapaz. The use of a *mecapal* dates to prehispanic times and was most likely the

Figure 4.17. Map of Don Luciano Tun's area of distribution for manos and metates.

Table 4.1. Prices for manos and metates according to size and person buying them. Includes the percentage of mark-up that is implemented by Don Luciano Tun. Prices are in quetzales.

Metate size	Distributor Price	Wholesale Price	Mark-up %
Large	75Q	125Q	67%
Medium	60Q	80Q	33%
Small/souvenir	—	—	—
Mano (all sizes)	10Q	20Q	50%

Notes: Distributor price = Don Luciano Tun's buying price; Wholesale price = retailer's buying price. (The exchange rate at the time this data was recorded in May 2003 was 7.8Q = $1.00 US, 30Q = 1 day labor)

principal method for the transport of goods at that time.

McBryde (1945:73) found metateros from Nahualá selling manos and metates by going house to house. He said "Nahualá men take usually 2 metates and 6 *manos* (handstones) at a time, a load of about 100 pounds. During July and August 1936 I saw six or eight of them daily going to Quetzaltenango" (McBryde 1945:73). The trip to Quetzaltenango is about 25-35 kilometers one way, and the metateros probably walked more than one day to arrive at their destination.

Summary

Whether the modern metate market significantly resembles an ancient one is left to conjecture. Modern motorized transportation and animals that could carry loads were not always available. But given the information on distribution from Don Luciano and McBryde, there is a better analogy of how metates and manos were likely transported long distances.

One of the most interesting aspects of the metate market is that these tools are still in demand. The K'iche' do not use grinding stones as much as do the Q'eqchi', but they continue to purchase them. The metatero from Nahualá, Manuel Ramirez, said that he has no problems selling the metates he takes to the market every week. I think the main reason why a strong demand continues for these tools is that the tradition of giving a mano and metate set to a newlywed couple who have moved from their parents' home is still practiced among both the K'iche' and Q'eqchi'. This custom is described below.

Gifting

Manos and metates are often given as wedding or "house-warming" gifts. They are given to newly married couples who move from their parent's homes to their own. This tradition of giving manos and metates to newlyweds was also documented by Cook

(1982:90) for Oaxacan communities.

Gifting adds an important characteristic to the life histories of manos and metates among the Highland Maya. When grinding stones are given to children leaving the home to live with their spouses, many times the parents will give the couple a grinding stone that has been used for many generations. In some cases, the metates *and* manos have been passed down through three generations. Some were reported to have been passed down from their great-grandparents (Figure 4.18). These were roughly estimated to be about 100 years old by the informants. Of the Eastern style, grinding stones purported to be multigenerational and approximately 100 years old normally have a mano that is very thin and the metate trough is very deep (Figure 4.18). Western style metates of this age have a grinding basin that is very thin just above the distal legs and an accompanying mano that has a "dog-bone" shape (Figure 4.19).

The surveys of manos and metates conducted in my research included the

Figure 4.18. An Eastern style metate from Pantoc, Alta Verapaz, Guatemala, estimated to be 100-150 years old. It was passed down and used by three generations of women.

Figure 4.19. Example of a Western style mano that exhibits a "dog-bone" shape due to the abrasion against the metate over many years of use.

collection of this giver-receiver information, which was recorded on 166 of the 168 metates studied. Of the 166 metates, 73 were handed down from one generation to another (Table 4.2). 42 percent (N=30) of these metates were passed from mother to daughter (Figure 4.20). I recorded 14 cases where fathers passed metates to their daughters. The remaining instances of gifting were either passed from both parents to daughters, parents to sons, or grandparents to granddaughters. Overall, 86 percent

Table 4.2. Givers and receivers of 73 metates.

Giver	Receiver: daughter/ granddaughter	Receiver: son
mother	30	5
father	14	4
parents	6	1
grandmother	6	0
grandparents	7	0
TOTALS	63	10

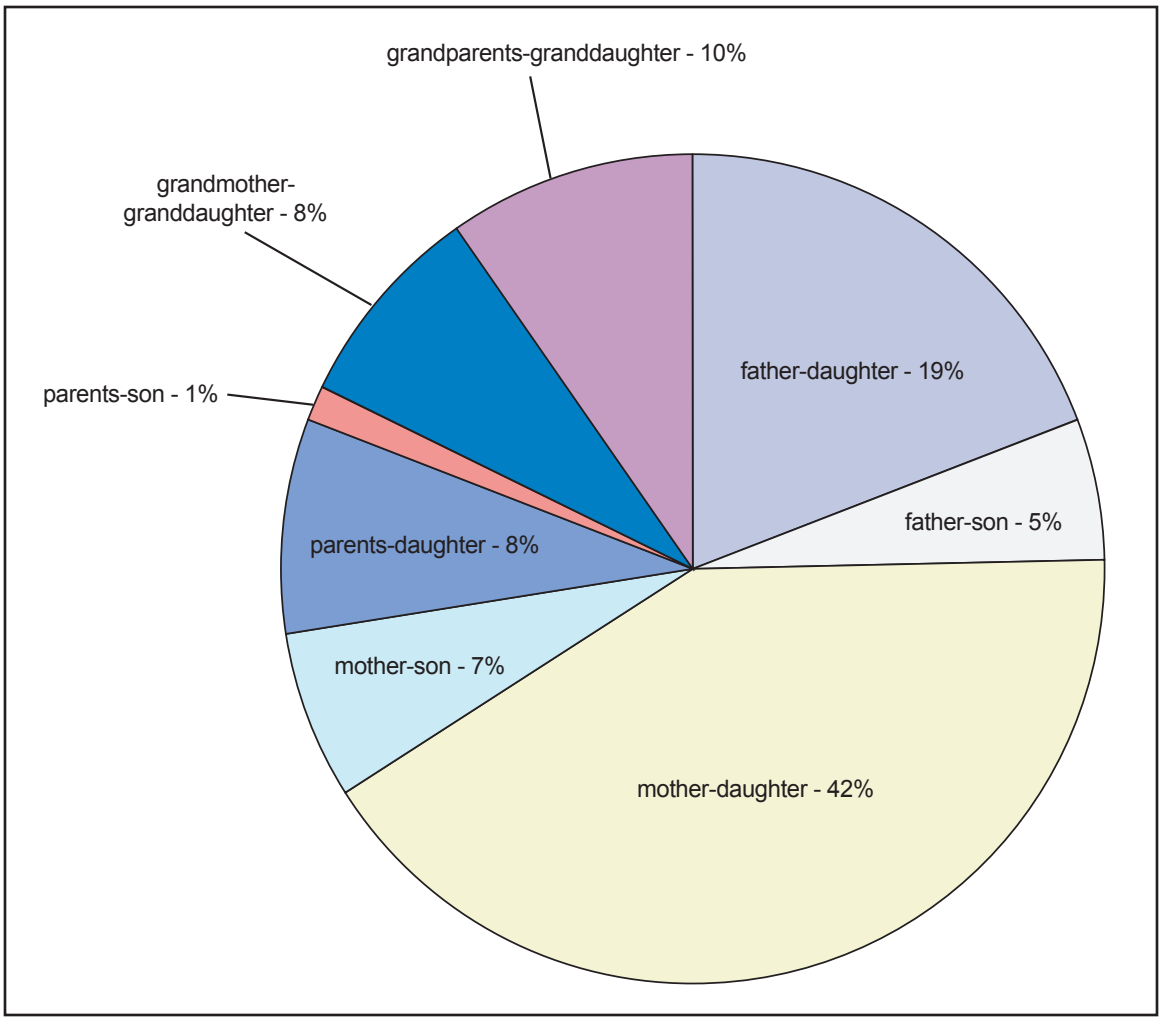


Figure 4.20. Percentage of lines of descent for manos and metates that are gifted.

of gifting ended with someone (either grandparent or parent) giving a daughter or granddaughter a mano and metate.

To clarify the tradition of metate gifting, I asked Rosa Ca'al, a Q'eqchi' woman from Pantoc, to explain. She said that it is customary for the young man to move in with the woman's family after marriage, if the new couple does not have enough money to build their own house. Later, when they move from the parents' home, the wife's parents traditionally give them a metate, which can be old or a newly purchased metate, but this is not practiced by all Q'eqchi'. In some cases, the new wife goes to live with the husband's family and his parents give a metate to the couple when they move out. There

are also times when the parents do not have money to buy the couple a metate nor do they have an extra to give them. In this case, the new couple has to buy one for themselves.

Use

The women that continue to use manos and metates today arise early in the morning to grind corn and prepare tortillas for the day's meals. The work is arduous and long. Some older women suffer from rheumatic shoulder pains, which are most likely caused by the physical demands of grinding (Foster 1979:52).

Metal hand grinders (Figure 4.21) may have appeared around the beginning decades of the 20th century and were used for a very rough grind. A few decades later, gas propelled motors (Figure 4.22), which drive large industrial grinders, were introduced and could grind maize in seconds, a process that would normally take a woman most of the morning. Gasoline propelled motors were followed by electric grinders. But before the introduction of motorized or electric grinding mills and hand grinders into much of Mexico and Guatemala, maize was processed solely on metates. Given the importance of maize consumption and preparation in ancient Mesoamerican culture, it is evident that the task of grinding corn for meals was (and still is in many cases) an indispensable and labor-intensive routine.

Frequency of Use

Between the Q'eqchi' and K'iche' there were distinct differences in the frequency of use of manos and metates. In the communities of Pantoc and Chicojl, the two Q'eqchi' communities, every woman used her metate daily. All but two Q'eqchi' women performed the third/fine grind to prepare tortillas before all three meals. Only one of the K'iche' women, Dominga Chibalan Sac (IXT-05), said that she used her metate three times a day. She grinds masa that has been processed initially at the molino one final time

Figure 4.21. Ofelia Ca'al using a hand-grinder for the initial processing of corn before it is passed over to the metate.

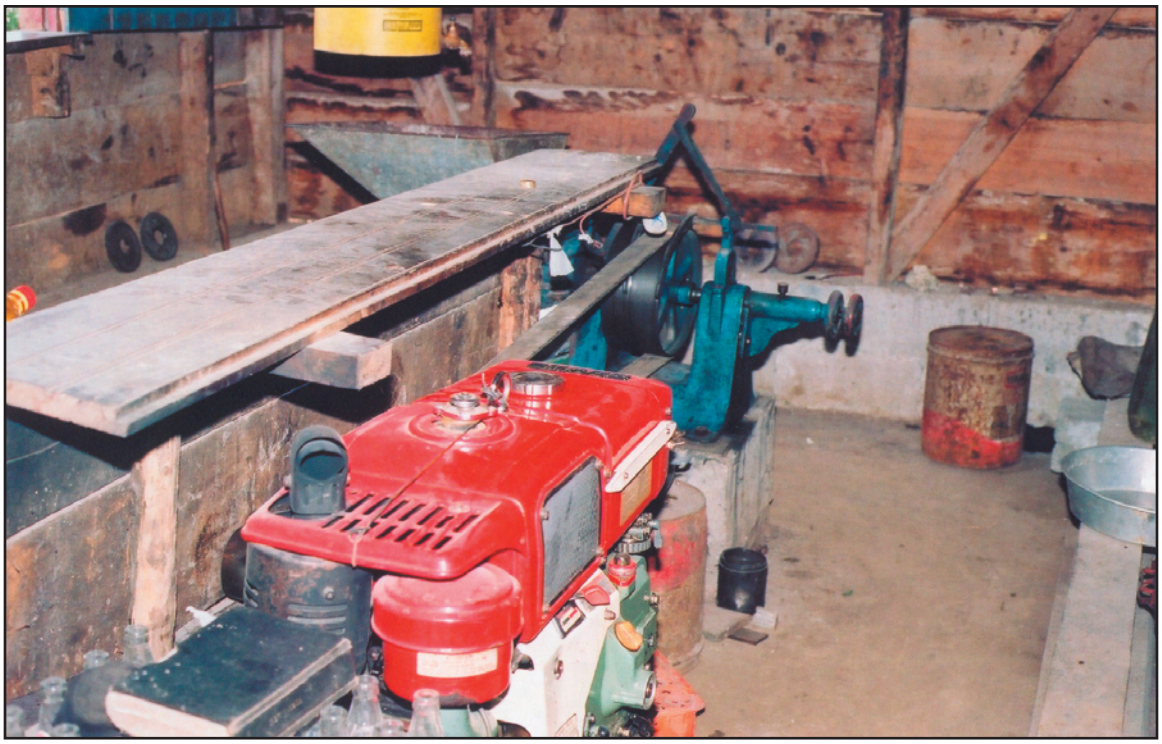


Figure 4.22. Gas-driven grinding mill in Chicojl.

as most Q'eqchi' women do. When preparing tortillas, the texture of the masa has to be a specific consistency in order for the tortillas to be formed correctly. Masa that contains chunks of maize is said by the Q'eqchi' to be too *k'es*, or "sharp." Masa that is *k'es* falls apart during the patting out of tortillas and has to be ground again before a suitable tortilla can be made.

Figure 4.23 shows the frequency of use of manos and metates among the Q'eqchi' and K'iche'. "Rarely" indicates that a woman may use her grinding stone anywhere from once every other week to almost never. "Weekly" equals one time a week to three times a week, but not daily. "Daily" is one to two times a day, but not three times a day. Most of the informants were Q'eqchi'. Figure 4.23 helps to show that the Q'eqchi' prefer their masa ground very fine and that they are more actively using their manos and metates. It also shows that those in communities with fewer facilities (major transportation, electricity, running water, molinos) tend to use their manos and metates more often. These conditions for each community were described in Chapter 3.

The majority of the K'iche' in Ixtahuacán only occasionally use their grinding stones. Most are satisfied with the consistency of the masa that the community molinos produce, but others say that if the molino does not grind the nixtamal well, they will give the masa a fine grind on the metate before making tortillas. Many said that the reason they feel manos and metates are important is because if the electricity goes out in the town (rendering the molino inoperable), they have something on which to grind their nixtamal. In addition, K'iche' women use metates for making *jo'co'm*, which is a sauce made by grinding together chiles, achiote, masa, and tomatoes. Other uses for metates among the K'iche' and Q'eqchi' are to grind coffee, old tamales and tortillas (as fodder for animals), and other foods such as achiote, cacao, beans, chile, cinnamon, garlic, and onions.

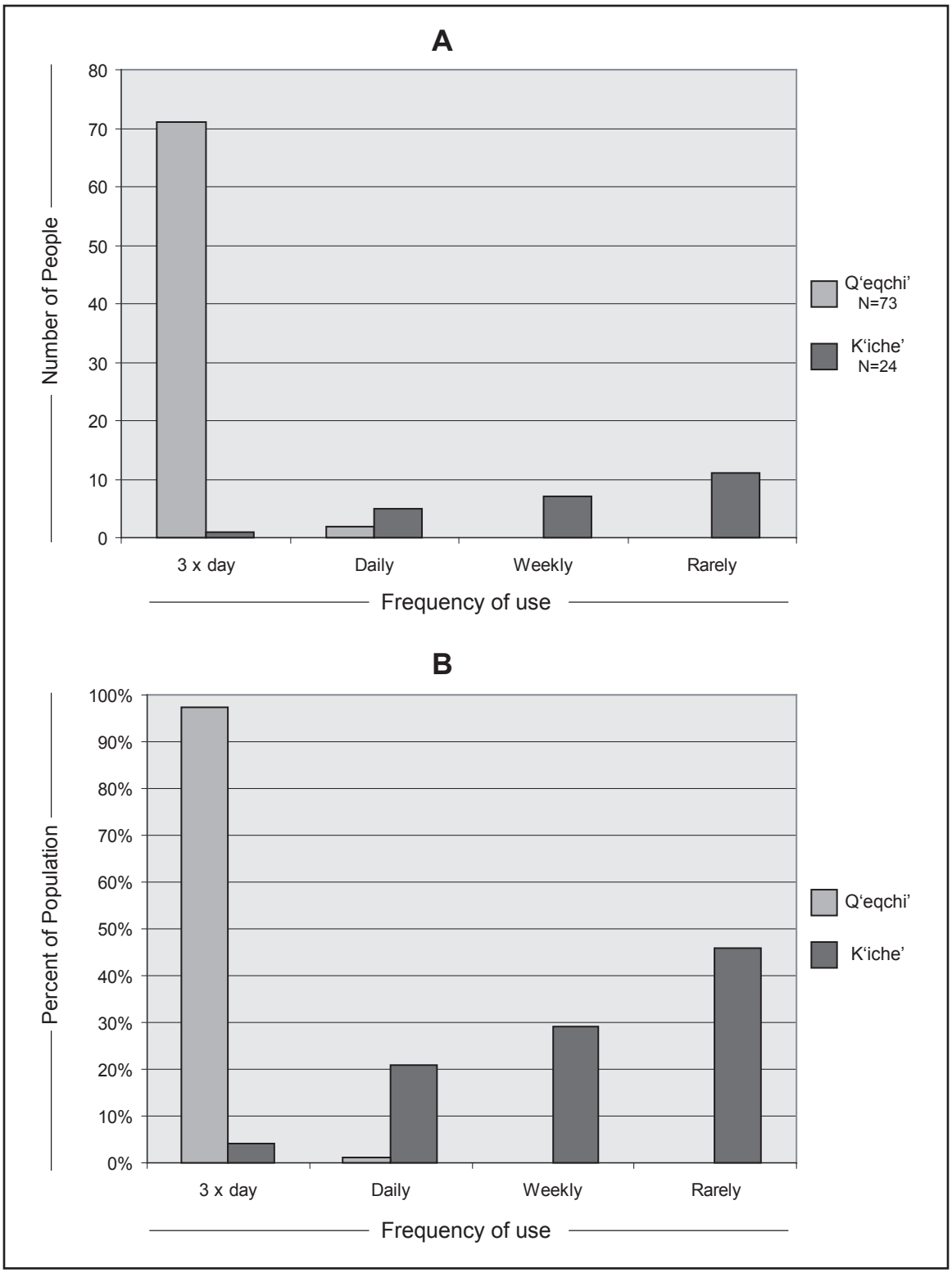


Figure 4.23. Frequency of mano and metate use among the Q'eqchi' and K'iche'; (*a*) shows the actual number of people and (*b*) shows the percent of the Q'eqchi' or K'iche' population.

Taboos Associated with Manos and Metates

An interesting aspect of the study of modern manos and metates is the taboos related to their use. I initially learned about these taboos and rules governing the use of grinding stones when I spoke with people during my preliminary visit to Guatemala in 2003.

A word used by the Q'eqchi' to describe an action that results in either sickness or harm is called *awas* (Wilson 1995:125). This is similar to the Western idea of bad luck. For example, if someone were to walk under a ladder, it would result in something bad happening to that person. Most *awas* have a consequence for an action that is considered taboo. There are also many *awas* situations associated with manos and metates that have corresponding consequences.

Not all of the *awas* described by those who participated in the survey were consistent with the descriptions of others. Below, I describe each one of the *awas* associated with manos and metates, their variations, and the corresponding language group to which the *awas* is associated. An abbreviated version of this information is contained in Table 4.3.

Twilight Awas

One should not take their metate out under the stars (or moon) or it will break. Another variation to this is that a pregnant woman should not take a metate outside under the stars or her child will be born with its eyes crossed. This was mentioned a number of times among the Q'eqchi', and one K'iche' person believed it as well.

Ocote Awas

If the burning end of an *ocote* stick breaks, the mano of their metate would break soon after. A variation to this taboo was if a person were to break a piece of *ocote* over

Table 4.3. Abreviated *awas* data of the Q'eqchi' and K'iche'.

Awas	Prohibited Action	Consequences	Q'eqchi'/ K'iche'
Twilight	Do not take metate out under the light of the stars (or moon).	Mano or metate will break.	Q'eqchi' and K'iche'
Ocote	Do not break the burning end of an ocote stick.	Mano will break.	K'iche'
Measuring	Do not measure (or compare) manos or metates.	Mano or metate will break.	K'iche'
Male-contact	Men can not touch the metate after a woman has ground on it.	The man will only produce female offspring.	K'iche'
Metate leg	Do not sit on proximal leg of metate while it is resting against the wall.	The man will only produce female offspring and females will only produce male offspring.	K'iche'
Walking over metate	Do not walk over a metate while it is on the ground.	The man will only produce female offspring and females will only produce male offspring.	K'iche'
Grinding while pregnant	Grinding prohibited for pregnant females.	Newborn baby will be born with an illness.	Q'eqchi' and K'iche'
Eating while grinding	Do not eat while grinding on a metate.	Food from mouth will fall in the masa; woman will cut her hand grinding; woman may choke; she will not make as many tortillas and the masa will not last.	Q'eqchi'

their leg, their mano would soon break. Before there were candles or kerosene bottle lamps, people used sticks of *ocote* (pieces of pine tree wood [pitch pine torch] saturated with resin that cause it to burn for a long period of time). The K'iche reported the belief of the *ocote awas.*

Measuring Awas

If a metate is measured or compared to another metate, the metate can break. This

also applies to manos. The "measuring *awas*" probably caused the most problems with recording the sizes of many metates and manos. I found that many (K'iche') believe that making comparisons of things is an *awas*. Measuring is a form of comparison, and the consequence for doing so is that the metate or mano will break soon after. I was told that this same consequence can occur with things like machetes (Diego Telesfoto, personal communication 2004). If a person measures or compares his machete to another machete, he runs the risk of his machete breaking. Again, this applies to almost anything, so when it was time to measure the manos or metates at an informant's house who held this belief, they were sure to tell me. They did not want me to curse the stone and have it break.

Male-contact Awas

Men who touch a metate, after it has been used for grinding by a woman, will only produce female offspring. This was a belief among the K'iche'. There is a distinct dichotomy in labor roles between men and women among both the Q'eqchi' and K'iche'. Whenever I asked whether men could grind on the metate, informants almost unanimously responded with a "No" and a giggle, as if it were an absurd question. Many women responded saying, "Men have their tools; machetes, hoes, etc. We have our tools; metates, pots, etc." I was also told that "the woman's work is in the home, while the man's work is in the field. That is *his* work" (Elvira Ma'as, personal communication 2004).

The K'iche' feel that it is an *awas* for men to touch or use a metate. I was told that after a woman had ground corn on a metate for the first time, men should not touch it. It would show *no respeto* (no respect) to the stone. At this point in my research, I began to realize that the homes I had visited had both women and men present, but the women would always handle the metate, even though a man might be there to help. Pascual

Tambriz claimed that he had never touched a metate his whole lifetime. He had to think about it, but assured me that he had never touched one.

This made me wonder a little more about the *awas*. The Q'eqchi' informed me that it was acceptable if a man ground corn while the wife was sick or in need of urgent help. But, the K'iche' would find a *mos* (female servant) to do the work before a man would touch the metate.

Even though men make the metates, sell them in the market, and may even carry them home, after they have been used by the woman, a man should not touch them out of respect for the stone and the woman. I asked what would happen if a man *did* touch a metate that had already been used to grind corn by a woman. Manuela Tambriz was the first to tell me that I would be cursed with only having female children. I also asked Manuela's son, Pascual, why having only female offspring would be considered a curse, and he responded, "cuesta mantenerlas"– "It is hard to take care of them." I interpreted this to mean that without boys, there would be no help in the fields, gathering wood, cleaning the milpa, harvesting, and working to earn money for the family's needs.

Metate Leg Awas

If a boy sits on the proximal leg of a metate while the metate was resting against the wall (Figure 4.24), the boy would only be able to produce female offspring. The same is true for girls who sit on the leg, except that they would only produce male offspring. These consequences are the same as the "male-contact *awas,*" but they also apply to women.

Walking Over Metate Awas

There is another gender-specific *awas* of stepping over the metate when it is on the floor. I was told that it did not matter if it was a girl or boy that stepped over it, but

Figure 4.24. It is *awas* for children to sit on the proximal leg of the metate when it is in a resting position on the wall.

that the curse would still apply, always affecting the person who committed the sin ("puro pecado" (pure sin) as one lady put it) by cursing them with only girls for children (if a man) and only boys (if a woman).

Grinding While Pregnant Awas

If a woman is pregnant and grinds on her metate, her baby could be born with an illness. The variation of this *awas* is if a woman does not clean her metate after it has been used, her child could also be born with illnesses. I was told that one of the illnesses that could result from this type of action was that the soft spot on the head of the newborn would appear as masa. Also, they could be born with sores on their throats. If that were the case, Rosa Ca'al of Pantoc said that it could be cured by rubbing the mano on the sores for ten days.

Eating While Grinding Awas

If a woman eats while grinding on a metate, she can cause harm to her children. Most people agreed that eating while grinding on a metate was not good. Some said it

was *awas*. There were varied consequences of such an action. Some people reported that their children could get sick. Carmen Estel Cho Chup indicated that the sickness children can receive from this *awas* is a burning of the eyes, as if there is chile in them. Rosa Ca'al said that eating while grinding would cause the person's children to have diarrhea.

There are a few variations to the consequences of this *awas* as well. First, some said that if a pregnant woman eats while using a metate that her unborn child would be born with an illness. For example, the baby could be born with cuts/slits on its throat and in the cuts is white, milky puss. To cure it, the mother must take the water that is used to clean the masa off the metate and rub it on the baby's cuts. Second, some of the consequences were as simple as food from the woman's mouth could fall into the masa she is grinding and contaminate the food, or the woman might choke. Another consequence of eating over the metate is that a person would cut their hand while grinding. Last, if a woman eats while grinding or making tortillas, her tortillas "*no renderá*" (they won't last).

Grinding-Time Analysis

The purpose of this section is to analyze the existing ethnographic accounts of the time it took women to prepare maize on metates. I will compare these times to four others recorded in my 2004 field season among the Q'eqchi' and K'iche'. This study provided an opportunity to view the behavior associated with grinding maize and to determine an average amount of time that women spent grinding each day.

Factors Determining Grinding Time

Variation in the amount of time women spent grinding corn each day can be caused by a number of factors. These include, but are not limited to, stone composition, metate style, and the individual operating the metate. Because there is no indication

of composition or style in the ethnographic records, it is hard to determine the style of metate used or the type of stone of which the metates were made. In this section, I will highlight the different styles and types of metates that may have been used by Mesoamerican women, using information from my work in Guatemala as well as other literature on grinding stones.

Type of Stone

Metates can be made of several types of stone that all have specific characteristics. Basalt, especially vesicular basalt, is among the most common of modern grinding stones (Figure 4.10). Other types of common prehispanic materials include granite, rhyolite, andesite, quartzite, sandstone (which is common in the American Southwest), and limestone. Naturally, softer stones such as limestone and sandstone would not be the most desirable material on which to grind because stone particles would contaminate the food being milled.

The most common, and most desirable quarried stone for the purpose of making metates is vesicular basalt. Michael Smith (2003:102) wrote that basalt metates were made in and distributed from the Otumba city-state region among the Aztecs in the Valley of Mexico. Also, analysis of vesicular basalt provides evidence that it produces metates with the longest use lives (Nelson and Lippmeier 1993:294-295).

Mary Spinks (1984) researched metates located in prehistoric houses of Copan, Honduras. She found that 68.2 percent of all footed metates found were made of basalt. Her ethnographic investigations showed that "rougher stone is good for breaking maize kernels. A vesicular rock would be constantly rough. New pores would be opened as old ones were worn away" (Spinks 1984). This information was echoed by Hayden's (1987b:14) informants, reporting that vesicular basalt grinding stones resharpen themselves and do not need resharpening as often as those made of granular andesite.

Jenny Adams (2002) conducted experimental work upon metate types similar to those found in the archaeology of the American Southwest. Although not directly associated with Mesoamerica, this information is a valuable analog for understanding the essential efficacy and function of metates worldwide. Adams (2002:69) found that vesicular material provided a better surface on which to grind seeds and dried kernels because it did not add particles of rock to the flour. Although metates of other types of material and surface texture exist, those of vesicular basalt are preferred and make up a large portion of those produced and used in Mesoamerica today.

Style of Metate

Another aspect of Adams's experimental work looked at the efficiency of different types of metates. Again, she used styles based on those found in the American Southwest, which include basin, flat/concave, and trough metates. These types closely relate to those found in Mesoamerica, although the terminology and taxonomy used by Clark (1988:94-95) to describe them is different.

Adams (2002:68,106) showed that trough metates, those with "intentionally manufactured rectangular basins or troughs," could grind more dry grain per unit of time than the flat/concave type of metate. ("Trough" metates as described by Adams [2002:106] are the same style as Clark's [1988:95] "restricted" metate, and Adams's "flat/concave" metates are similar to the "unrestricted" metates of Clark's taxonomy). Adams (2002:68-69) also demonstrated that the flat/concave and trough metates were "equally efficient" when tested in processing soaked kernels, which is the most common type of maize grinding performed among those of Mesoamerica.

Looking at a number of cross-cultural studies on the relationship of increased agricultural dependence and mano size, Michael Diehl (1996:106) found that manos with a larger surface area could process more grain than smaller manos. Diehl (1996:106)

concluded that "larger manos are more efficient than small manos, and flat-bottomed (trough and slab type) metates are more efficient than basin-bottomed metates for grinding large amounts of corn."

The Individual Grinding

During Adams's (2002:68) ethnographic work on grinding among the Hopi, she was informed that "a novice grinder may grind differently than an experienced one." She explains that this variable was not considered in her experimental work on metates, but that it is an important one to consider; she performed all the grinding in her experiments. Essentially, someone with more experience will grind more efficiently than one who is just beginning to learn how to grind on a metate. For example, Adams (2002:68) says, "Hopi women who have ground food all their lives emphasize using rhythmic strokes and using the whole body, not just the arms."

Barry Isaac (1986:16) points out that because grinding maize requires a great amount of arm strength, preadolescent girls would not contribute significantly to the daily grinding process. One would assume that they would have to be able to endure a long period of constant, rigorous motion in order to efficiently prepare maize for those within the household.

The Codex Mendoza, a post-conquest Aztec manuscript, records information dealing with the instruction mothers would give to their daughters on how to grind with a metate. Figure 4.25 shows a mother with a speech scroll coming from her mouth, indicating that she is talking to or educating her daughter about grinding maize and preparing tortillas. The accompanying text indicates that the girl is 13 years old. Considering that this girl is essentially "in training," she would still be learning to grind maize as instructed by her mother. This strengthens Isaac's claim that preadolescent girls may not have had the experience or strength to perform this laborious task efficiently.

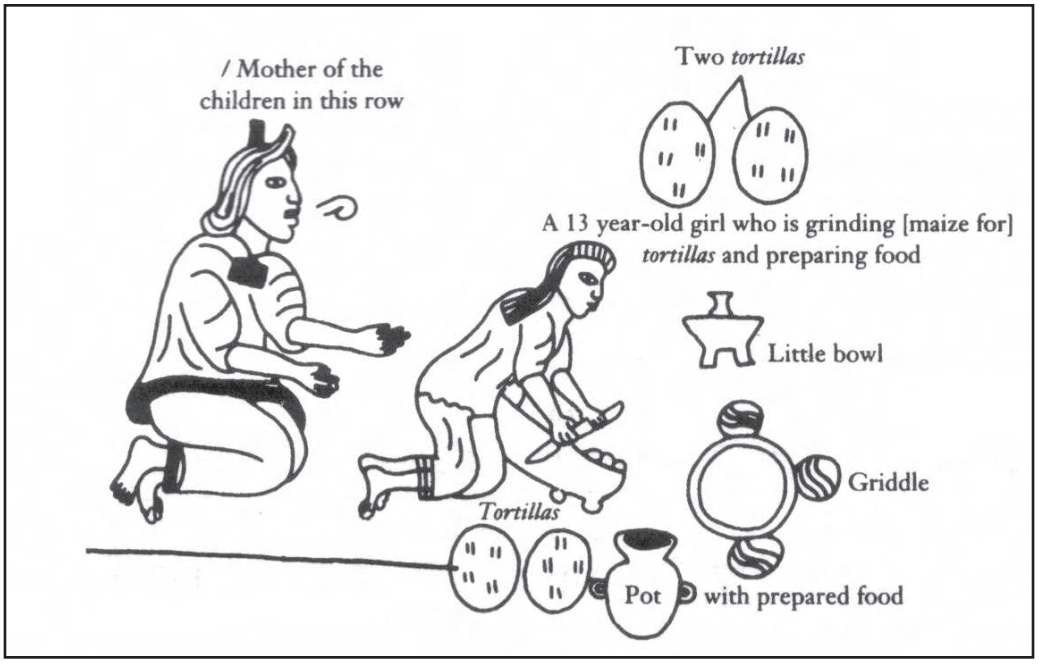


Figure 4.25. An Aztec daughter being taught by her mother to grind maize and make tortillas. (Smith 2003:62 [Codex Mendoza]).

Summary

Each condition mentioned above (type of stone, style of metate, and the individual grinding) has an optimal factor that would contribute to the most efficient grinding situation. Vesicular basalt is considered the best material for grinding stones (Hayden 1987b:14). New vesicles are exposed as the metate and mano are used, giving the stone a surface that is consistently rough. According to Adams's experiments, the flat and trough metate styles are equally efficient when grinding soaked corn. Finally, having an experienced woman operating the grinding stone would provide the most efficient grinding of maize.

Unfortunately, these variables are not available in the ethnographic data on grinding times. The results of four Mesoamerican women who ground a specific amount of corn from nixtamal to masa during my research will show the estimated time it would take from start to finish. The study also verifies some of the outcomes of the research

mentioned above (i.e., flat and trough metates grind soaked corn at equal rates of time [Adams 2002:68-69]). But first, I will describe the estimated grinding times found in ethnographies from around Mesoamerica to determine some middle ground.

Ethnographic Data

In searching for data on grinding times in Mesoamerica, I found five different sources for the time women dedicate to grinding maize daily (Isaac 1986). I will present these along with my own ethnographic work among the Q'eqchi' and K'iche' of the Highlands in Guatemala.

First, Beverly Chiñas (1973) studied the roles of women in a Zapotec community in the Isthmus of Tehuantepec, Oaxaca, Mexico. Speaking of some of their household duties, she said,

> Tasks other than child care also demand attention from women of the household, cutting into the time which can be used to increase household income. But household tasks require rather less time in the Isthmus than might be expected, because of … a few simple but significant technological advances such as the mechanical nixtamal mill which saves six or eight woman-hours daily formerly devoted to grinding by hand. (Chiñas 1973:41)

Important to note about Chiñas's estimate of six to eight hours is that she is using the term "woman-hours." It indicates that the grinding may not be the sole responsibility of one woman. According to Isaac (1986:16), this may be a plausible case due to the larger household size in this community in comparison to the other ethnographic accounts. Also, families in Guatemala usually divide the work of grinding among the mother, daughter-in-laws, and daughters who learned to grind in their younger teenage years.

Beginning in 1957, Evon Zogt spent much time with the Tzotzil-speaking people

of Zinacantan, Chiapas, Mexico. His research also touched on the preparation time of maize for tortillas. A significant aspect of this account is that all the grinding was done solely on the metate.

> After being washed, the kernels are placed on a metate to be ground, ordinarily two or three times. The metates in use in Zinacantan are three-legged types made of basalt by the neighboring Chamulas and sold in the market in Chamula or San Cristóbal. They are placed on a board which raises them about 12 inches off the floor and makes it easier for women to grind in a kneeling position.
>
> The grinding process is long and arduous. Women start in the morning between 5 and 6 and it is often 8 A.M. before they have produced enough tortillas for the day's meals. As soon as a woman has enough dough ground, she begins to pat out tortillas and to cook them...
>
> Once cooking begins, a remarkably efficient set of operations is in process—for a woman may simultaneously be grinding additional corn, stopping to pat out tortillas when more are needed, and cooking tortillas on the *comal.* All the materials and instruments are within her reach from her kneeling position at the metate. (Vogt 1970:53-54)

Although Vogt is vague on his estimated grinding-time, we can roughly determine that it took the women of a Zinacantan household three to four hours to complete grinding and cooking all the tortillas in the morning. I will return to discuss how simultaneously grinding masa and cooking tortillas plays into this and other estimated times.

In an introductory reader to Aztec archaeology and ethnohistory, Smith (2003:131) refers to "modern Mesoamerican peasant women" and compares them to ancient Aztec women. Although there are no ethnographic works cited for this comparison on grinding times, it represents yet another interpretation of how much time women dedicated daily to grinding maize.

> Commoner women spent much of their work time cooking and preparing food. Grinding corn for tortillas and *tamales* was the single biggest task. Before the advent of mechanical mills, modern Mesoamerican peasant

> women would spend five or six hours each day grinding corn for the family's meals. Aztec women must have spent a similar amount of time at the *metate* (grinding-stone). (Smith 2003:131)

George Foster conducted fieldwork among villagers in Tzintzuntzan, Michoacán, Mexico, intermittently in 1944, 1946, and 1958. At the time of conquest, Tzintzuntzan was a great city and the capital of the Tarascan Empire (Foster 1979:6). Foster's work focused on the modern mestizo village of 2,200 inhabitants in the middle of the twentieth century, and he considered some of the changes facing this rural community similar to others in the world's developing countries.

As with previously described ethnographies, a portion of Foster's research focused on the peasant society and their daily routine. He explains the woman's duty of grinding maize and cooking tortillas for her family:

> After grinding, nixtamal becomes a dough, masa. The careful cook regrinds this little by little on her metate, stopping to scoop up the resulting varves from each stroke of the *mano,* the cylindrical grinding stone which she holds in both hands. Small daubs of dough are patted into tortillas, an operation that takes about fifteen seconds for each….A good worker who is not interrupted can make and cook four liters of tortillas— 65 or 70— in about an hour; this meets the needs of an average family. In contrast, thirty years ago before mechanical mills were introduced, hand grinding of the nixtamal alone required an additional two hours of backbreaking work, time which was found by arising two hours earlier than at present. (Foster 1979:52)

This account estimates grinding, without the aid of a "mechanical mill," to be approximately three hours. Foster also included the step of patting small daubs of dough into tortillas in the hour of the final grind of nixtamal. In my 2003-2004 fieldwork, I had also observed this behavior among the Q'eqchi' of Alta Verapaz. Rosa Ca'al, during the final grind, will grind out enough dough for one tortilla (Figures 4.26 and 4.27). She will pat out that tortilla (Figure 4.28) and after laying it on the *comal* (ceramic cooking plate)

Figure 4.26. Rosa Ca'al, a Q'eqchi' of Alta Verapaz, Guatemala, grinds out enough masa for one tortilla.

Figure 4.27. A small mound of masa collects at the distal end of her metate.

Figure 4.28. Rosa pats out one tortilla before returning to grind masa for the next.

to cook, will then return to grind enough dough for the next tortilla. Usually during the time she is laying the freshly patted tortilla out on the *comal*, she will check the other tortillas to determine if they need to be turned over or removed from the heat.

The Q'eqchi' continue to use metates for a final processing of corn and other foods. Most use them daily and some women still use them to grind corn for every meal. Rosa Ca'al, the woman in the photographs above, had ground the amount of corn needed for one meal with a metal hand grinder. She then proceeded to do the final grind on the metate and cooked the individual tortillas intermittently. It took approximately 20–30 minutes to complete the fine grind and cooking of the small amount of corn used for this

meal, one that fed five adults.

This process of a fine grind and cooking the tortillas simultaneously is similar to Vogt's description of the Zinacantecos and Foster's account of women in Tzintzuntzan. The concluding "fine grind," while also individually cooking the tortillas, appears to be common practice among at least three (including the Q'eqchi') of the examples presented.

The last reference to daily grinding-time is Oscar Lewis's observation in Tepoztlán, Morelos in the 1940s. He briefly mentions that the introduction of a mechanical mill to this area freed women from four to six hours a day.

Daily Grinding-Time Estimate

The paucity of data on grinding times makes estimating an accurate mean time a difficult task. Isaac also briefly analyzed the estimates of grind-times of Lewis, Foster, Vogt, and Chiñas. He points out that a pre-industrial Mesoamerican peasant woman, in addition to the preparation of food, would be responsible for "all of the household's marketing (which may require quite a bit of foot travel), some or all of its pot-making and weaving, and all of its childcare and its laundry (the latter, but hopefully not the former, on a rock at the spring or well); in addition, she cares for a small flock of turkeys…and tends a kitchen garden that provides essential greens" (Isaac 1986:15).

Isaac brings up an evident question. How would a woman have time for these other activities if a third of her waking hours were spent grinding? This question makes me especially skeptical of the claims by Chiñas that maize processing on a metate occupied six to eight hours of a woman's daily work time. It seems that the energy expended grinding such a long amount of time is not compatible with the full range of domestic tasks required.

For estimation purposes, a simple average of the median times given by these

Table 4.4. Average amount of time per day dedicated to grinding maize derived from median of each range.

	Estimated Time (hours)		
	Minimum	Maximum	Median
Chiñas (1973)	6	8	7
Vogt (1970)	3	4	3.5
Foster (1979)	3	3	3
Lewis (1949)	4	6	5
Smith (2003)	5	6	5.5
		Average median time	**4.8 hours**

five ethnographic descriptions can be made (Table 4.4). Although the situations and circumstances were probably different in every case, this helps in narrowing down the amount of time it took to grind corn to a time of 4.8 hours a day. At first, this number seemed too high, and I was more inclined to feel that on average, women were grinding in the range of three to four hours a day: two to three hours being dedicated to grinding out a rough grind and one hour or so performing a fine grind and cooking the tortillas. But my experiment with four women in Guatemala resulted in a time close to the average mentioned above.

Grinding-times Recorded in Guatemala, 2004

In May and July of 2004, I conducted a number of surveys among the Q'eqchi' and K'iche' of the Guatemala Highlands. Part of this research included recording the time it takes to grind and cook tortillas. I included some controls such as only grinding boiled maize, and the tortillas were cooked immediately after or during the process. I used a small tin cup that held 12 ounces of nixtamal and used this same amount with each woman. Initially, six women agreed to and participated in the experiment, but only four of them completed the task according to the controls set, so only the data recorded from these four women were included in the analysis.

I divided the process into stages: first grind, second grind, third or fine grind, making and cooking of tortillas. Sometimes, as stated above, the third grind and the patting out and cooking of tortillas was combined. I included the time it took to do the fine grind (Table 4.5) for each as well as the patting out of tortillas (Table 4.6). This is because these two processes were consistent between the Q'eqchi' and K'iche' participants. In other words, the K'iche' participants tended to grind more times for the rough grind (three to four times as opposed to two), until they reached a consistency that suited them. The total grinding time (Table 4.7) for 12 ounces of nixtamal, from the first grind until they were removed from the comal, are listed below for all four women.

To summarize the tables, on average the women took 24 seconds to grind out each tortilla on the final grind. They averaged 34 seconds each tortilla when it came to forming or patting them out. Last, for six to seven tortillas, the women averaged 18 and half minutes to finish the whole process. This translates to approximately two minutes and 50 seconds of grinding, forming, and cooking to produce one tortilla.

What is the *total* daily time a woman in Mesoamerica dedicated to grinding and making tortillas? I surveyed a few people about the number of tortillas one might eat at one meal. Among the Q'eqchi', one person might eat three to five tortillas each meal. The K'iche' said that eight to ten was the norm. I realized that these averages were about the same amount of corn consumption because the Q'eqchi' tortillas are bigger in diameter than those of the K'iche'. So on average, a person might eat six and a half tortillas at each meal, meaning that close to 20 tortillas are consumed by one person per day.

To make tortillas for one person for one day would translate to approximately 56 minutes of grinding and cooking time. For a household of five people, this could take close to four and a half to five hours. None of the ethnographic accounts say how many people were being fed by the tortillas ground in each specific time, so it is not possible

Table 4.5. Third and final grinding time for four women on each tortilla made.

	Tortilla Number (Amount of time/seconds)							
Person	1	2	3	4	5	6	7	Average
Amalia Tiul Chub Che (Q'eqchi')	—	27	24	19	16	22	—	21.6
Sebastiana Chol Che (Q'eqchi')	—	19	18	20	19	37	—	22.6
Manuela Tziquin Tambriz (K'iche')	—	—	28	25	23	23	—	24.75
Ana Tzep Tzikin (K'iche')	33	33	33	16	16	16	42	27
						Average		**24 sec.**

Table 4.6. Time spent by women patting out each tortilla.

	Tortilla Number (Amount of time/seconds)							
Person	1	2	3	4	5	6	7	Average
Amalia Tiul Chub Che (Q'eqchi')	—	37	45	45	37	36	—	40
Sebastiana Chol Che (Q'eqchi')	38	40	33	47	53	58	—	44.8
Manuela Tziquin Tambriz (K'iche')	30	—	15	21	22	21	22	21.8
Ana Tzep Tzikin (K'iche')	27	31	30	32	30	35	22	29.6
							Average	**34 sec.**

Table 4.7. Total grinding time for four women.

Person	Time (min)	# of Tortillas	Amount of Nixtamal	Metate Type
Amalia Tiul Chub Che (Q'eqchi')	20	6	12 oz	Eastern (restricted)
Sebastiana Chol Che (Q'eqchi')	17	6	12 oz	Eastern (restricted)
Manuela Tziquin Tambriz (K'iche')	21	7	12 oz	Western (unrestricted)
Ana Tzep Tzikin (K'iche')	16	7	12 oz	Western (unrestricted)
AVERAGE	18.5	6.5	12 oz	

to compare daily times among them when using the number of people consuming the tortillas. But, according to the estimated times it took the four women in my study, the mean time of 4.8 hours is close to the time it would take to prepare tortillas for a family of five people.

Many other factors also effect how long it would take to grind maize for each day's meals. In many cases, women have help from other female family members. Also,

the age of the person determines how many tortillas he/she will eat. A child will not eat as much as an adult. Of the four women, they were able to make either six (Q'eqchi') or seven (K'iche') tortillas within about the same time, give or take three to four minutes. Again, this averaged to about three minutes per tortilla. Altogether, this experiment provides further evidence that grinding maize was an activity that took up about a third of the day in the life of Mesoamerican women.

Summary

Women of Mesoamerica have dedicated many hours of everyday to grinding maize on metates. The different ethnographic accounts show that an average of four and a half hours a day may have been dedicated to this task. But again, these times are subjected to many other factors such as the size of the family.

With so much time being allotted to one specific chore, the controlled experiment is especially beneficial in narrowing down the estimates presented in this paper by the various ethnographers and in offering a more defined representation of this aspect of the daily life and responsibilities of pre-Columbian Mesoamerican women.

Items Processed on Manos and Metates

Although the experiment above deals only with the grinding of maize, there are many other foods and non-edible items ground with manos and metates. During my work with the Highland Maya, I only encountered people using grinding stones to process food products. A list of these foods appears in Table 4.8 and includes the Spanish, Q'eqchi', and K'iche' names for each item.

The grinding of maize was the principal use of most manos and metates. The Q'eqchi' normally used one grinding stone to grind all food products, including corn. Occasionally they would have another metate for grinding coffee. The K'iche' typically

Table 4.8. Types of foods processed using manos and metates with corresponding names in Spanish, K'iche', and Q'eqchi'.

Food	Spanish	K'iche'	Q'eqchi'
boiled corn	nixtamal	tzih	buch
corn	maíz	ixiim	ixim
corn dough	masa	q'or (drink made from masa)	k'em
coffee	café	kapeh	cape
chili	chile	iik	ik
chocolate	cacao	—	cacau
toasted corn	maiz totada/pinol	k'aj	caj
garlic	ajo	—	anch
tomato	tomate	pix	pix
achiote	achiote	k'oxob'	xayau
beans	frijole	kinaq'	quenk
onion	cebolla	—	ceboy
pepper	pimienta	—	—
tortillas (for animals)	tortilla	lej	cua
tomales (for chickens)	tomales	sup	poch
fresh corn from cob	elote	mux	—
chile sauce	pulique/recado	joc'o'm	—
horchata (sweet drink)			
cinnamon	canela	canel	canel
rice	arroz	aroz	aroz

Note: An em dash (—) indicates that there was no word given for this food or that this food was not reported to be processed on grinding stones.

owned three metates that were being used at the time of my research. One was for grinding corn, one for coffee, and a small mano and metate for achiote and chile. As mentioned earlier, a comparison between metate size and function will determine if a correlation exists between these data in Chapter 5.

There were only three additional uses, other than grinding, for the mano and metate. Elvira Ca'al Che said that if a child bites someone, a way to punish the child was to make him bite a mano one to three times. This was also mentioned by Domingo Yax

Ca'al. She said that when a child is still nursing, if he bites the nipple, the mother can put the mano in the child's mouth. This hurts the child's teeth, prompting him not to bite again. Another use for the mano is using one of the ends to knock out loose teeth. Last, I observed a woman using an end of her mano to mash a few cloves of garlic in a plastic bag, which was resting on the metate surface.

Resurfacing/Resharpening

Over the use-life of manos and metates, the rough surface on the stone needed to break and grind materials, can become very smooth. The rougher the surface, the easier it is to break up kernels of corn or coffee beans. Most people periodically resurface or roughen the grinding surface of their metates and manos. This is done by carefully pecking the surface of the metate with the pointed tip of a machete. The pecking exposes more vesicles of the basalt which creates a surface described in Q'eqchi' as *k'es* or "sharp." Petrona Tzikin Tambriz, a K'iche' informant, told me that they resharpen by rubbing the mano over the grinding surface without anything actually being processed on the metate. This abrasive action would result in the removal of a fine layer of stone and would also expose new vesicles.

Figure 4.29 shows that the Q'eqchi' resurface their manos and metates more often than the K'iche'. Considering that there were 25 percent more Q'eqchi' people interviewed than K'iche', these totals should be viewed separately. But Figure 4.29 shows that there are distinct modes in each of the two groups. On average, 73 percent of the K'iche' interviewees reported to occasionally (once every two to five years) or never resurface their grinding stones. The opposite is true of the Q'eqchi' population. 73 percent of the Q'eqchi' resurface their grinding stones one to four times a year.

These numbers only strengthened the notion that because the K'iche' use their manos and metates less frequently than the Q'eqchi', they have less of a need to

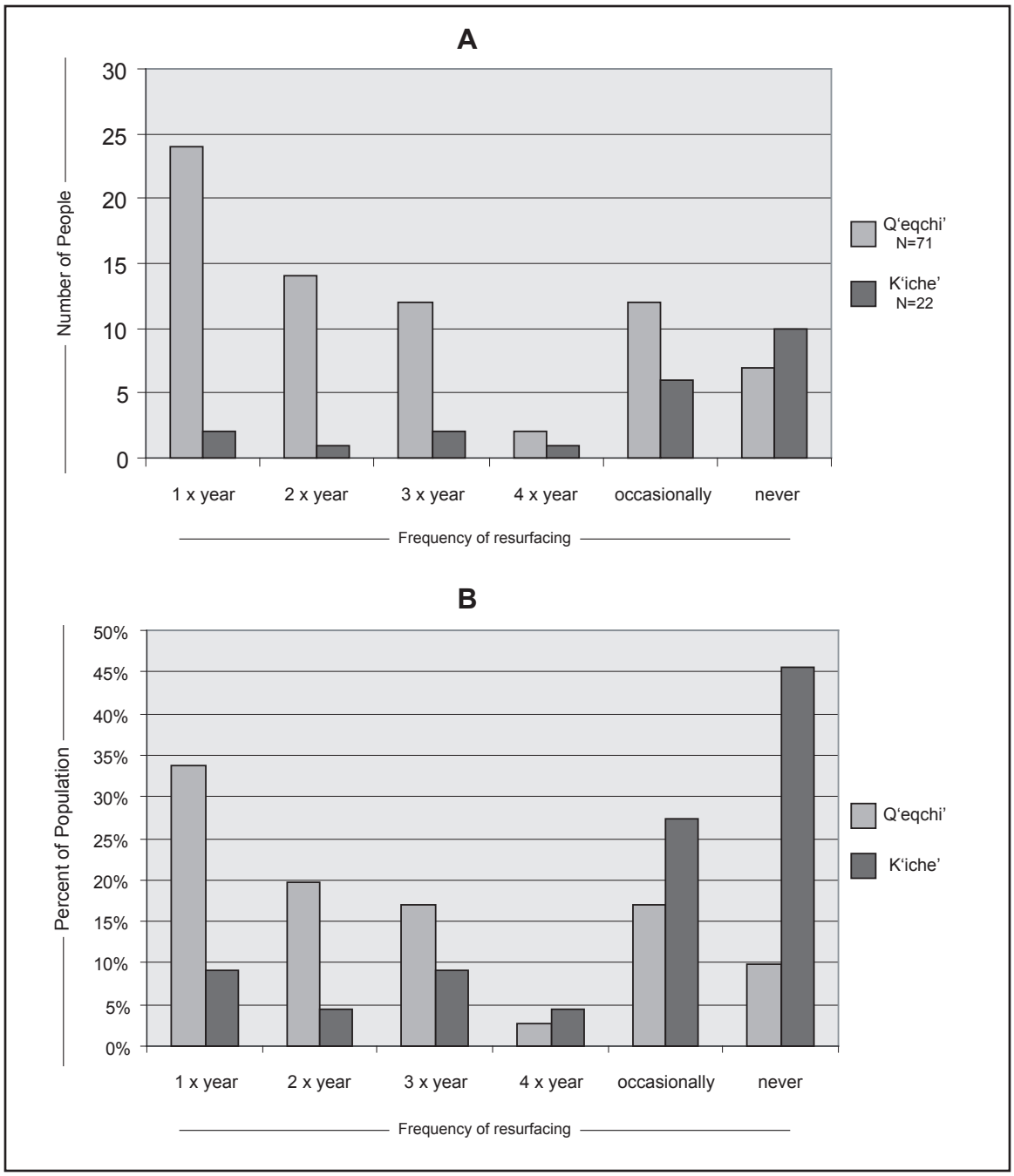


Figure 4.29. Frequency of resurfacing among the Q'eqchi' and K'iche'; (*a*) shows the actual number of people and (*b*) shows the percent of the Q'eqchi' or K'iche' population.

resharpen them. Many K'iche' informants reaffirmed that they do not use their grinding stones as often as they did 30 years earlier; therefore, there is no need to resurface them. Some other reasons for not resurfacing manos and metates are because the people were

afraid of breaking the grinding stones, or they did not know *how* to resurface them.

Discard/Reuse

Most of the people who participated in my survey had never broken a metate or mano. Out of the 13, only two people reuse their broken grinding stones. Data on the discard and reuse of manos and metates came from 13 informants. Table 4.9 lists whether a mano or metate had broken, its current status, and other notes such as the location of a discarded mano or the secondary use of a metate. The house number in which the broken grinding tool was reported is also listed.

A total of 13 people reported to have broken at least one grinding stone implement. Nine were manos and 4 were metates. In addition, one mano and metate set were burned in a house fire and were never recovered (see Table 4.9, PAN-06). The majority of the broken manos and metates were discarded outside of the house. When possible, I asked if I could see the discarded stones, but eight of the thirteen broken manos and metates were either thrown out and forgotten about or were buried somewhere around the house. A discarded metate was shown to me at house IXT-20 (Figure 4.30).

As mentioned, two people reported reusing their broken manos and metates. Lorenzo Guachiac had both a broken mano and metate (Figure 4.31). His wife uses them as a set to grind coffee and chile. The metate fragment is the distal end of a smaller Western style metate. The mano looks to be about half of a larger sized mano which was probably about 50 cm long before it broke. Maria Elean Guachiac also had a broken metate that was originally used for grinding corn. Now she uses it to grind coffee. These were the only two instances that I encountered during my research.

Summary

This chapter has covered the data I collected during both field seasons. Many new

Table 4.9. Manos and metates reported to have broken.

House Number	Mano or Metate	Current status	Notes
CHI-06	mano	discarded	They buried the mano somewhere around the house, but they don't know where.
CHI-11	mano	discarded	The broken mano was just thrown out and she doesn't know where it is.
CHI-17	mano	storage	The mano that the children broke is in storage and not being used.
CHI-19	mano	discarded	The mano broke, so they threw it out.
CHI-35	metate	discarded	The metate broke after one of the kids was playing around, knocked it over, and broke it. So they just burried it.
IXT-07	mano	discarded	A mano was broken, but they threw it out.
IXT-15	mano	discarded	A boy broke a mano and they threw it out, but they made sure to measure it before they went to the market to buy a new one.
IXT-16	mano and metate	recycled	Metate and mano used for grinding coffee and chile. It is the distal broken end of a small metate (see metate and mano IXT-16-4 in Appendix B and Figure 4.31).
IXT-20	metate	discarded	They just threw the metate outside of the house after it broke. See figure 4.30.
IXT-23	metate	recycled	The metate is now used for coffee (see metate IXT-23-3 in Appendix B).
PAN-01	mano	discarded	The mano was thrown out 25 years ago and a new one was purchased to replace it.
PAN-06	mano and metate	discarded	There was a mano and metate that burned in a house fire. They left the metate and mano in the burnt rubble.
PAN-27	mano	storage	The mano is lying on the dirt between the kitchen and the main part of house. It is not being used for other purposes. They say it is not useful anymore.

Figure 4.30. Discarded metate fragment found at house IXT-16.

Figure 4.31. Mano and metate IXT-16-4. This was a broken grinding stone set that is being reused to grind coffee and chile. Top photo is the dorsal side of the metate and the bottom is the ventral.

characteristics and behaviors associated with manos and metates have been reported such as the taboos that govern the handling of grinding stones and customs related to their exchange. The final chapter covers the implications of the data collected. It also shows how this new ethnographic information can aid in the interpretation of manos and metates recovered from archaeological contexts.

5 New Archaeological Interpretations of Manos and Metates

Behaviors Associated with Wear Patterns

During research, there were manos and metates proposed to be very old (100–150 years, or 3–4 generations old), and they showed many different signs of wear. On metates, the main evidence of use is on the grinding surface. The results of my research also showed a variety of wear patterns on manos that differed between the Western and Eastern styles. I will explain these variations in use-wear by describing patterns that are associated with the different styles: Eastern and Western.

Eastern Style Wear Patterns

Metates of the Eastern style, as described in Chapter 3, have preformed, recessed troughs. Over time and much use, these troughs can become very deep. Figure 5.1 shows a mano and metate that are reported to be 150 years old. The mano is very thin, and the metate has a trough depth of about 4-5 cm. This set has been passed down over three generations of women. The variation in the depth of a trough of over time depends on the frequency of use, hardness of stone, as well as the experience of the person using the grinding stone. But normally, Eastern style metates that have been extensively used exhibit a deep trough.

During my analysis of grinding times among the Q'eqchi'– who use the Eastern style metate – I noted that only about three-fifths of the surface of the metate is used for

Figure 5.1. A Western style mano and metate from Pantoc, Alta Verapaz. It was reported to be 150 years old and exhibits a very deep trough.

grinding. The elevated, proximal end of the grinding surface holds the nixtamal that is going to be ground, whereas the far distal end holds any masa that is pushed to the end of the metate during grinding. Unlike the K'iche', who use an *ac'qeen* (Figure 5.2) to catch food that falls from the metate during grinding, I never observed the Q'eqchi' allowing any food to fall off the end of the metate. They use less of the grinding surface to accommodate the mass of ground food that collects at the distal end of the metate (Figure 5.3).

I was also informed that Eastern style manos (manos used with a restricted/trough metate that are lenticular in longitudinal cross-section) had two broad grinding surfaces with specific purposes. Using two sides of the mano is usually dependant on the preference of the woman grinding. One side is used for the *poch'oc* (Figure 5.4), or the "rough grind" of maize. The *poch'oc* side is usually rough with more vesicles exposed which help to "grab" whole kernels of corn and grind them into the surface of

Figure 5.2. Ana Tzep Tzikin using an *ac'qeen* to catch food that falls off the end of her metate.

Figure 5.3. Nixtamal in the process of being ground. Notice the area at the distal end (right-side of picture) that is used as a shelf on which the masa rests after it has been ground.

Figure 5.4. The *poch'oc* side of an Eastern style metate.

Figure 5.5. The *litz'oc* side of an Eastern style metate.

the metate during the first and second grinds. The opposite surface is used for the *litz'oc* (Figure 5.5), or the "fine grind." It can be highly polished with few vesicles exposed. These attributes of Eastern style manos indicate that many of the manos found during archaeological excavation may have been used on both sides, with each side dedicated to either the rough or fine grind. Further study may even show that this double-sided attribute may be applicable to any type of mano that shows wear on two surfaces.

Another observation I made was that the thickness of Eastern style manos may be indicative of the amount they are used over time. I measured several Eastern style manos in the markets of Coban, Alta Verapaz and found that their thickness (i.e., square transverse cross-section) is the same as the width of the grinding surface of the manos (Figure 5.6). The manos are manufactured to be quadrilateral, but over time become thin in shape and more rectangular in transverse cross-section after much use. Clark

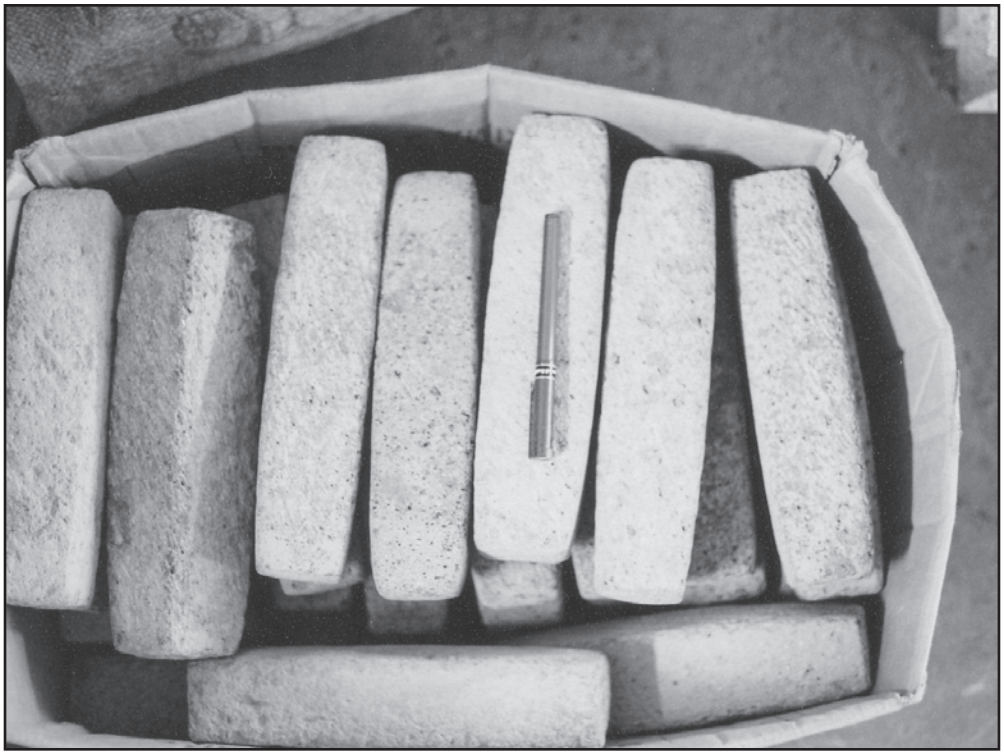


Figure 5.6. Newly manufactured, Eastern style manos. These show how the mano length is the same as the width when first produced.

(1988:91) explained that the amount of attrition on unrestricted manos can be calculated by comparing the original thickness of the unmodified ends of these "dog-bone" shaped *brazos* (*brazos* is a word used by Clark [1988] to identify manos I describe as the Western style). If it is true that Eastern style manos have always been manufactured to be the same height as the width of the grinding surfaces, then the rate of attrition for these manos can also be measured by simply subtracting the height from the width. For example, mano CHI-04-1 (see Appendix B, Table 5) has a width of 5.5 cm and a height of 5.25 cm. So my hypothesis is that over the ten years the owners have used this mano, it has worn down 0.25 cm. This translates to less than a millimeter of attrition per year.

There are other conditions that should be factored into this equation. For example, the people who own this mano use it before every meal, three times a day, but only for the final grind of their masa. Pre-Columbian women used their manos and metates much more each day because they would have had to perform the rough grinds on the stone as well. In addition, the amount of maize ground each day would be determined by the number of people it was to feed. A family of ten would require twice the amount of processing time on a metate than a family of five.

Western Style Wear Patterns

The most obvious areas of wear on the Western style metates are at the distal end of the grinding surface above the distal legs (cf. Clark 1988:92, Figure 39; Hayden 1987a:190, Figure 5.17). As stated, I observed the Q'eqchi' only using about three fifths of the grinding surface on Eastern style metates. This was observed as well among the K'iche' during grinding (see DVD chapter, "Grinding with the K'iche'). The downward stroke terminates approximately 3-4 cm from the end of the metate, resulting in the metate basin being thinner above the distal legs than at the proximal end of the grinding surface where the mano is rarely passed over. This is because the maize usually rests in a

pile at the proximal end.

Clark (1988:91) also explained how the rate of attrition can be calculated on unrestricted metates that are like the Western style described in my research. He suggested that "by comparing the original thickness of the metate basin at the proximal end with the worn area (thinnest area of basin, probably near the distal end) one can calculate the amount which has been worn away" (Clark 1988:91). I did not record basin thickness during my survey, so this information on the Western style metates of my research can not be calculated at this time.

Also mentioned above is the appearance of "dog-bone" shaped manos among Western style grinding stones. This is caused by the wear of the edges of the metate on the mano (Figure 5.7). As women hold the mano at each end to grind, the friction works to remove stone from both the mano and metate which creates a dog-bone shaped mano. Figure 5.7 shows a Western style metate that had been used to grind coffee. Conveniently, the coffee left a stain on both the mano and metate that shows where the majority of contact took place during grinding.

Figure 5.7. Western style mano that exhibits the "dog-bone" shape. Coffee stain shows where the mano makes the most contact with the metate surface.

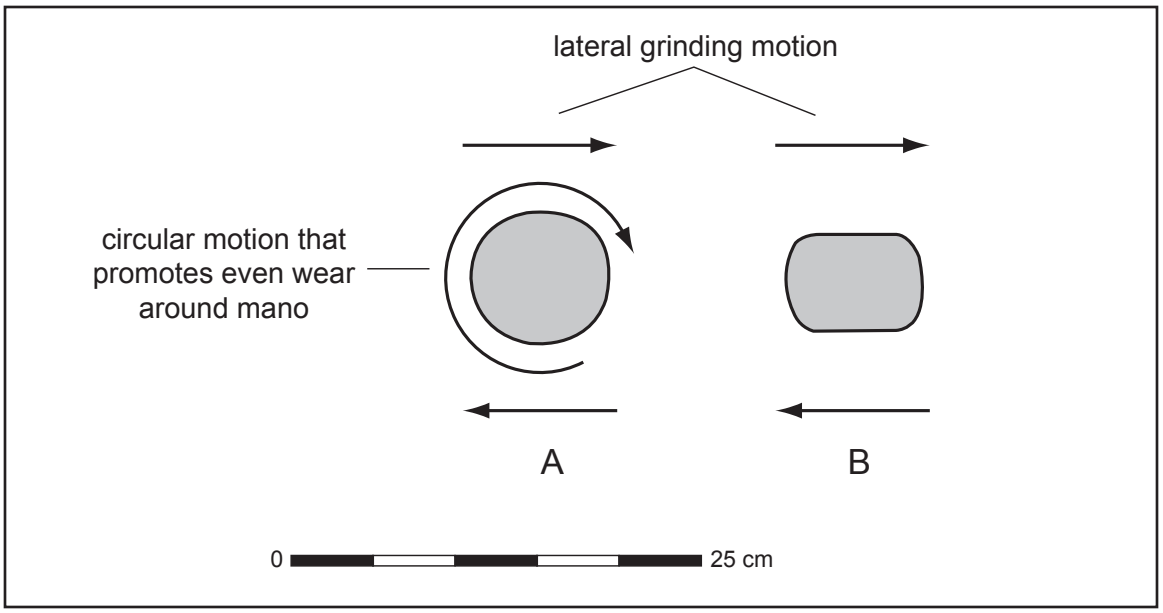


Figure 5.8. Transverse cross-sections of manos that exhibit the "dog-bone" shape. *A* shows a mano that has been slowly rotated during grinding. *B* is an example of a mano that is worn and used on only two surfaces/sides.

I also observed a sub-category of manos that are characteristic of the Western style. Some of the manos clearly had two distinguished grinding surfaces, whereas others were worn evenly all the way around (Figure 5.8). While watching Manuela Tziquin Tambriz grind maize, I noticed that she would turn the mano a fifth of a turn every 3-4 strokes while grinding. I asked why she rotated it, and she said that if they do not turn it, it will get too *tzra tzic* (squared). Rotating the mano ensured that it would wear evenly all the way around. Because I observed both round surfaced and double-surfaced manos among those with Western style metates, I determined that the shape of the mano depends on the grinding style preferred by the woman grinding.

Traditions Shared by the Q'eqchi' and K'iche'

During research with both the Q'eqchi' and K'iche', I observed many similarities in their belief systems, as well as the beliefs that guided the behaviors associated with manos and metates. One of the most prevalent was the gifting of manos and metates to

children who leave the parents' home after marriage. There were also similar beliefs in the *awas* analyzed in Chapter 4. I also discuss how manos and metates are now, and were anciently, used by all Mayans and are considered to be indispensable tools.

Multi-generational Use of Manos and Metates

Many of the Q'eqchi' and K'iche' surveyed during my research said that it was important for parents to give a mano and metate to each one of their children. Many people buy grinding stones even before their children are of age to marry knowing that one day they will need to give each of their children a mano and metate. This tradition is evident among both the K'iche' and Q'eqchi'. In addition, the Pokomam metateros mentioned practicing the tradition of giving a mano and metate to each one of their children.

Before comparing the multi-generational aspect of manos and metates between the modern and ancient Maya, it is important to address the differences in the amount of grinding being performed on these tools. Because of the introduction of hand-grinders and gas/electric mills, people today do not use their metates nearly as much as Mayan women even 100 years ago. The manos and metates of modern women last a much longer time and may be passed down over many more generations than those of prehispanic context. But, the custom of gifting manos and metates to newlyweds is still an actively practiced tradition among the Q'eqchi', K'iche', and Pokomam and perpetuates the manufacture and purchase of grinding stones. It may be true that metate gifting may also be practiced by many other Mayan groups today and may have been practiced anciently.

Awas

In Chapter 4, I discussed beliefs within Q'eqchi' and K'iche' culture associated with manos and metates. These included the taboos that deal with the handling and

use of grinding stones. Two *awas* are shared by the Q'eqchi' and K'iche'. Both groups mentioned the *awas* that if a mano or metate "sees" the stars or the moon, the grinding stones will break. They both also addressed the taboo related to pregnant women and grinding stones (Table 4.3). The K'iche' merged these two *awas* and said that if a pregnant woman were to take her metate outside at night under the stars, her unborn child would be born crossed-eyed. The similarities between these different modern Mayan groups may be indicative of traditions shared by Mayans before the Spanish Conquest.

Economic Status According to the Number of Metates in House

One of my original research questions for this thesis was to determine whether there was a correlation between the number of metates in the home and the economic status of the people who live there. My hypothesis is that people who are of a higher economic status own more metates, whereas those of a lower economic status have fewer metates. In order to record economic status of the people interviewed, John Hawkins (personal communication 2003) suggested recording the construction material of the floors, walls, and roofs of the dwellings of each person interviewed. He also suggested the use a ranking system in which the materials used to build the roofs, walls, and floors of houses were ranked according to how expensive the materials are in relation to one another (Table 5.1). For example, cinder-block walls are ranked higher than adobe walls because block materials are more expensive than materials needed for an adobe wall.

In my findings, there were only a few different types of construction materials found for each structure. Table 5.2 shows the materials included in my survey as well as their ranking. The types of materials and number of metates in the home were recorded on Form A during fieldwork (Appendix A).

In order to analyze the data, I had to take a few factors into consideration. First, I decided to use the number of metates currently owned as opposed to the number owned

Table 5.1. Suggested rankings of house construction materials according to expense of material (John Hawkins, personal communication 2003).

Walls:	Rank	Roof:	Rank	Floor:	Rank
bricks	7	concrete roof	6	ceramic tile	8
block	6	lamina/corrugated metal	5	mosaico	7
rock	5	teja de barro	4	cement	6
wood	4	duralitas	3	wood	5
adobe	3	tejas de manil	2	brick (clay)	4
brick and wood	2	paja/thatch	1	loza	3
bajareque	1			paved with stones	2
				dirt	1

Table 5.2. Rankings of house construction materials according to expense of material. The number of materials was reduced due to fewer of the items in Table 5.1 being recorded during survey in 2004.

Walls:	Rank	Roof:	Rank	Floor:	Rank
block	3	lamina/corrugated metal	3	cement/ceramic tile	3
adobe	2	tejas	2	cement	2
cane/wood	1	thatch	1	dirt	1

over their lifetime because the information recorded on house construction reflected the interviewees' *current* economic status. Second, I found that 97 percent (94 out of 97 people surveyed) had a *lamina* (corrugated tin) roof. I am not sure what this means, but according to Hawkins's ranking system (Table 5.1), everybody with a *lamina* roof would be on the higher end of the ranking system and, therefore, would be considered at a high economic level. This was clearly not the case. Due to the ubiquity of *lamina* roofs in my survey, I decided not to include them in my analysis in determining economic status. There is no significant correlation between *lamina* roofs and the number of metates in a household.

I also ranked only the construction materials found during my research in order to evenly distribute the ranking, and thus the economic status of people interviewed. If I were to have borrowed ranks from the system in Table 5.1, the economic status would have been skewed. For example, using the system in Table 5.1, a person with a dirt floor

and adobe walls would score a cumulative ranking of 4, whereas a person with dirt floors and block walls would have scored a ranking of 7. The difference makes for a wide range of economic status levels when the difference between these two households is essentially only the walls. In my analysis, the ranking of the dirt floor-adobe wall household would be 3 and the dirt floor-block wall house would rank a number of 4. The 3:4 difference in rank most resembles the variation I observed in the overall economic status of the people I interviewed.

The combined rank (floor+wall) was also assigned an economic status. People with a ranking of 2 are grouped in the "lower" economic status. Those with a combined ranking of 3-4 are considered to represent the middle economic status. High status was assigned to those with a ranking of 5.

A graphical display of the distribution of the number of people who have 1-5 metates in their home according to economic status is shown in Figure 5.9 (Figures 5.10 and 5.11 show the number of metates according to floor and wall materials). The graph in Figure 5.9 shows that more people of a lower economic status own fewer metates than those of higher status. At the other end of the spectrum, I expected the number of metates for those of a higher economic status to increase. The reverse was true, and the downward trend of fewer metates per middle and high economic level household also appeared. Although counter-intuitive, these patterns can be explained by observations I made during fieldwork.

Many of the K'iche' of Ixtahuacán rarely use their metates. Most go to the molino to have their nixtamal ground. Only three of the 24 people surveyed among the K'iche' grind a final time after the nixtamal is ground at the molino. Those who do not regrind have tortillas of coarser texture, but this characteristic is accepted by the K'iche', whereas the Q'eqchi' said that they would never eat a tortilla that was made of masa only processed at the molino. The molino costs money, but if there are funds available, it can

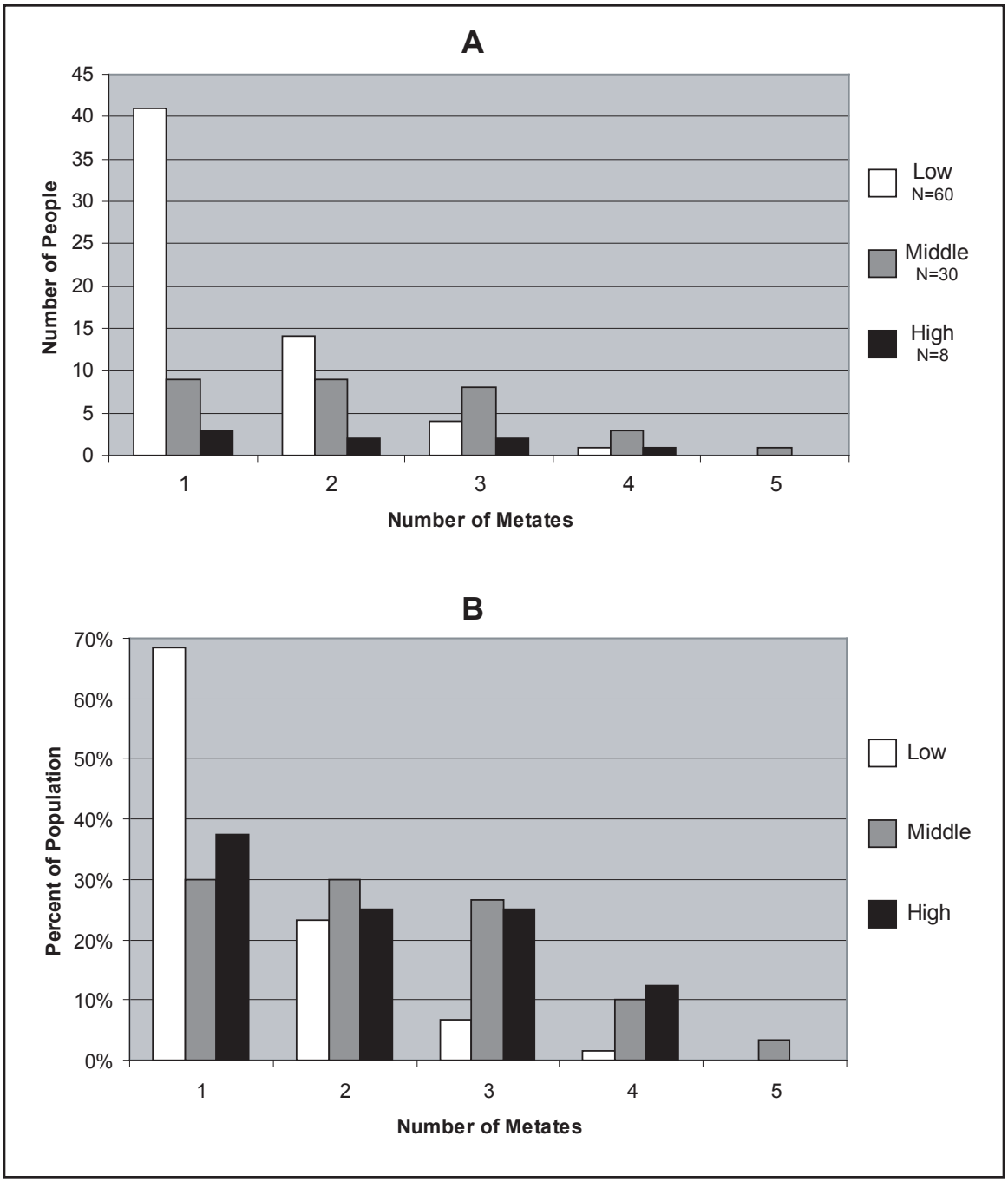


Figure 5.9. The number of people and metates in homes according to economic status (low, middle, or high); (*a*) shows the actual number of people and (*b*) shows the percent of each economic level.

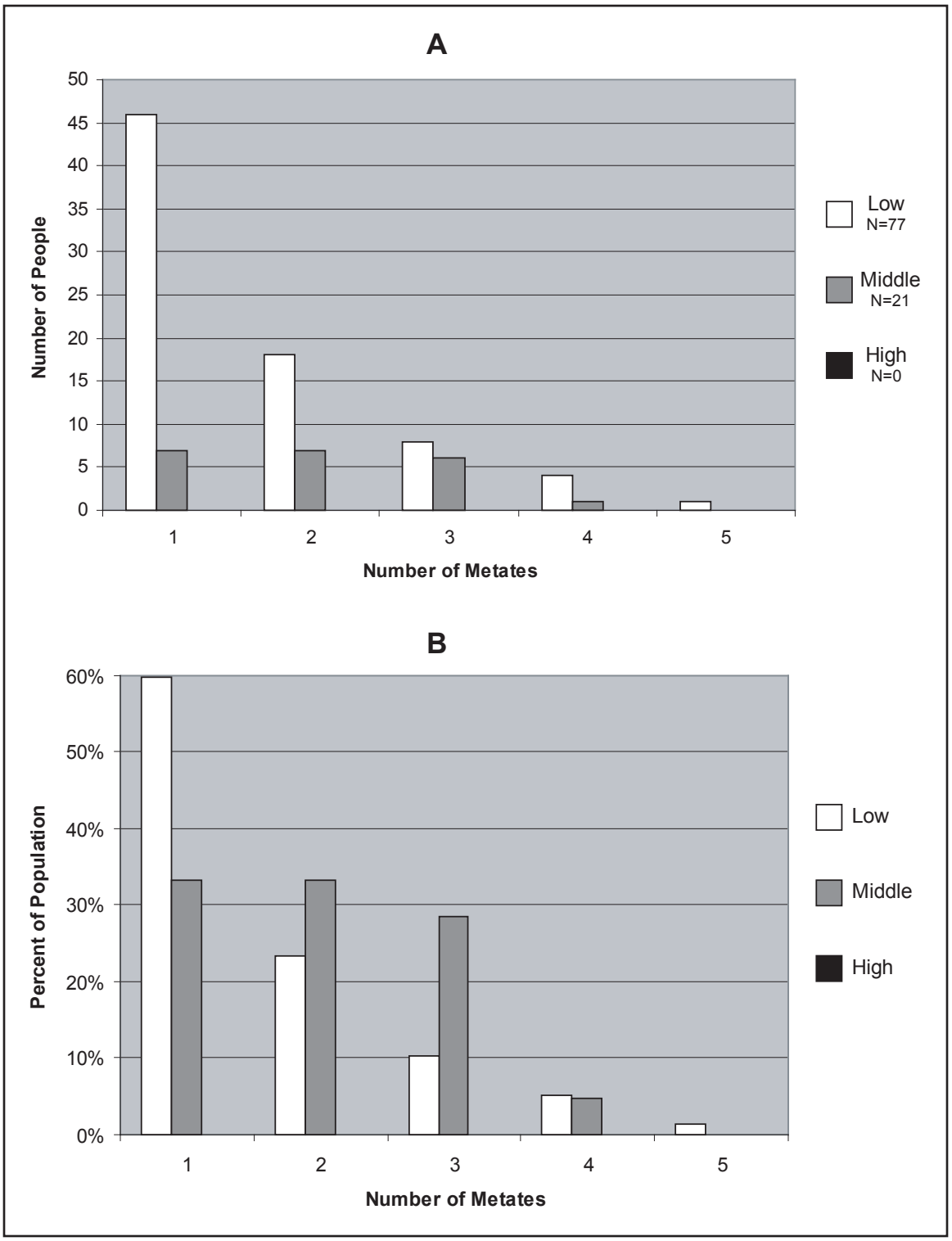


Figure 5.10. The number of people and metates in homes according to economic status derived from floor material (low, middle, or high); (*a*) shows the actual number of people and (*b*) shows the percent of each economic level.

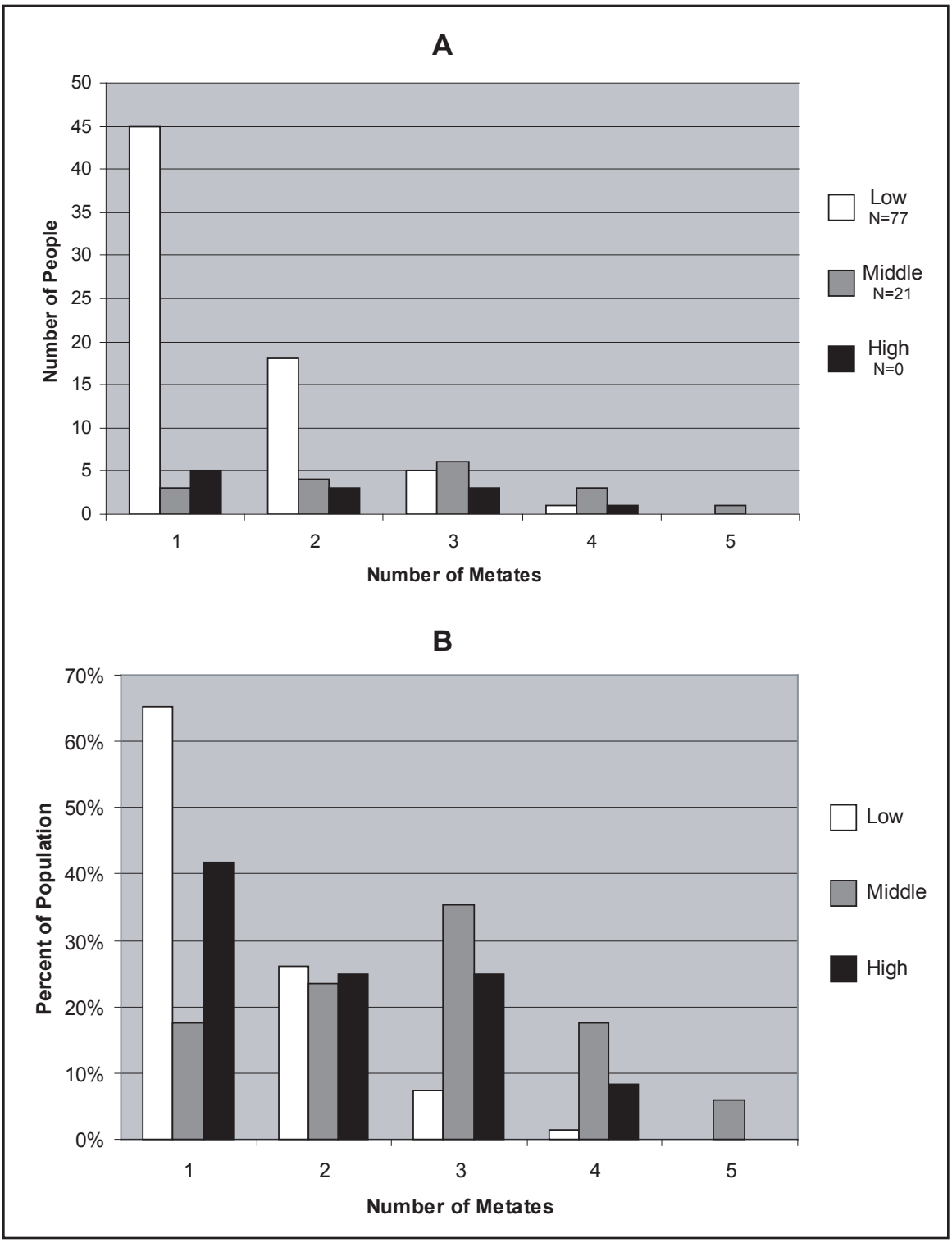


Figure 5.11. The number of people and metates in homes according to economic status derived from wall material (low, middle, or high); (*a*) shows the actual number of people and (*b*) shows the percent of each economic level.

significantly reduce the amount of time it takes to grind maize.

Seeing that Ixtahuacán only had 13 percent of the people who ranked in the lower tier of the economic scale, I determined that the other 87 percent in the middle or high economic level have more money to go to the molino and were also abandoning the use of their metates. The less they use their metates, the less of a need there is to purchase or own them. I went to a few houses located in an *aldea* of Ixtahuacán called Xeabaj where I found 3–4 people who had sold all their metates because they said they were not needed anymore. Part of the reason people of the middle and high economic status do not own more metates is because they see less of a need for them due to the convenience of the molino. The decline in the traditional use of manos and metates may only reflect modern trends. Although the data on the number of metates as an economic indicator supports my hypothesis to be true for the lower levels of the economic scale, further study of pre-Columbian houses may help to clarify whether higher status people owned more metates than those of the lower class.

Implications of Discard and Usage Location

Discard Location

Broken manos and metates have been found in the structural fill of many large buildings excavated in the Maya region (Kidder 1947; Moholy-Nagy 2003; Weeks 1983; Woodbury 1965). Clark (1988:94) pointed out that "most manos and metates found near a house were probably at one time used with the associated structure." My research showed that in most cases, people who determined broken manos or metates to be useless normally discarded the tools somewhere outside the perimeter of the house. Some mentioned they had just thrown them out into the *monte* (brush) or even intentionally buried them somewhere outside of the house (see Table 4.9).

More than likely, when people move, they do not take their broken manos and metates with them. People who once occupied house structures that are excavated today probably took any manos and metates they deemed usable and left broken pieces and fragments behind (Clark 1988:94). Clark (1988:94) also explains that it is rare to find a "whole, serviceable metate in an abandoned dwelling." On the contrary, rapidly-abandoned sites may yield information on manos and metates that were left as whole pieces and *in situ*, but these sites are rare as well.

Mano and Metate Location in Comparison to Cerén, El Salvador

Rapidly-abandoned sites refer to those where the occupants of structures were forced to vacate their dwellings, leaving most of what they owned in the locations they were likely used. Sites such as Cerén in El Salvador and Aguateca in the Peten of Guatemala were rapidly abandoned. In the case of Cerén (Sheets, ed. 2002), ash and debris from a nearby volcanic eruption covered and preserved artifacts, such as pottery and manos and metates, in the places they were left at the time of the eruption.

After I contacted Payson Sheets, the director of excavations at Cerén, he informed me that he would not be able to provide me with the data on manos and metates that were found at the site. I also requested plan maps of the structures excavated, but was denied these as well. The only resources available to the public on the topic of Cerén are a few articles and Sheets's volume *Before the Volcano Erupted*, which is a condensed version of the data from the 1979-1980, 1989-1993, and 1996 field seasons. I will use the few maps and provenience information on manos and metates from this book as a comparison to the plan maps I recorded on the use-location of manos and metates of the modern Maya. I will also use other ethnographic information gathered during my work among the Highland Maya to try and reinterpret some of the manos and metates, their locations, as well as artifacts associated with them at Cerén.

Description of the Site of Cerén, El Salvador

Cerén is located in El Salvador at the north end of the Zapotitán Valley. The site is located at 450 meters above sea level and has a tropical climate that makes maize cultivation productive (Sheets 2002b:1). The Zapotitán Valley is surrounded by the San Salvador volcano complex on the east and Santa Ana complex on the west (Sheets 2002b:2). It was the Loma Caldera vent, located 600 meters north of Cerén, that erupted at about AD 600 and covered the site with ash and tephra (solid matter ejected at the time of eruption) (Sheets 2002b:16).

The eruption forced the evacuation of Cerén's occupants, who left most of their belongings in their houses. What makes this site such a valuable source of information is that the artifacts found at Cerén were likely in the places originally used. Sites that have not been abandoned rapidly usually yield discarded items that were not taken when the site was vacated. Cerén offers a glimpse of where artifacts may have been located and what they may have looked like while people occupied the dwellings at this site.

Use Location of Manos and Metates among the Highland Maya

Most of the Q'eqchi' interviewed during my research explained that they have specified places for the use of their manos and metates. The Q'eqchi' usually place the metates that are used daily in the kitchen on a table (Figure 5.12). Occasionally, the proximal leg of the metate is rested on a post that is set in the ground about 30 cm away from the table (Figures 5.13 and 5.14). The distal legs rest on the edge of the table. All of the Q'eqchi' informants said that it was important that the metate and mano be used in the kitchen, although there were a few that used secondary metates in other rooms to grind coffee (see Appendix B, Table 6).

As stated in Chapter 4, the K'iche' do not use their grinding stones as much as

Figure 5.12. Metates used by the Q'eqchi' are placed on tables that are designated as their permanent use-locations.

Figure 5.13. Eastern style metate in with its proximal leg resting in a post that has been set in the ground (metate # CHI-28-1).

Figure 5.14. Eastern style metate with its proximal leg resting in a post that has been set in the ground (metate # PAN-09-1).

the Q'eqchi'. Due to infrequent usage, the manos and metates are usually stored along the walls of the kitchen (Figure 5.15) rather than occupying a permanent space. When I observed Manuela Tziquin Tambriz grind maize, she moved the metate and mano from their storage area on the wall in her kitchen (Figure 5.15). She placed them in an open area on the floor near the stove. The *ac'qeen* was also taken from storage – it was next to the manos and metates against the wall – and was placed on the floor under the distal end of the metate. Figure 5.16 shows the position most K'iche' women take on the floor when grinding on their manos and metates. I asked Manuela if there is a specific place in her kitchen where she always grinds, and she said that it depended on where there was space. There is not much area in her kitchen where she can put her metate due to other items occupying most of the floor space. If there was no room on the floor to place the metate for use, Manuela would simply move other items to accommodate her grinding stone.

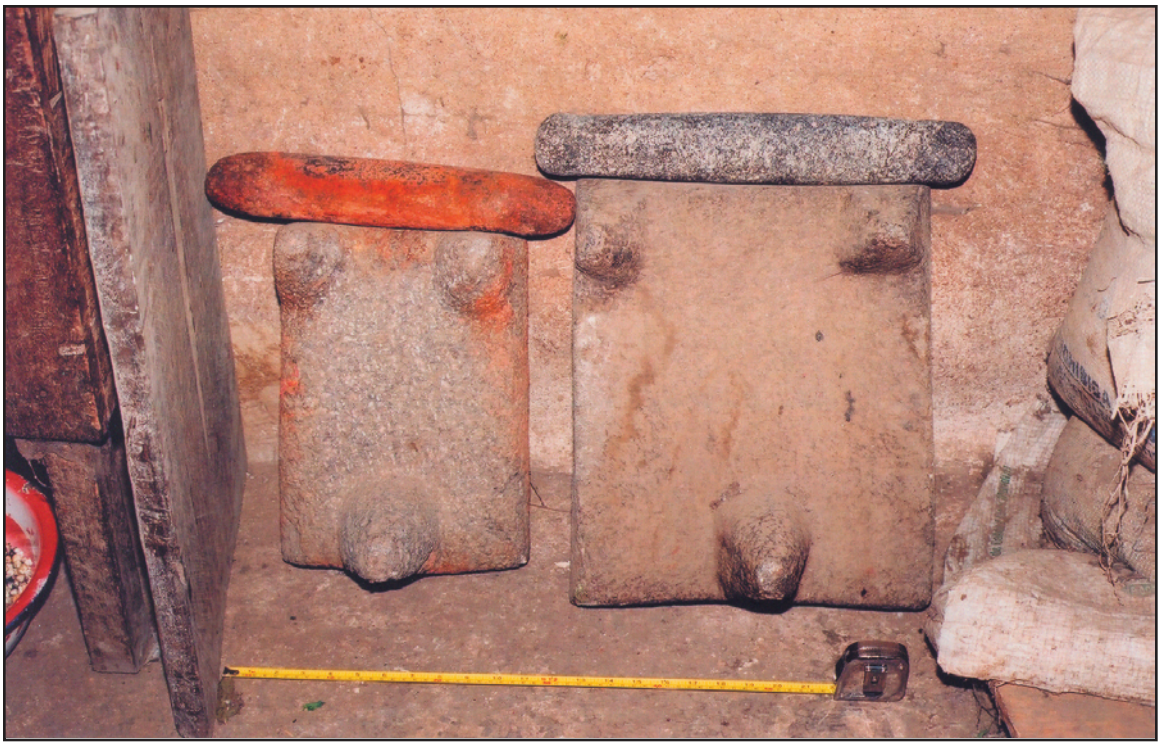


Figure 5.15. Western style metates stored next to a wall in the kitchen.

Figure 5.16. Body position in which K'iche' women grind on their manos and metates.

Artifact Assemblage and Structure of Highland Mayan Kitchens

The process of grinding corn involves much more than just the mano, metate, and nixtamal. Usually, women have a container of water nearby (Figure 5.17). The water is added to the nixtamal as it is being ground into masa. Water gives masa the consistency needed to pat out tortillas without them crumbling or cracking. The nixtamal is usually stored in a container that is located very close to the mano and metate. Many of the Q'eqchi' place their pots of nixtamal directly under the table where the metate(s) rests (Figures 5.18 a-c). The nixtamal is located close to the metate in order to facilitate easy access during grinding. If more nixtamal is needed, it is simply retrieved from the pot or container located under the metate.

Figure 5.17. Romelia Ca'al in grinding motion. The container next to the metate holds water that is put on the nixtamal while it is being ground.

A

B

C

Figure 5.18 a-c. Containers of nixtamal that are stored under tables where metates are used.

Another significant aspect of metate location in Q'eqchi' homes is their proximity to the hearth. Figures 5.19 a-b show that the location of the metates are about one to three meters from the hearth, where tortillas and other foods are cooked. The metates are likely placed close to the hearths for convenience. I described in Chapter 4 how some women will grind out a small ball of masa during the fine-grind, they pat out one tortilla, place it

A

B

Figure 5.19 a-b. In Q'eqchi' homes, the metate is placed close to the hearth.

on the comal, and return to the metate to grind out enough dough for another tortilla. This action would take longer if the metate and hearth were on opposite sides of the room, so the Q'eqchi' place the metate close to the fire for convenience.

Although information was not recorded on the number of rooms found in each home or how the rest of the house was constructed, it is common practice for the Q'eqchi' and K'iche' to build dwellings with kitchens separated from the rest of the house. In some cases, the kitchen is a separate building, and in other homes, it shares a wall with the rest of the house. Kitchens that are separated from the rest of the structure are important because they were also observed at the site of Cerén. The kitchens at this ancient Mayan site were identified by some of the same features found in modern Mayan homes, such as the presence of manos and metates, food products, and a hearth.

Reinterpretation of the Location of Grinding Stones at Cerén

The purpose of recording the location of manos and metates in the homes of the modern Maya was to use this information to determine whether these patterns were evident in ancient Mayan houses. Cerén is a good site to compare to modern Mayan artifact locations because it was preserved in a state that most likely resembles the actual use-location of artifacts before the site was abandoned and covered in volcanic debris.

Two of the structures excavated at Cerén were identified as kitchens. Structure 11 is one of these kitchens and is located within the group of buildings that make up Household 1. Its artifact assemblage includes many ceramic vessels, bone and obsidian tools, three manos, and two metates. One of the metates was found on the floor next to a vessel that contained maize kernels (Figure 5.20). Sheets (2002a:148) says this corn was most likely being soaked overnight to be ground the next day. Figures 5.18 a-c show containers of nixtamal in the homes the Q'eqchi'. These pots, containing soaked maize, are also stored very close to the metate.

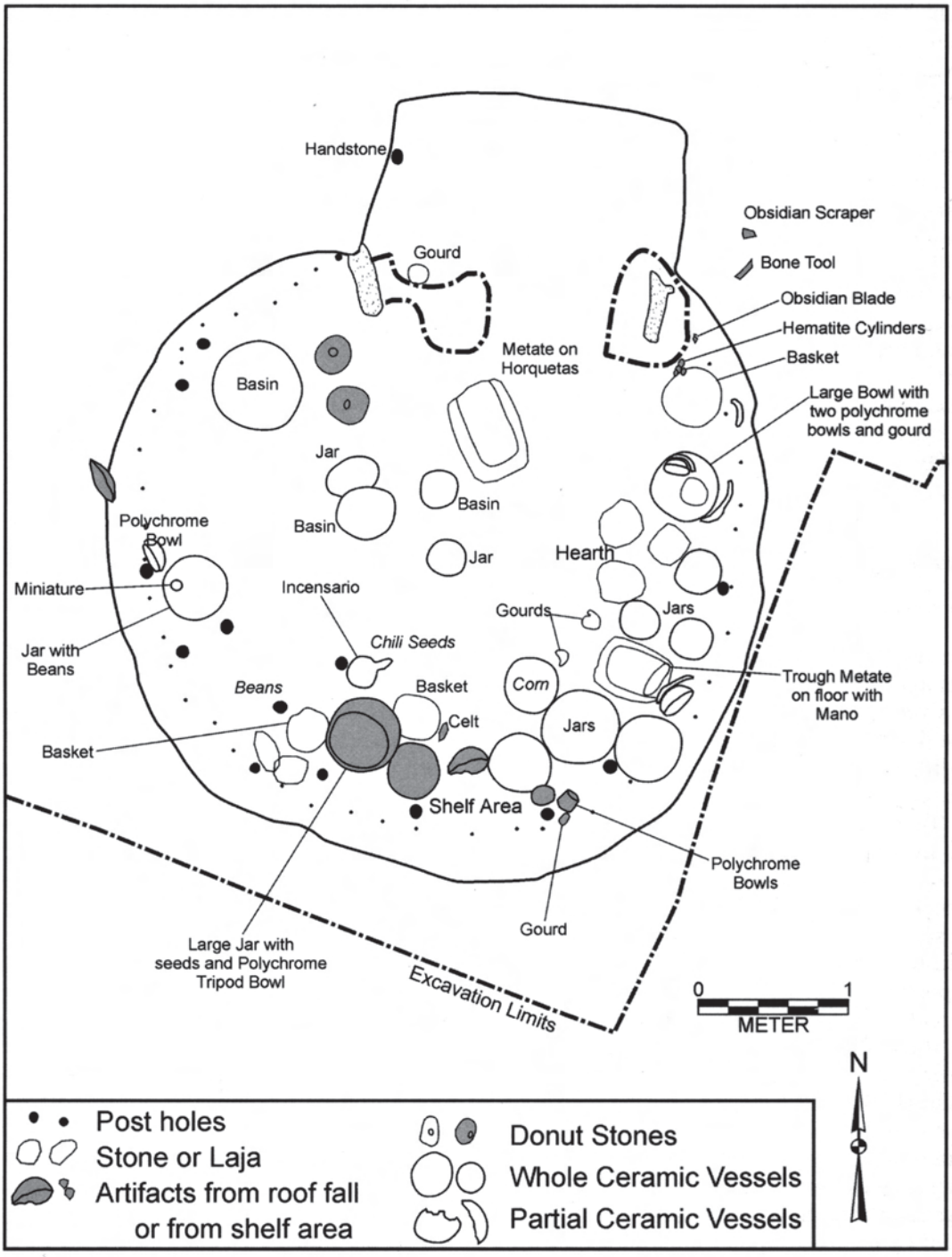


Figure 5.20. Map of Structure 11 at Cerén, El Salvador [Sheets 2002:52, Figure 5.4].

Sheets (2002a:148) also says that the metate on the floor was the most used, exhibiting a deep trough that had almost been worn through. Its location, approximately 20 cm away from the hearth, suggests that it was used often during the daily processing

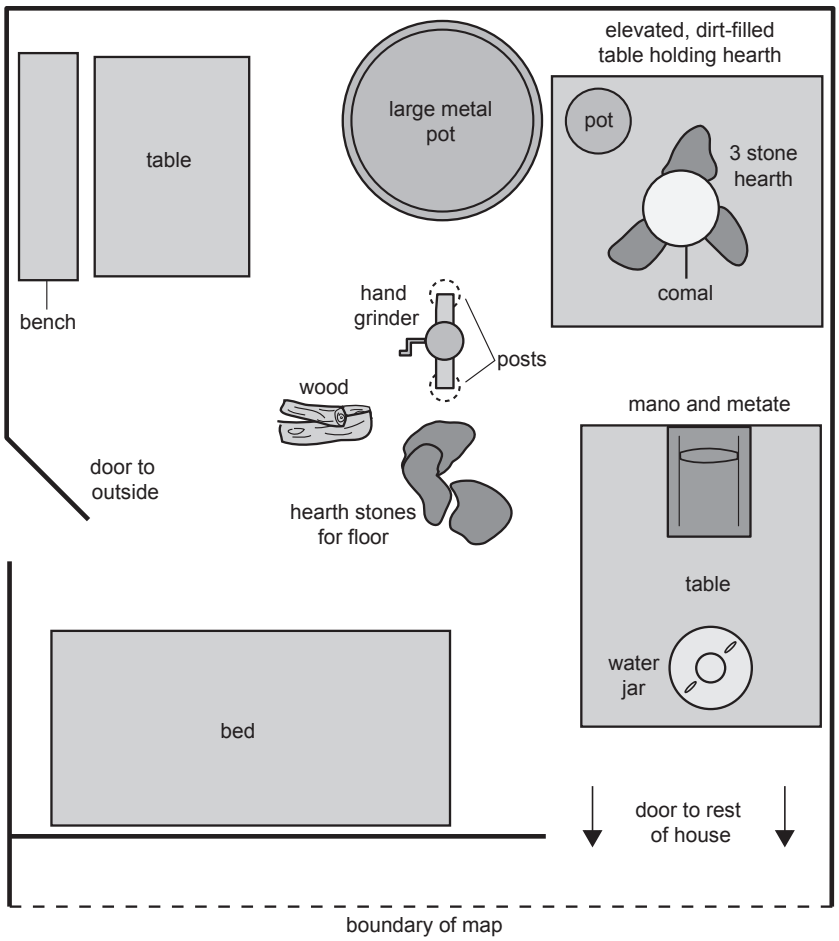


Figure 5.21. Kitchen of house CHI-007, plan map.

and cooking of foods. The maps of homes among the Q'eqchi' (Figures 5.21, 5.22, 5.23) also show that close proximity of the hearth to the metate use-area is very common. Many of the Q'eqchi' homes visited possessed this same characteristic.

In Structure 11 at Cerén, another metate was located about one meter northwest from the hearth (Figure 5.20). This metate was supported by *horquetas*, or forked sticks that elevate the metate off the floor. As stated, elevating metates is quite common among the Q'eqchi' (Figures 5.12, 5.13, and 5.14). They typically use a table for the distal legs and a post for the proximal leg. This raises the metate up so the woman using it can stand while grinding (see DVD chapter, "Grinding with the K'ekchi"). I observed the use of

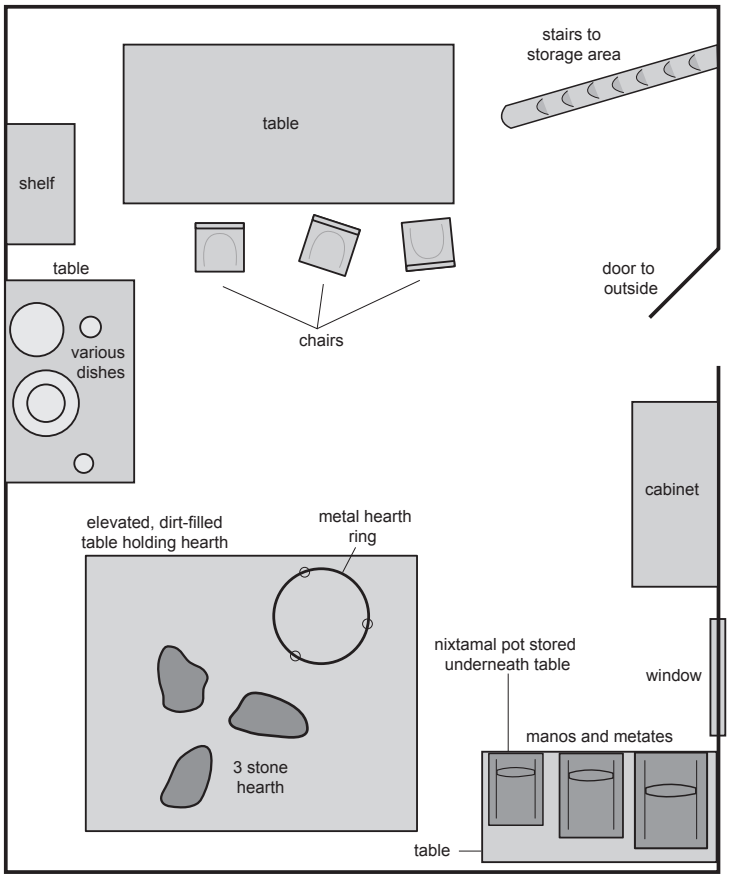


Figure 5.22. Kitchen of house CHI-034, plan map.

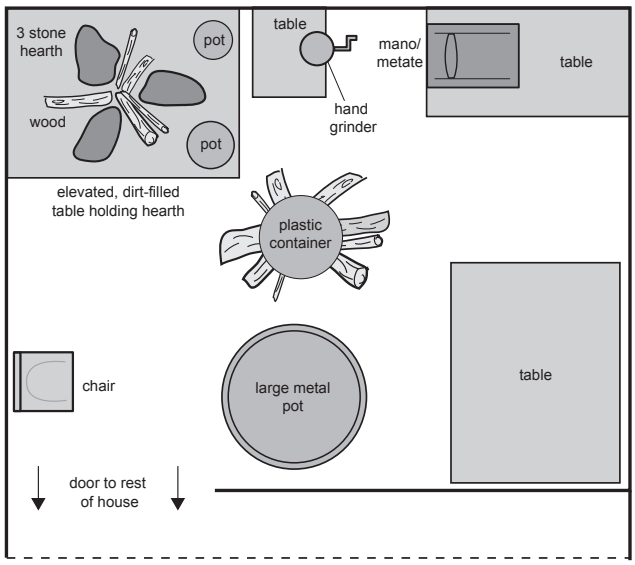


Figure 5.23. Kitchen of house PAN-007, plan map.

forked sticks, or *horquetas*, in the town of San Luis Jilotepeque (Figures 5.24 a-b). The Pokomam inhabit this region (Figure 3.1). I found other people there using *horquetas* to raise their metates to a preferred level, as well.

The use of *horquetas* may not always be evident among dwellings that were abandoned over time, but post holes that may not be related to the structure of a domicile

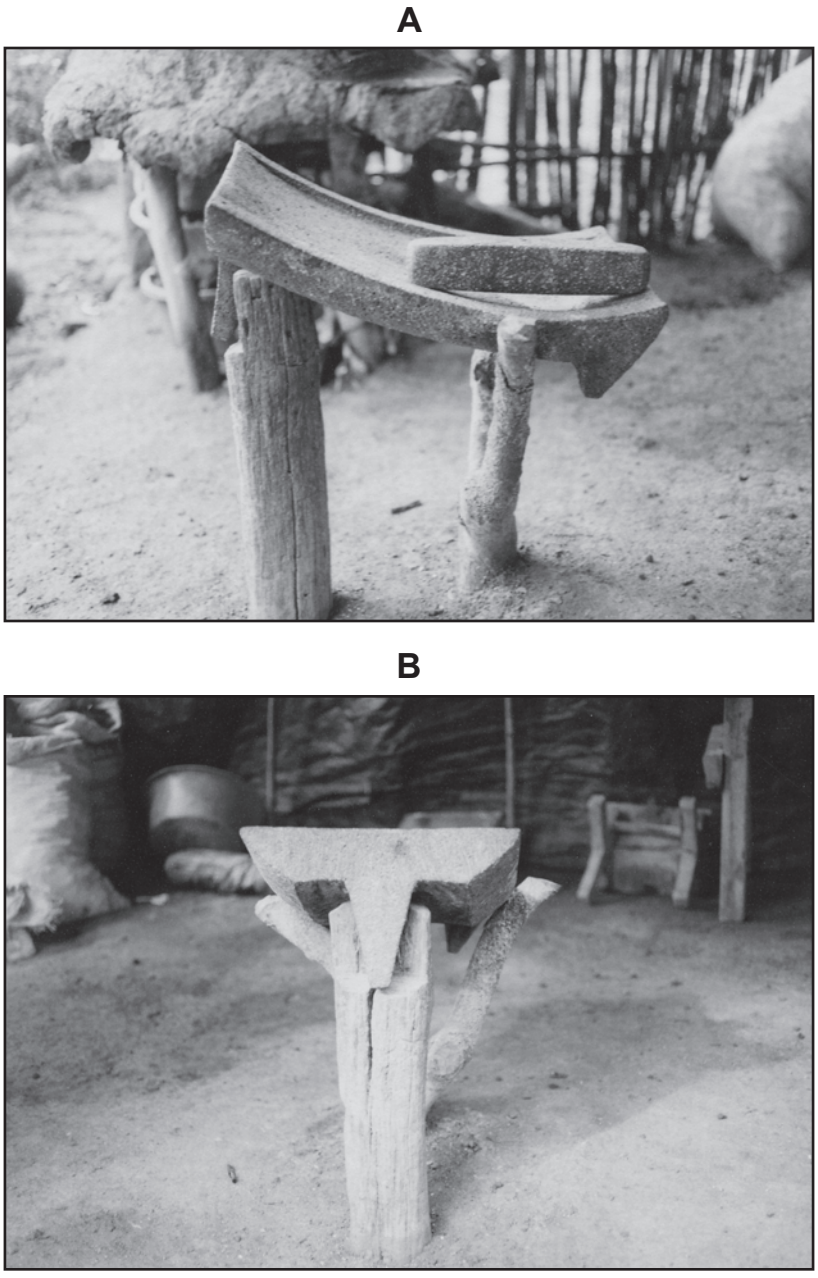


Figure 5.24 a-b. A metate on *horquetas* in the home of a Pokomam metatero.

may suggest the use of *horquetas* in order to elevate a metate. This interpretation may also be strengthened if the *horqueta* holes are located close to the hearth.

In Structure 11 at Cerén, there were also two basin vessels, one with handles, and two jars with high necks near the metate on *horquetas*. Beaudry-Corbett et al. (2002:53) suggest the jars were used to hold water. The water was most likely used while grinding maize. I observed both K'iche' and Q'eqchi' women using water from a container located near the metate to wet the nixtamal as it was being ground into masa. They would also use water to wet their hands when patting out tortillas so the masa would stick together and not crack while being formed into a tortilla (see DVD chapter, "Grinding with the Q'eqchi'" and "Grinding with the K'iche"). I propose that while the jars may have held water, the basin vessels may have been filled with water to be used while grinding and making tortillas. The necks of the jars would have made it too difficult to use the water unless it was poured onto the hands.

Structure 16 of Household 3 was also designated as a kitchen at Cerén. It contained a metate elevated to about 45 cm from the floor on rocks. Below the metate was a stone that was set into the floor. Calvin (2002:72) thought it may have been a foot brace. I found in my research that a rock or wooden step would be placed on the floor below the metate to facilitate women who may have been too short to be able to grind at a comfortable level. Figure 5.25 shows Amalia Che of Chicojl using a small stone to elevate herself so she is high enough to use the upper portion of her body while grinding. The stone or step can be moved for those who are tall enough, but in other homes, the step is set into the ground permanently.

Metate Size as an Indicator of Function

Gayel Horsfall (1987:352) said that there is little ethnographic information about "the possible relationship between grinding stone size and function." Horsfall

Figure 5.25. Amalia Che of Chicojl using a small stone to elevate her body to the level of the metate.

(1987:350-351) analyzed this relationship by comparing the function of metates to their grinding surface area. Data for her study came from metates of San Mateo Ixtatan, Huehuetenango, Guatemala. She found that metates with an average surface area of 1140 cm^2 were used to grind corn. Metates that were used for special purposes, such as grinding coffee, salt, herbs, and calcite, had an average surface area of about 744 cm^2 (Surface area was calculated by multiplying the length by the width of the dorsal or grinding surface of the metate).

During my research, I noticed that four principal foods are ground on manos and metates among the Western and Eastern styles: corn, coffee, chile, and achiote. The

Figure 5.26. Three Western style metates used to process different foods.

K'iche' usually dedicate one metate to each of three functions: corn grinding, coffee grinding, and chile/achiote grinding (Figure 5.26). The Q'eqchi' sometimes use different metates for corn and coffee, but chile and achiote are usually ground on the same metate that is used for the processing of corn. I collected measurements of manos and metates and used them to determine whether a correlation exists between sizes of metates and the types of materials ground on these different sizes.

I recorded 115 metates that had an assigned function. The mean surface area of the 115 metates was 1441.14 cm^2 (Figure 5.27). Table 5.3 shows the average surface area for metates used for corn, coffee, and chile or achiote. Figure 5.28 is a scatter-plot showing the distribution of these metates by surface area. They are labeled according to function. My first observation was that the metates dedicated to the grinding of achiote

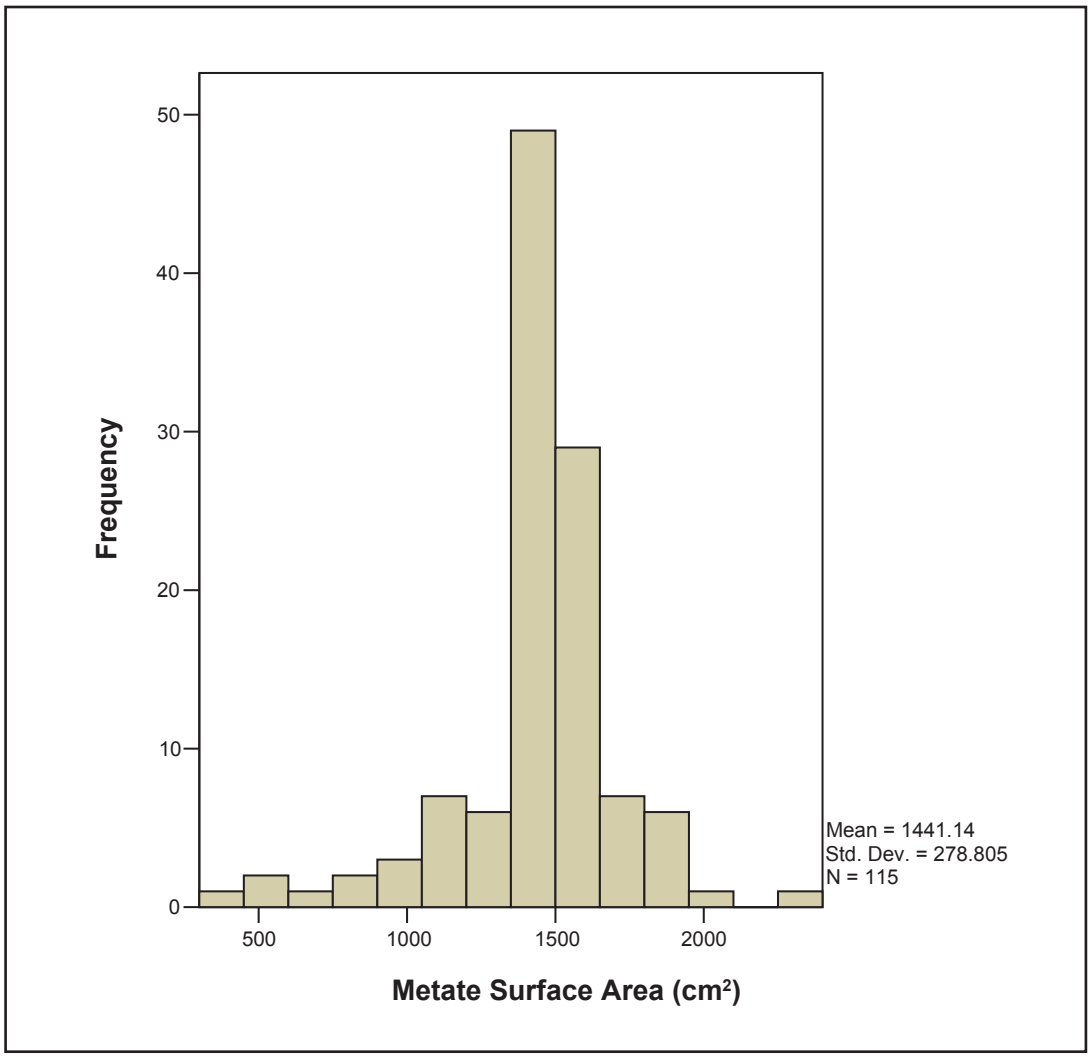


Figure 5.27. Distribution of the surface area of 115 metates recorded with a designated function.

Table 5.3. Average surface area for metates according to function.

	Surface area average (cm^2)	Range	# of cases
Chile and achiote	755	403-1643	6
Coffee	1473	816-2337	12
Corn	1480	962-1950	97
		TOTAL	115

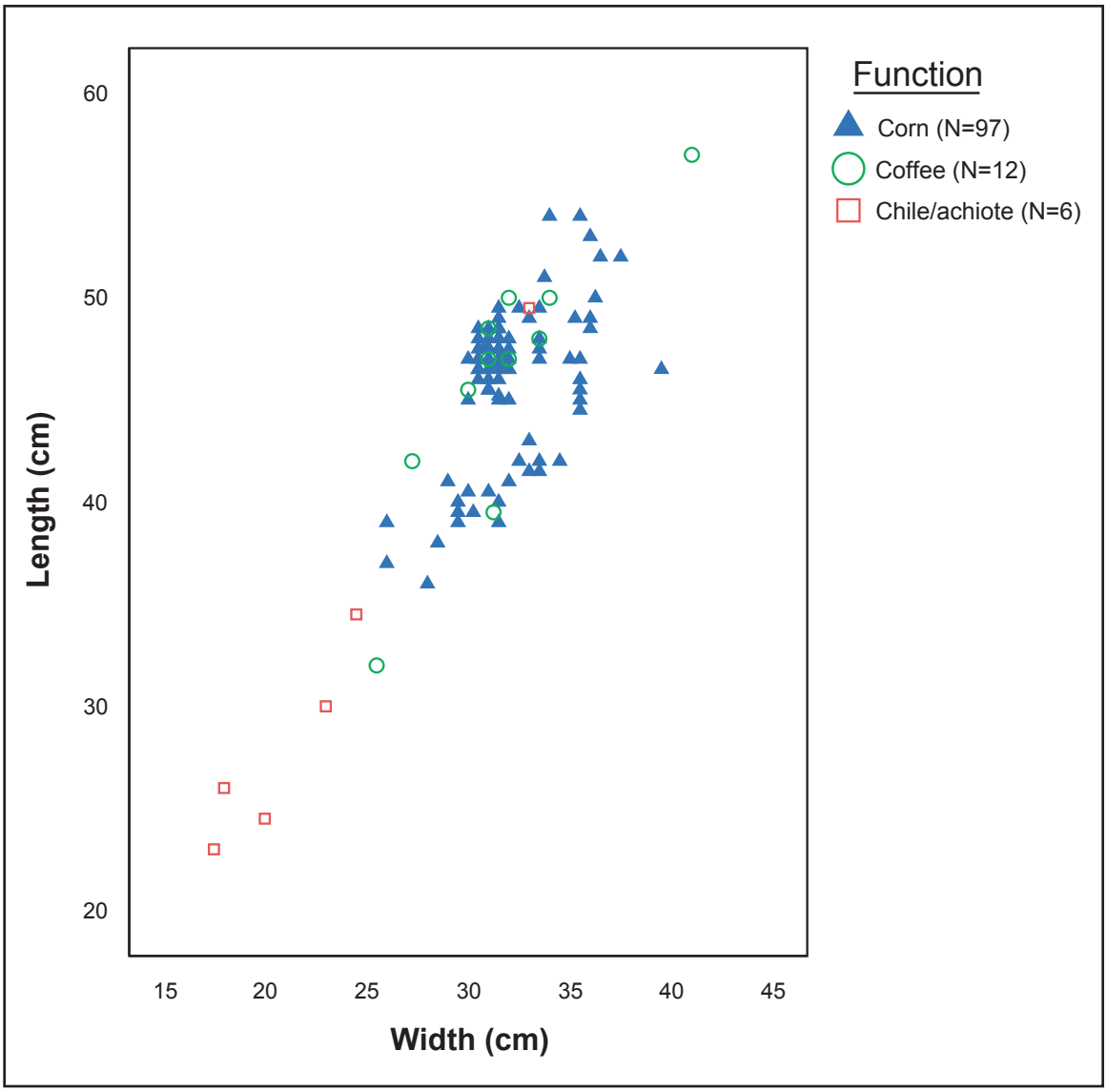


Figure 5.28. Distribution of metates by surface area and function.

and chile fall into the lower end of the size scale. The average surface area of chile and achiote metates is 755 cm^2. This is very similar to Horsfall's 744 cm^2 average surface area for special purpose metates.

I also observed that when chile, achiote, or other items were ground, they were only needed in small quantities. In other words, a small metate would accommodate the items ground in small amounts. A little handful of *chiltepe* (a small chile seed eaten in Guatemala) or achiote seeds are often ground on these small metates. Chile is commonly

used as a condiment and is eaten with tortillas, beans, or other foods. Achiote is a spice that adds flavor and a rich red color to soups. The deep red residue of achiote is easily recognizable on metates that have been used to grind this spice (Figure 5.29).

The graph in Figure 5.28 also shows the distribution of metates used for coffee and corn. Corn is represented by a tighter cluster of points than those for coffee, which may suggest that metates used for corn are manufactured at a standardized size and for the express purpose of grinding maize. On the contrary, the points representing metates used for coffee show two far outliers on either end of the scale (Figure 5.28). If these outliers were not included in the analysis, it is clear that metates used for coffee are generally the same size as those used for corn.

Coffee was brought to the Mesoamerican region after the Conquest and is farmed as a cash crop. After being roasted, coffee is ground and combined with water. Naturally, when coffee was introduced into the Mesoamerican diet, people used their manos and

Figure 5.29. Western style metate covered in achiote residue.

metates to process the seeds. I feel that people in colonial times initially used metates that were originally produced for grinding corn to process coffee. Therefore, there is a trend today in which metates used for grinding coffee have approximately the same surface area as those used for maize grinding. Essentially, they are the same sized metate, but with a new use.

Horsfall (1987:352) also mentioned that archaeological literature "contains a number of references to at least two size classes of grinding stones." The data in my research on metates used by the Q'eqchi' and K'iche' show that two predominant sizes of metates are used. The analysis of data described above shows that there is a positive relationship between metate size and function. As indicated by both my data and that of Horsfall (1987), metates with a smaller surface area are used to grind foods such as chile, achiote, salt, herbs, and other items that are usually only needed in small quantities. Metates with a larger surface area are generally used for grinding coffee and corn. The relationship between metate size and function described above is a valuable analogy that can be used to interpret metate collections from archaeological excavations.

Summary

The archaeological implications described in this chapter cover many aspects of manos and metates. I began by showing how observing the modern use of grinding stones helps to understand wear patterns, such as the identification of two-sided manos used by the Q'eqchi'. Cultural beliefs and traditions, like multigenerational use and *awas* beliefs shared by the Q'eqchi' and K'iche', were also described. I also explained how the number of metates in a house could indicate the economic status of those who occupy it. A comparison of use-locations between the ancient site of Cerén and modern Mayan homes showed that many similarities exist, including the proximity of metates to the hearth, metates elevated for use while standing, and the proximity of vessels to

metates that contain water or nixtamal. Last, I concluded that the function of a metate can be determined by the size of its grinding surface. Those that have a large grinding surface are typically used to grind maize, while metates with a small grinding surface are dedicated to the grinding of condiments such as achiote and chile.

6 Ethnographic Implications and Conclusions

Introduction

In addition to the archaeological implications of this project, my study of manos and metates has resulted in valuable ethnographic data. This chapter synthesizes the ethnographic information I collected during fieldwork, and which appears in the tables of Appendix B. I discuss the importance of metates in Mayan homes, gender roles represented by tools, and how traditional customs are being lost as communities "develop." The implications of *awas* among the Q'eqchi' and K'iche' are also explained in relation to manos and metates. I conclude by summarizing the analyses of the research reported in this thesis and how it contributes to the interpretation of manos and metates found in the archaeological record.

No Metate, No Food

When I asked about the importance of manos and metates, many Q'eqchi' answered, sometimes in perfect sync, "*mac'a' li ca', mac'a' li cua*," or "no metate, no food/tortillas." Even the K'iche', who do not use their metates as often as the Q'eqchi', know that if the community mill breaks down, or if there is no electricity to run it, they need metates to grind their corn for their "daily bread." Although many of the K'iche' interviewees said they do not use manos and metates for grinding corn, they explained that grinding stones are important for other reasons. Ana Tzep Tzikin said they need them

for making foods such as *horchata* (a sweet rice drink) and *jo'com* (chile and achiote sauce).

Rosa Ca'al said, "If we have no metate, we wouldn't eat. It is the woman's work to get up early every morning before the sun rises. We start the fire, clean the nixtamal, and grind the corn. It provides us with food."

Other people also said that the metate gives or provides them with their food. When I was told that without the metate there would be no food, it seemed as though the people deemed the metate just as essential as the food. In other words, the maize would be useless unless it was processed on a grinding stone. Carmen Chub of Pantoc expressed her opinion on the importance of the metate this way: "The metate is the reason we are alive."

One of the questions that sometimes confused my informants was, "If you were to leave your house because of an emergency, would you take your mano(s) and metate(s) and why?" Many people did not understand the question, so they often did not answer, but those who did reply helped me to understand the importance of the metate in relation to other items in the house. For example, at times I asked this question, and they answered "yes;" I would then ask, "What would you take next?" Most of the women said they would then take their metal pots and dishes, followed by their clothes. Jose Can Chol said, "It (the metate) is an inheritance. The metate is the most important thing, even though there are other jobs to be done. Grinding is the most important because it gives us our food."

Gender Roles and Metates

One question I asked during my interviews was whether men can use manos and metates. As stated in Chapter 4, most people said that men could not use the metate to grind. I would follow by asking "why?" I received a number of different answers that

distinguished distinct labor roles between men and women. In addition, I realized that a difference existed between those who believe that men are prohibited from using grinding stones (K'iche') and those who felt men could use them on occasion (Q'eqchi').

The division of labor between Maya men and women is well-known. Men spend much of their time working out of the house. Their responsibilities related to maize agriculture lie in preparing the fields by slashing overgrowth, burning the brush after it dries, sowing maize, weeding, and harvesting corn. Many Q'eqchi' men are also employed by local plantations where they cultivate coffee and cardamom. Women work principally in the home. Their responsibilities include food production and processing, tending to animals, and maintaining household gardens. Wilson (1995:41) found that Q'eqchi' women are the dominant decision-makers when dealing with household consumption.

I also noticed that certain tools are related to gender identity. Interviewees, both male and female, recognized the metate as a woman's tool – "(metates) are the material of the woman." One informant said that the man's tools are the hoe and the machete and that men's work is in the fields; woman's work is in the kitchen. Together, the efforts of both men and women are complementary and equally important. Without men working to cultivate corn, there would be no food for the women to make. If the food is not made by women, men would not have the nourishment they need to work the fields.

Between the Q'eqchi' and K'iche' I found major differences about metate use. The K'iche' consider the use of metates by men prohibited. As described in Chapter 4, it is an *awas* if men touch a metate after a woman has ground on it. The consequence of this action results in the man only producing female offspring. Understanding the need to have sons that can help with work in the fields, I found that this *awas* was taken very seriously by men of Ixtahuacán. Pascual Tambriz, a man in his mid-twenties, reported he had never touched a metate in his life. Part of the reason why he avoided handling the

grinding stones was the consequences of the *awas*. Pascual also mentioned that metate avoidance was out of respect for women. Recognizing that the metate is the woman's tool, not touching it demonstrates the respect some men have for women and their role in consumption. Even if a woman is sick, K'iche' men will either pay another woman to come and grind their corn or they will buy tortillas from someone else. I was also told that a female relative can come to the house to tend to the family's consumption needs until the woman recovers.

The most common Q'eqchi' answer for why men cannot use the metate was because they do not know how. Wilson (1995:41) also noted that Q'eqchi' men readily admit to being ignorant when it comes to the preparation of tortillas. He says that men highly value the role women take in the making of tortillas. Q'eqchi' men say they would die without women (Wilson 1995:41). But, the Q'eqchi' I spoke with also said it was permissible for men to use metates. Unlike the K'iche', the Q'eqchi' do not have an *awas* associated with men using metates. In some cases, I was informed that Q'eqchi' men can use metates when women are too sick to grind.

While most men do not use manos and metates, many Q'eqchi' women told me that men *often* use the hand-grinder. I was allowed to grind using a hand-grinder and realized soon after the first few cranks that my endurance would not last as long as I thought. The constant motions of turning a crank that is stiff from resistance caused my arms to burn with fatigue. Although it can provide some relief from the rigors of grinding nixtamal on a metate, hand-grinders require major amounts of energy to process corn. Q'eqchi' men can participate in grinding with a hand-grinder, whereas most of the K'iche' did not own hand-grinders.

This information shows how metates represent the role of the woman in Mayan culture, just as men are represented by their tools. I also found that different labor roles of men and women are considered equally important for daily survival. Also, the Q'eqchi'

see the use of metates by men as permissible in certain situations, whereas the K'iche' identify this behavior as prohibited. Both Q'eqchi' and K'iche' men recognize the importance of women in producing food for consumption. Men rely on women to process food suitable for eating, and women rely on men to produce the food they process.

Economic Development and the Loss of Cultural Traditions

Before beginning my 2004 field season in Guatemala, I decided to choose three communities where I would conduct interviews. As described in Chapter 3, I chose communities that I felt represented three different levels of economic development. Pantoc, Chicojl, and Ixtahuacán each possess certain characteristics that identify them as being at a certain level of development, technologically and economically.

Pantoc is a village and is the smallest of the three communities. It lacks electricity, a market, and a Catholic church, which are all characteristics of towns. Chicojl represents a village that is transitioning into a town. Electricity was recently brought into the community, but it still lacks running water. A major road cuts through the middle of the Chicojl and provides access to tourists who frequent natural attractions in Lanquin. This road is in the process of being paved and will likely result in increased tourist traffic. The most developed of the three communities is Santa Catarina Ixtahuacán. It is an established town with a market, central Catholic Church, electricity, and running water. The town center has three grinding mills from which people can choose to take their nixtamal to be ground.

At the beginning of my research, I noticed that people who live farther away from towns and municipalities use their metates much more often than those who live *in* the towns. Those who live out and away from town centers do not have the same facilities and resources as those who live within town boundaries. In other words, there are more mills available in towns where people can take their corn to be processed. On average,

people who live farther away from town centers are at a lower economic status, like those surveyed in Pantoc.

Pantoc has only one mill. I was told the prices for grinding there are very high. People in Pantoc use their metates every day, and I found a few women there that rarely go to the mill to have their maize processed. They will either grind nixtamal using their hand-grinders (then pass the masa to the metate for a fine grind), or they will grind their corn all three times on their metates.

I surveyed people at the highest economic level in Ixtahuacán. Most people there only use their metates for special foods or if the mill does not properly grind the nixtamal. Metates are stored propped up on walls until the need to grind arises. It seems that the time (or sleep) they gain by avoiding the use of metates is more important than the cultural tradition of using them. Extra time can be dedicated to other activities such as chores and craft work, resulting in goods that can be sold. Additional daily time can be a significant factor in promoting this kind of change in the traditional use of utilitarian tools.

I believe that economic development has contributed to the abandonment of traditions. As villages continue to grow more prosperous and connected, they begin to rely on technology that helps to reduce the amount of time required to perform specific tasks, such as preparing food. As observed in Ixtahuacán, most people rely on the community mill for their maize grinding needs.

Implications of *Awas*

Many of the taboos described in Chapter 4 associated with manos and metates require the woman using them to take precautions while grinding. There are rules that govern the handling of grinding stones by men, as well. Wilson (1995:124) described *awas* manifesting itself as "an inherent malformation of the victim's constitution, the

causal agent of which is unknown or not clearly identified." He clarified that *awas* appeared in people as a "major category of illness" (Wilson 1995:125). Wilson did not detail any *awas* related to inanimate objects. The Q'eqchi' and K'iche' who participated in my interviews explained that the *awas* could effect both people and objects, or in this case, grinding stones.

I agree with Wilson that the "causal agent" for illness in people is unknown. In the case of the mountain *awas*, the cause for any malady or misfortune is the mountain spirit, or *tzuultaq'a* (Wilson 1995:124). Certain actions taken during the planting of corn can result in the *tzuultaq'a* causing illness in the person who disobeyed any number of rules, such as engaging in sexual intercourse on the day of planting (Wilson 1995:116). But the agent or power that enforces the *awas* is ambiguous at best.

Manos and metates may hold their own power to afflict physical malady in humans. As stated, the K'iche' believe that men or women who sit on the proximal leg of the metate while the metate is resting against a wall will only produce offspring of the opposite sex. This same consequence occurs when someone walks over the metate when it is on the floor. The manipulative power of grinding stones over human reproduction guides both men and women to handle them with respect and reinforces their important role in the daily consumption of corn.

Many of the consequences of an *awas* are that the mano or metate can break, taking away the ability to process corn and produce the day's sustenance. The breaking of a mano or metate may indicate that they have the ability to manipulate themselves, even possessing spiritual qualities that give them this control. The power that a mano and metate hold may be indicative of why people bury them around their homes after they break. The notion that grinding stones may possess a power is speculative and will need to be verified during future fieldwork.

Observations concerning the influence of manos and metates and the respect

they command contribute to their importance in the homes of Mayans. Just as reverence and respect is shown towards maize, the metate may be equally revered for its role in producing food from sacred corn.

Project Conclusions

Among the contemporary Maya, ceramic vessels have been replaced by metal pots and plastic containers. Metal knives and machetes have taken the place of stone tools, such as obsidian and chert blades. Having the opportunity to study a tool that is still being produced and used today much in the same way as it was used in pre-Columbian times provides rich analogies for archaeologists to use in the interpretation of manos and metates.

The ethnographic study of manos and metates contained in this thesis adds to the few existing studies reviewed earlier (Clark 1988; Cook 1982; Dary and Esquivel 1991; Garcia Chavez 2002; Hayden 1987a, 1987b; Nelson 1987a, 1987b). New information on the production of manos and metates includes the characteristics of work areas within metate quarries and work performed in home workshops. I also described how fathers pass down the art of making manos and metates to their sons. Families are considered "metatero families" (Manuel Guachiac, personal communication 2003). This patrilineal line of craftsmen demonstrates how families of ancient Mesoamerica may have been identified by the goods they produced.

Grinding stones continue to play an important role in the lives of contemporary Maya (see Appendix B, Table 3), and they were likely used more often by the ancient Maya. Women, even 50 years ago, would dedicate enormous amounts of time to processing corn each day, and this made the metate an indispensable tool. I estimated that 56 minutes would be dedicated to the processing and cooking of enough tortillas to feed one person per day if only the mano and metate were used to grind corn. This estimate

helps to highlight the important role women played in the daily consumption of a family before the advent of gas- or electric-driven mills.

The information on discard shows that broken manos and metates were usually thrown or buried outside of the structure where they were used. This helps to identify manos and metates located outside of structures of ancient sites as once belonging to the material assemblage of the associated structure. In addition, my analysis of recycling habits serves as an analogy for how people recycled manos and metates for other uses prehistorically.

My research also provides new ways to interpret wear patterns on grinding stones. Information presented in Chapter 5 includes ways to calculate attrition on Eastern style manos as well as determining whether the Eastern style mano had two grinding surfaces used for rough and fine grinds. I also described how some Western style manos exhibit different grinding surfaces and how the wear patterns on these manos appear due to the actions of the woman grinding with the mano over time (Figure 5.8).

Another contribution of this thesis is determining that people with a lower economic status generally own fewer metates. The number of metates found in a domestic dwelling may help in distinguishing between levels of status in ancient contexts. Further study on the number of metates in Mesoamerican houses will help to clarify whether this analogy can be applied effectively.

In addition, I showed that understanding the discard and use-location of modern metates can help in interpreting metates found in the archaeological record. Metate use-location can also help to determine the function of ceramic vessels and other items associated with metates used by pre-Columbian peoples. Future research and analysis on the number of rooms or the size of the structures where manos and metates are found may help in creating better indicators of economic status. In turn, this will help determine whether there is a correlation between ancient and modern situations.

The analysis of metate size as an indicator of function resulted in a positive correlation between smaller metates as being used for the grinding of spices and other condiments. This analysis also showed that larger metates are dedicated to grinding coffee and maize. I also explained how metates used for coffee are essentially the same size as those used for grinding maize.

Finally, this study contributes to a better understanding of the modern Maya's material world. I explained how metates may be considered as important as maize. Without grinding stones, people said they would not eat. In addition, the metate is an extension of womanhood, and its use is reserved for women in Mayan culture. The use of metates by men among the K'iche' results in adverse consequences, such as the impossibility of producing male offspring.

Another ethnographic implication explained above is the loss of traditions due to economic development. As communities progress economically, they tend to rely on technology more, and this results in the abandonment of traditional methods such as the use of manos and metates.

The way in which the *awas* guides the use of manos and metates was also described above. *Awas* associated with grinding stones are an indicator of the power and importance they possess. People must obey strict rules that show respect to these tools that can prevent harm to manos and metates or a person's own health.

All of these contributions are intended to help archaeologists better interpret manos and metates found archaeologically. If applied to grinding stone collections from excavations of pre-Hispanic sites, observations from my study can aid in the identification of features, wear patterns, and other important information and help paint a fuller picture of manos and metates used in the past.

Because the use and production of manos and metates is diminishing, the likelihood that these tools will be abandoned by the Maya within ten years is high

(John Clark, personal communication 2005). This is another reason why a study on the contemporary use of manos and metates is so valuable. In addition to understanding the use and production of modern grinding stones, this project has preserved useful descriptions of some of the traditions and customs of the Maya that may not persist into the near future.

APPENDIX A
Questionnaire

FORM A – Field Survey
Mayan Metate Ethnoarchaeology

_____ _____ _____ _____
Community - house # - metate # - mano #

_____ _____
- metate # - mano #

_____ _____
- metate # - mano #

Questionnaire

1. How many manos and metates do you have (currently)? Manos_____Metates_____

2. How long have you had them? _____

3. How many manos _____and metates_____ have you acquired in your lifetime(s)?

4. When did you acquire them? (Age?)

5. Did you buy them or were they given to you?

6. From whom did you acquire the grinding implement(s)?

7. How much did the mano(s) and metate(s) cost (estimated value)?

8. What was a day's labor at that time?

9. How often do you use your mano and metate?

10. When do you use them?

11. Are there times that you are prohibited from using them?

12. How many people use the mano(s) and metate(s)?

13. Who uses them?

14. Can men use them?

15. What are your mano(s) and metate(s) used for?

16. Are there any uses that do not involve grinding?

17. Where do you use your mano(s) and metate(s)?

18. Are there any places you should ***not*** use them?

19. What have you done with your broken or old manos and metates?

20. Have you used them for other purposes? (Are there any available that are being reused or have been discarded currently around the house that I can look at?)

21. How far is the nearest *molino*?

22. How often do you go there to grind your corn?

23. Do you own a hand-grinder?

24. How often do you use it?

25. Do you always regrind the masa on a metate after the nixtamal has initially been ground at the molino?

26. How often do you resurface your metate?

27. Why do you use (or not use) a metate?

28. Have you ever been without a mano and metate?

29.How would you (or did you) feel without them?

30. Are manos and metates used in any rituals?

31. How did men and women come to have corn?

32. How did men and women come to have manos and metates?

33. Can anything bad happen if manos or metates are used incorrectly?

34. What do you feel about having and using a metate? Why?

35. Would you rather have an old one or a new one? Why?

36. If you were to leave your house because of an emergency, would you take your mano(s) and metate(s)? Why?

37. Is there something else I should know about manos or metates that I have not asked about?

Household Information

1. How many people live in your house? _____

2. Who lives here?

3. What is their relationship to you?

Person interviewed _____ Language _____

House Construction/Economic Indicators

Walls:	**Roof:**	**Floor:**
___bricks	___concrete roof	___ceramic tile
___block	___duralitas	___painted cement
___rock/cement	___lamina/corrugated metal	___cement
___adobe with plaster	___tejas/tiles	___wood
___adobe without plaster	___paja/thatch	___brick (clay)
___wood	___other _____	___dirt
___bajareque		___other _____
___cane		
___other _____		

Misc. Data to be Recorded:

- Cost of mano and metate (all sizes, wholesale/retail)

- Cost of a cooking pot_____water jar_____

- Cost of hand-grinder

- Cost of molino (according to community)

FORM B - Mano and Metate Record Sheet

Mayan Metate Ethnoarchaeology

METATES

Metate #1: Type _____ Age _____ Photo (roll - #)_____ - _____

Size: _____ / _____ : _____ / _____

l x w x h proximal distal basin l x w

leg height

Stone type: _____ / _____

English Native name

Physical Description:

_____

_____

_____

_____

_____

History/uses:

_____

_____

_____

_____

_____

Metate #2: Type _____ Age _____ Photo (roll - #)_____ - _____

Size: _____ / _____ : _____ / _____

l x w x h proximal distal basin l x w

leg height

Stone type: _____ / _____

English Native name

Physical Description:

_____

_____

_____

_____

_____

History/uses:

_____

_____

_____

_____

_____

Metate #3: Type _____ Age _____ Photo (roll - #)_____ - _____

Size: _____ / _____ : _____ / _____

l x w x h proximal distal basin l x w

leg height

Stone type: _____ / _____

English Native name

Physical Description:

_____

_____

_____

_____

_____

History/uses:

_____

_____

_____

_____

_____

MANOS

Mano #1: Type _____ Age _____

Size: _____ / _____

length width

Stone type: _____ / _____

English Native name

Photo (roll - #)_____ - _____

curvature

Physical Description:

_____

_____

_____

_____

_____

History/uses:

_____

_____

_____

_____

_____

Mano #2: Type _____ Age _____

Size: _____ / _____
length width

Stone type: _____ / _____
English Native name

Photo (roll - #)_____ - _____

curvature

Physical Description:

_____
_____
_____
_____
_____

History/uses:

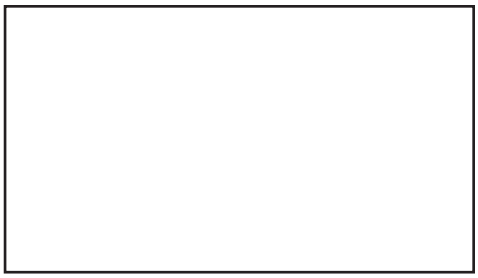
_____
_____
_____
_____

Mano #3: Type _____ Age _____

Size: _____ / _____
length width

Stone type: _____ / _____
English Native name

Photo (roll - #)_____- _____



curvature

Physical Description:

_____
_____
_____
_____
_____

History/uses:

_____
_____
_____
_____
_____

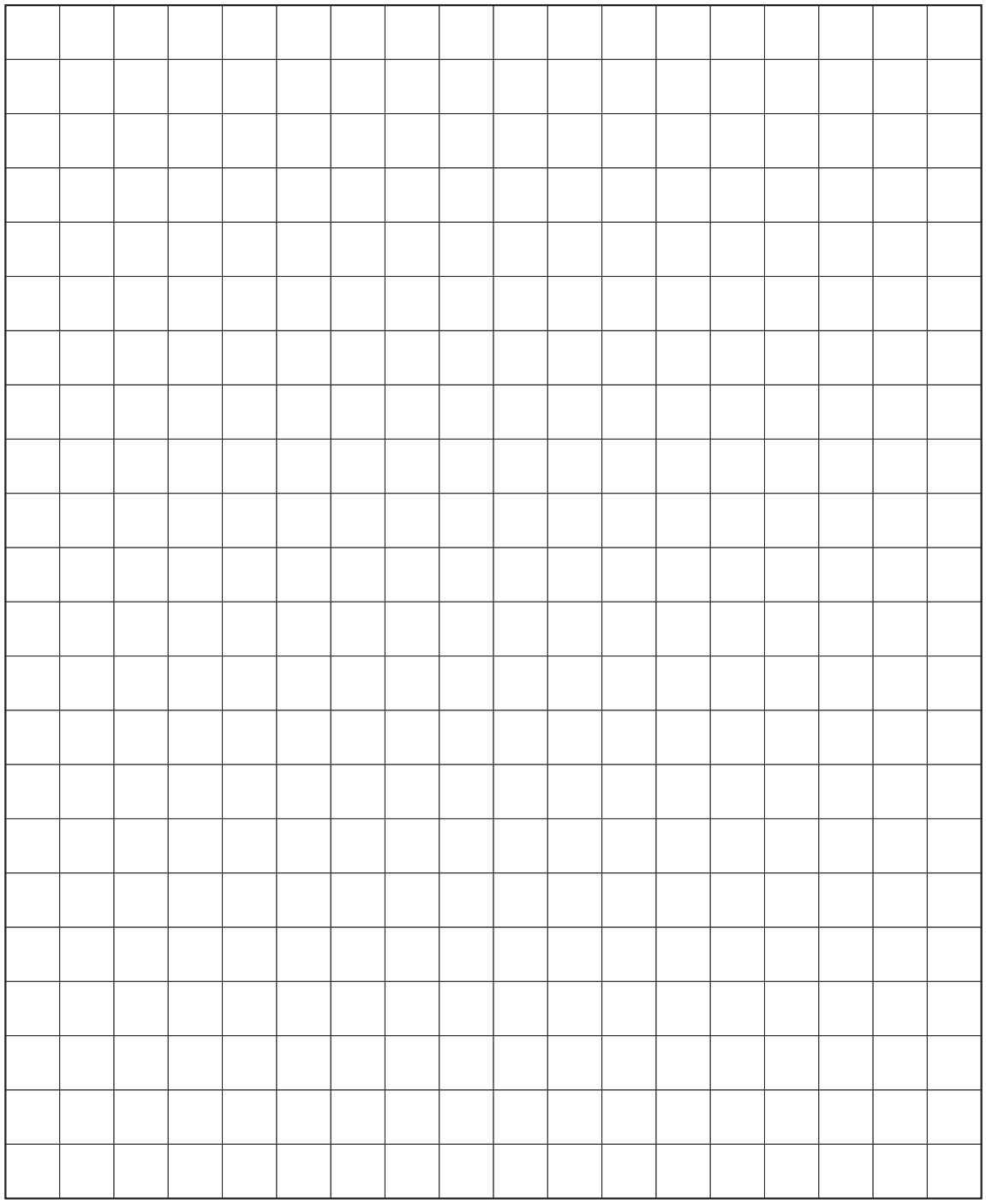
FORM B - Mano and Metate Record Sheet Continued

FORM C – Metate Usage Area Map

Mayan Metate Ethnoarchaeology

Community - House # - Map #

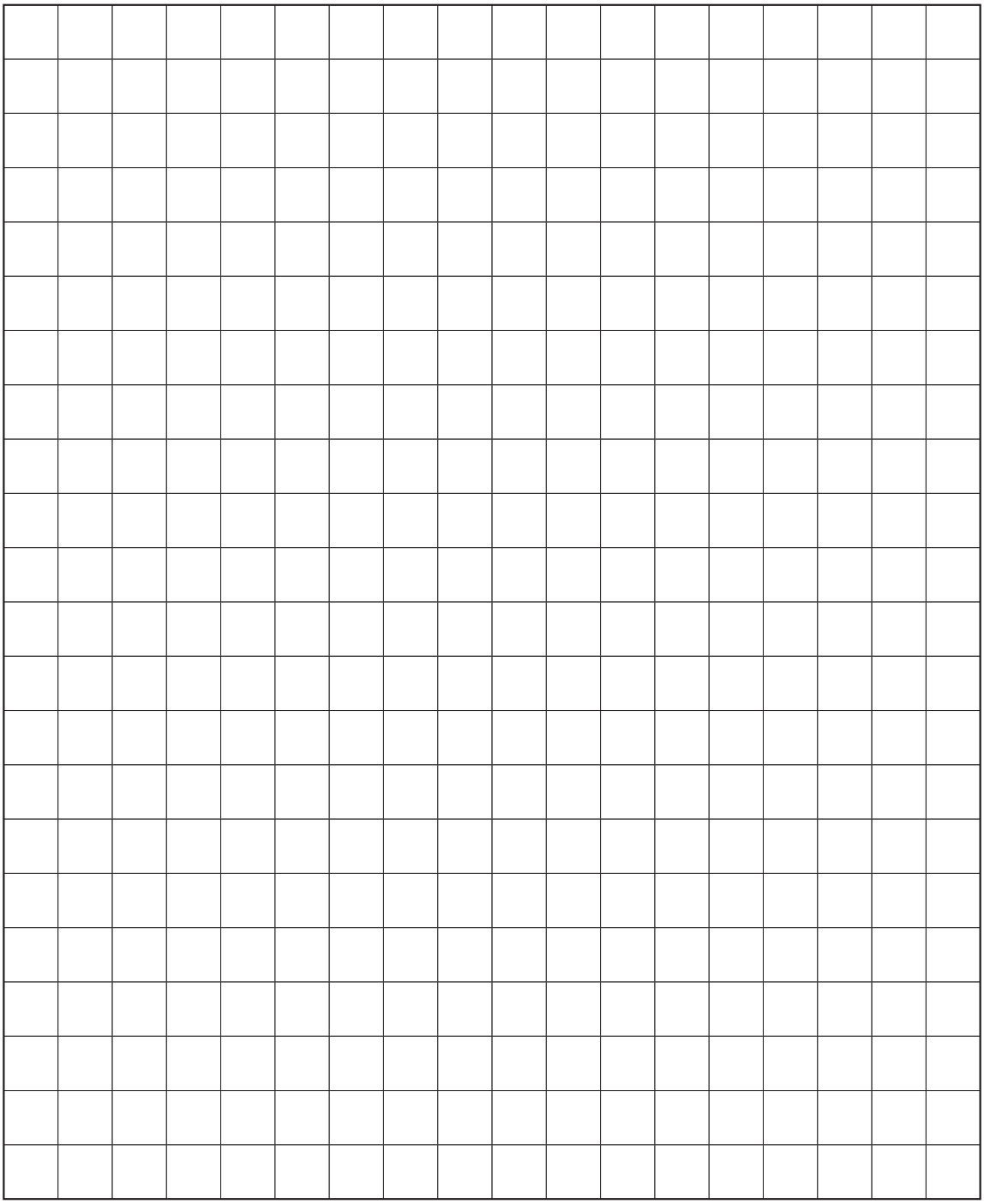
Area of Map Description



square = 1 cm^2

Community - House # - Map #

Area of Map Description



square = 1 cm^2

APPENDIX B

Summary of Survey Data

Table 1. Results from questionnaire Form A: Summary Data.

House Number	# of metates (currently)	# of manos (currently)	# of metates (lifetime)	# of manos (lifetime)	How often used	When used	# of people who use	Can men use	Broken metates or manos	How often used (molino)	Own a handgrinder
CHI-01	1	1	2	2	daily	2 meals	2	Yes	No	3 x week	No
CHI-02	3	3	3	3	3 x day	3 meals	3	No	No	daily	No
CHI-03	1	1	1	1	3 x day	3 meals	1	No	No	1 x day	No
CHI-04	2	2	2	2	3 x day	3 meals	2	No	No	1 x day	Yes
CHI-05	2	2	2	2	3 x day	3 meals	3	No	No	2 x week	Yes
CHI-06	2	2	2	2	3 x day	3 meals	1	Yes	Yes	1 x day	Yes
CHI-07	1	1	1	1	3 x day	3 meals	2	Yes	No	1 x week	Yes
CHI-08	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	Yes
CHI-09	3	3	3	3	3 x day	3 meals	1	Yes	No	1 x day	Yes
CHI-10	3	3	3	3	3 x day	3 meals	1	No	No	1 x day	Yes
CHI-11	1	1	2	2	3 x day	3 meals	3	No	Yes	1 x week	Yes
CHI-12	3	3	3	3	3 x day	3 meals	3	No	No	2 x week	Yes
CHI-13	1	1	1	1	3 x day	3 meals	3	No	No	3 x day	No
CHI-14	1	1	1	1	3 x day	3 meals	1	No	No	1 x month	Yes
CHI-15	1	1	1	1	3 x day	3 meals	1	No	No	3 x week	Yes
CHI-16	2	2	7	7	3 x day	3 meals	3	No	No	3 x day	Yes
CHI-17	3	3	3	3	3 x day	3 meals	2	No	Yes	3 x day	No
CHI-18	2	2	2	2	3 x day	3 meals	4	No	No	3 x week	Yes
CHI-19	4	4	4	4	3 x day	3 meals	2	No	Yes	2 x day	Yes
CHI-20	1	1	1	1	—	—	—	No	No	—	No
CHI-21	2	2	2	2	3 x day	3 meals	1	No	No	1 x day	Yes
CHI-22	1	1	1	1	daily	1 meal	1	No	No	1 x day	Yes
CHI-23	1	1	1	1	3 x day	3 meals	2	No	No	daily	Yes
CHI-24	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	No
CHI-25	1	1	1	1	3 x day	3 meals	2	Yes	No	monthly	Yes
CHI-26	2	2	2	2	3 x day	3 meals	2	No	No	1 x week	Yes
CHI-27	1	1	1	1	3 x day	3 meals	2	No	No	1 x day	Yes
CHI-28	1	1	1	1	3 x day	3 meals	3	No	No	3 x week	Yes
CHI-29	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	No
CHI-30	1	1	1	1	3 x day	3 meals	1	No	No	1 x day	Yes
CHI-31	1	1	1	1	3 x day	3 meals	2	No	No	3 x week	No
CHI-32	1	1	1	1	3 x day	3 meals	3	No	No	1 x day	Yes
CHI-33	2	2	2	2	3 x day	3 meals	4	No	No	1 x day	Yes

Table 1.Continued.

House Number	How often used (hand-grinder)	Always regrind after molino	Resurface frequency	Ever been without	Rather have old or new *	Leave house/take metate	# of people in house	Language	Use Area Map
CHI-01	—	Yes	1 x year	No	old	Yes	6	K'ekchi'	Yes
CHI-02	—	Yes	3 x year	No	—	No	9	K'ekchi'	Yes
CHI-03	—	Yes	occasionally	No	old	Yes	2	K'ekchi'	Yes
CHI-04	1 x day	Yes	never	No	NP	Yes	7	K'ekchi'	Yes
CHI-05	5 x week	Yes	1 x year	No	old	No	9	K'ekchi'	No
CHI-06	rarely	Yes	occasionally	No	old	No	9	K'ekchi'	Yes
CHI-07	daily	Yes	occasionally	No	old	Yes	8	K'ekchi'	Yes
CHI-08	3 x day	Yes	1 x year	No	old	Yes	5	K'ekchi'	Yes
CHI-09	1 x day	Yes	1 x year	No	old	Yes	5	K'ekchi'	No
CHI-10	1 x day	Yes	occasionally	No	old	No	6	K'ekchi'	No
CHI-11	3 x day	Yes	2 x year	No	old	Yes	10	K'ekchi'	Yes
CHI-12	3 x day	Yes	2 x year	No	old	No	7	K'ekchi'	No
CHI-13	—	Yes	1 x year	No	old	No	3	K'ekchi'	Yes
CHI-14	daily	Yes	1 x year	No	old	No	3	K'ekchi'	Yes
CHI-15	broken	Yes	never	No	old	No	8	K'ekchi'	Yes
CHI-16	never	Yes	2 x year	No	NP	No	13	K'ekchi'	Yes
CHI-17	—	Yes	2 x year	No	old	No	10	K'ekchi'	No
CHI-18	4 x week	Yes	1 x year	No	old	No	10	K'ekchi'	No
CHI-19	broken	Yes	occasionally	No	NP	No	8	K'ekchi'	Yes
CHI-20	—	No	—	No	—	No	—	K'ekchi'	No
CHI-21	rarely	Yes	1 x year	No	old	No	4	K'ekchi'	Yes
CHI-22	never	Yes	never	No	old	No	5	Spanish	Yes
CHI-23	daily	Yes	occasionally	No	new	No	8	K'ekchi'	No
CHI-24	—	Yes	occasionally	No	old	Yes	4	K'ekchi'	Yes
CHI-25	broken	Yes	3 x year	No	old	Yes	4	K'ekchi'	Yes
CHI-26	3 x day	Yes	2 x year	No	old	No	2	K'ekchi'	Yes
CHI-27	rarely	Yes	—	No	old	No	6	K'ekchi'	No
CHI-28	3 x day	Yes	1 x year	Yes	old	Yes	6	K'ekchi'	Yes
CHI-29	—	Yes	occasionally	No	old	Yes	4	K'ekchi'	Yes
CHI-30	rarely	Yes	occasionally	No	old	Yes	3	K'ekchi'	Yes
CHI-31	—	Yes	never	No	—	No	9	K'ekchi'	No
CHI-32	broken	Yes	2 x year	No	old	Yes	9	Spanish	No
CHI-33	rarely	Yes	never	No	old	No	10	K'ekchi'	No

*NP = no preference

Table 1.Continued.

House Number	# of metates (currently)	# of manos (currently)	# of metates (lifetime)	# of manos (lifetime)	How often used	When used	# of people who use	Can men use	Broken metates or manos	How often used (molino)	Own a handgrinder
CHI-34	3	3	3	3	3 x day	3 meals	6	No	No	2 x day	No
CHI-35	2	2	2	2	3 x day	3 meals	1	No	Yes	1 x day	No
CHI-36	2	2	2	2	3 x day	3 meals	2	Yes	No	3 x day	No
IXT-01	2	2	6	2	daily	2 meals	2	No	No	1 x day	No
IXT-02	3	3	3	3	weekly	when needed	2	No	No	2 x day	No
IXT-03	4	4	4	4	weekly	when needed	5	No	No	1 x day	No
IXT-04	1	1	1	1	rarely	when needed	1	No	No	1 x day	No
IXT-05	2	2	2	2	3 x day	3 meals	1	No	No	1 x day	No
IXT-06	3	3	3	3	daily	when needed	2	No	No	1 x day	No
IXT-07	2	2	2	2	rarely	when needed	2	No	Yes	daily	No
IXT-08	2	2	2	2	rarely	when needed	1	No	No	1 x day	No
IXT-09	3	3	3	3	rarely	when needed	1	No	No	1 x day	No
IXT-10	4	4	4	4	rarely	when needed	2	No	No	1 x day	No
IXT-11	2	2	2	2	rarely	when needed	1	No	No	1 x day	No
IXT-12	1	1	1	1	rarely	when needed	2	No	No	1 x day	No
IXT-13	2	2	2	2	daily	when needed	1	No	No	1 x day	No
IXT-14	3	3	3	3	rarely	when needed	2	No	No	1 x day	No
IXT-15	3	3	3	3	weekly	when needed	2	No	Yes	1 x day	No
IXT-16	4	4	4	4	rarely	when needed	3	No	No	1 x day	No
IXT-17	1	1	1	1	rarely	—	2	No	No	1 x day	No
IXT-18	2	2	2	2	daily	when needed	1	No	No	1 x day	No
IXT-19	5	5	5	5	weekly	when needed	3	No	No	1 x day	No
IXT-20	3	3	3	3	weekly	when needed	4	No	Yes	1 x day	No
IXT-21	4	4	4	4	weekly	when needed	1	No	No	1 x day	No
IXT-22	2	2	2	2	rarely	when needed	2	No	No	1 x day	No
IXT-23	3	3	3	3	daily	when needed	2	No	Yes	1 x day	No
IXT-24	1	1	1	1	weekly	when needed	2	No	No	1 x day	No
PAN-01	1	1	2	2	3 x day	3 meals	5	No	Yes	2 x week	Yes
PAN-02	1	1	1	1	3 x day	3 meals	2	Yes	No	daily	No
PAN-03	1	1	1	1	3 x day	3 meals	1	No	No	monthly	Yes
PAN-04	1	1	1	1	3 x day	3 meals	1	No	No	1 x year	No
PAN-05	1	1	1	1	3 x day	3 meals	1	Yes	No	2 x year	Yes
PAN-06	2	1	5	5	3 x day	3 meals	2	No	Yes	5 x year	Yes

Table 1.Continued.

House Number	How often used (hand-grinder)	Always regrind after molino	Resurface frequency	Ever been without	Rather have old or new *	Leave house/take metate	# of people in house	Language	Use Area Map
CHI-34	—	Yes	never	No	old	No	17	K'ekchi'	Yes
CHI-35	—	Yes	1 x year	No	old	No	5	K'ekchi'	Yes
CHI-36	—	Yes	2 x year	No	old	No	7	K'ekchi'	Yes
IXT-01	—	Yes	1 x year	No	old	No	4	Spanish	Yes
IXT-02	—	No	3 x year	No	old	No	9	K'iche'	Yes
IXT-03	—	No	never	No	old	No	12	K'iche'	Yes
IXT-04	—	No	2 x year	No	NP	No	5	K'iche'	No
IXT-05	—	Yes	4 x year	No	old	No	10	K'iche'	Yes
IXT-06	—	No	occasionally	No	old	No	6	K'iche'	Yes
IXT-07	—	No	occasionally	No	—	No	—	K'iche'	No
IXT-08	—	No	never	No	old	No	5	K'iche'	Yes
IXT-09	—	No	3 x year	No	old	No	10	K'iche'	Yes
IXT-10	—	No	never	No	old	No	2	K'iche'	Yes
IXT-11	—	No	occasionally	No	—	No	6	K'iche'	Yes
IXT-12	—	No	occasionally	No	old	No	6	K'iche'	No
IXT-13	—	No	occasionally	No	old	No	4	K'iche'	Yes
IXT-14	—	No	never	No	old	No	6	K'iche'	No
IXT-15	—	No	never	No	NP	No	6	Spanish	Yes
IXT-16	—	No	never	No	old	No	8	Spanish	Yes
IXT-17	—	No	—	No	—	No	9	K'iche'	No
IXT-18	—	Yes	never	No	old	No	5	K'iche'	Yes
IXT-19	—	No	never	No	old	No	9	K'iche'	Yes
IXT-20	—	No	never	No	old	No	6	K'iche'	Yes
IXT-21	—	No	never	No	old	No	9	K'iche'	Yes
IXT-22	—	No	occasionally	No	NP	No	8	K'iche'	No
IXT-23	—	Yes	—	No	—	No	6	K'iche'	Yes
IXT-24	—	No	1 x year	No	old	No	4	K'iche'	Yes
PAN-01	5 x week	Yes	1 x year	No	old	Yes	10	K'ekchi'	Yes
PAN-02	—	Yes	2 x year	No	new	No	7	K'ekchi'	Yes
PAN-03	3 x day	Yes	4 x year	No	—	Yes	4	K'ekchi'	Yes
PAN-04	—	Yes	1 x year	No	—	Yes	3	K'ekchi'	No
PAN-05	3 x day	Yes	never	No	—	Yes	4	K'ekchi'	Yes
PAN-06	3 x day	Yes	occasionally	No	—	Yes	—	K'ekchi'	Yes

*NP = no preference

Table 1.Continued.

House Number	# of metates (currently)	# of manos (currently)	# of metates (lifetime)	# of manos (lifetime)	How often used	When used	# of people who use	Can men use	Broken metates or manos	How often used (molino)	Own a handgrinder
PAN-07	1	1	1	1	3 x day	3 meals	1	No	No	1 x year	Yes
PAN-08	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	No
PAN-09	1	1	2	2	3 x day	3 meals	1	No	No	3 x week	Yes
PAN-10	2	2	2	2	3 x day	3 meals	1	No	No	1 x week	Yes
PAN-11	1	1	1	1	3 x day	3 meals	1	No	No	2 x year	Yes
PAN-12	1	1	1	1	3 x day	3 meals	2	No	No	2 x week	Yes
PAN-13	2	2	2	2	3 x day	3 meals	2	No	No	1 x month	Yes
PAN-14	2	2	2	2	3 x day	3 meals	4	Yes	No	3 x week	Yes
PAN-15	1	1	2	2	3 x day	3 meals	1	No	No	3 x week	Yes
PAN-16	1	1	1	1	3 x day	3 meals	1	Yes	No	never	Yes
PAN-17	1	1	1	1	3 x day	3 meals	1	No	No	5 x week	No
PAN-18	1	1	3	3	3 x day	3 meals	1	No	No	3 x week	No
PAN-19	1	1	1	1	3 x day	3 meals	2	No	No	2 x week	No
PAN-20	2	2	3	3	3 x day	3 meals	3	No	No	never	Yes
PAN-21	2	2	3	3	3 x day	3 meals	2	Yes	No	1 x month	No
PAN-22	1	1	1	1	3 x day	3 meals	2	No	No	never	Yes
PAN-23a	1	1	1	1	3 x day	3 meals	1	No	No	never	Yes
PAN-23b	1	1	1	1	3 x day	3 meals	3	No	No	3 x day	Yes
PAN-24	1	1	1	1	3 x day	3 meals	1	No	No	never	Yes
PAN-25	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	No
PAN-26	2	2	2	2	3 x day	3 meals	3	No	No	never	Yes
PAN-27	1	2	1	2	3 x day	3 meals	2	No	Yes	never	Yes
PAN-28	1	1	1	1	3 x day	3 meals	2	No	No	3 x day	No
PAN-29	1	1	1	1	3 x day	3 meals	1	No	No	1 x week	No
PAN-30	1	1	1	1	3 x day	3 meals	1	No	No	2 x day	Yes
PAN-31	1	1	1	1	3 x day	3 meals	1	No	No	3 x week	No
PAN-32	1	1	1	1	3 x day	3 meals	1	No	No	4 x week	No
PAN-33	1	1	4	4	3 x day	3 meals	1	No	No	1 x day	No
PAN-34	1	1	3	3	3 x day	3 meals	1	No	No	2 x year	Yes
PAN-35	3	3	3	3	3 x day	3 meals	2	Yes	No	1 x week	Yes
PAN-36	1	1	1	1	3 x day	3 meals	1	No	No	1 x day	No

Table 1.Continued.

House Number	How often used (hand-grinder)	Always regrind after molino	Resurface frequency	Ever been without	Rather have old or new *	Leave house/take metate	# of people in house	Language	Use Area Map
PAN-07	3 x day	Yes	occasionally	No	new	Yes	4	K'ekchi'	Yes
PAN-08	—	Yes	2 x year	Yes	old	Yes	6	K'ekchi'	Yes
PAN-09	3 x day	Yes	1 x year	No	old	No	10	K'ekchi'	Yes
PAN-10	3 x day	Yes	1 x year	No	old	Yes	5	K'ekchi'	Yes
PAN-11	3 x day	Yes	1 x year	No	NP	No	7	K'ekchi'	Yes
PAN-12	3 x day	Yes	1 x year	No	old	Yes	8	K'ekchi'	Yes
PAN-13	3 x day	Yes	2 x year	No	old	Yes	13	K'ekchi'	Yes
PAN-14	broken	Yes	3 x year	No	old	Yes	8	K'ekchi'	Yes
PAN-15	3 x day	Yes	2 x year	No	old	No	7	K'ekchi'	Yes
PAN-16	broken	Yes	3 x year	No	old	No	2	K'ekchi'	Yes
PAN-17	—	Yes	3 x year	No	old	Yes	4	K'ekchi'	Yes
PAN-18	—	Yes	3 x year	No	NP	Yes	3	K'ekchi'	Yes
PAN-19	—	Yes	3 x year	Yes	old	Yes	7	K'ekchi'	Yes
PAN-20	3 x day	Yes	1 x year	No	old	Yes	7	K'ekchi'	Yes
PAN-21	—	Yes	1 x year	No	NP	Yes	3	K'ekchi'	Yes
PAN-22	3 x day	Yes	1 x year	No	old	Yes	5	K'ekchi'	Yes
PAN-23a	3 x day	Yes	2 x year	No	old	No	6	K'ekchi'	Yes
PAN-23b	3 x day	Yes	3 x year	Yes	old	No	9	K'ekchi'	Yes
PAN-24	3 x day	Yes	1 x year	No	old	No	6	K'ekchi'	Yes
PAN-25		Yes	4 x year	Yes	old	No	5	K'ekchi'	Yes
PAN-26	3 x day	Yes	3 x year	No	old	No	12	K'ekchi'	Yes
PAN-27	3 x day	Yes	3 x year	Yes	NP	Yes	6	K'ekchi'	Yes
PAN-28	—	Yes	3 x year	No	new	No	8	K'ekchi'	Yes
PAN-29	—	Yes	2 x year	No	old	No	4	K'ekchi'	Yes
PAN-30	broken	Yes	1 x year	No	NP	No	5	K'ekchi'	Yes
PAN-31	—	Yes	2 x year	No	NP	No	5	K'ekchi'	Yes
PAN-32	—	Yes	1 x year	No	new	Yes	6	Spanish	Yes
PAN-33	—	Yes	occasionally	No	old	No	3	K'ekchi'	Yes
PAN-34	3 x day	Yes	3 x year	Yes	new	Yes	7	K'ekchi'	Yes
PAN-35	3 x day	Yes	1 x year	No	old	Yes	7	K'ekchi'	Yes
PAN-36	—	Yes	1 x year	No	NP	No	5	K'ekchi'	Yes

*NP = no preference

Table 2. Interviewees, relationship to other household members, and those who use manos and metates in each house.

House Number	Person Interviewed	# of people in house	Relationship to interviewee	# of people who grind	Who grinds
CHI-01	Amalia Che	6	her and husband (2), son and daughter-in-law (2), 1 grandchild	2	her and daughter
CHI-02	Juana Ca'al	9	parents (2), her and husband (2), 1 child, 4 brothers and sisters	3	her, sister, and 1 sister-in-law
CHI-03	Candelaria Tu'ul	2	her and husband	1	her (wife)
CHI-04	Feliza Ico Ca'al	7	her and husband (2), 5 children	2	her and daughter
CHI-05	Manuel Ca'al	9	parents (2), him (1), 2 sisters, 2 nephews/ nieces, grandfather and grandmother (2)	3	his mother, 2 sisters
CHI-06	Filomena Baraona Cu'cul	9	her, 1 son-in-law, 6 children, 1 grandchild	1	her
CHI-07	Emilio Che	8	him and wife (2), 4 children, 1 sister-in-law, 1 niece	2	her (wife/mother) and her sister
CHI-08	Sebastiana Che	5	her and husband (2), 3 children	1	her (wife/mother)
CHI-09	Concepcion Pop	5	her and husband (2), 3 children	1	her (wife/mother)
CHI-10	Victoria Pop Xol	6	her, father, 4 brothers	1	her (daughter)
CHI-11	Josefina Coc	10	her and husband, 8 children	3	her (mother/wife), 2 daughters
CHI-12	Angelina Ba Cucul	7	her, mother and father, 4 children	3	her, mother, little sister
CHI-13	Candelaria Yax Ca'al	3	her, daughter and grandson	3	her and 2 daughters
CHI-14	Amalia Chen	3	her and husband, 1 child	1	her
CHI-15	Theodora Chup Tzib	8	her and husband, 6 children	1	her
CHI-16	Ricardo Ba	13	him and wife (2), 1 son, 1 daughter-in-law, 2 daughters, 8 grandchildren.	3	2 daughters, 1 daughter-in-law
CHI-17	Rosa Ba	10	her and husband (2), 8 children	2	her and daughter
CHI-18	Adelia Pop	10	her and husband (2), 8 children	4	her and 3 daughters
CHI-19	Pedro Ca'al	8	mother and father (2), 5 brothers and sisters, him	2	mother and sister

Table 2. Continued.

House Number	Person Interviewed	# of people in house	Relationship to interviewee	# of people who grind	Who grinds
CHI-20	Ofelia Ba	—		1	her
CHI-21	Manuela Pop Ca'al	4	her and husband (2), 2 children	1	her
CHI-22	Zoila Baraona	5	her and husband (2), 3 children	1	paid worker - "mos" (servant)
CHI-23	Dominga Chub Pop	8	her and husband (2), 6 children	2	her and daughter
CHI-24	Aurelia Tiul Chup	4	her and husband (2), 2 children	1	her
CHI-25	Theodora Tiul	4	her (she is the grandmother), her son and his wife (2), 1 granddaughter	2	her and daughter
CHI-26	Carmen Chub	2	her, her daughter (both their husbands have died)	2	her and daughter
CHI-27	Manuel Tiul (her father)	6	her parents (2), her, 3 brothers and sisters	2	her and mother
CHI-28	Natividad Xol Mucu	6	her and husband (2), 4 children	3	her and 2 daughters
CHI-29	Encarnacion Mucu Xol	4	her and husband (2), 2 children	1	her
CHI-30	Dominga Mucu Xol	3	her and husband (2), 1 daughter	1	her
CHI-31	Maria Vicente Ical	9	her and husband (2), 7 children	2	her and daughter
CHI-32	Thelma de Leon de Baraona	9	her and husband (2), 7 children	3	her and 2 daughters
CHI-33	Aurelia Ical	10	her and husband (2), 8 children	4	her and 3 daughters
CHI-34	Elvira Ca'al Che	17	him and wives (3), his grandmother, 13 children	7	her and 6 daughters
CHI-35	Domingo Yax Ca'al	5	him and wife (2), 3 children	1	his wife
CHI-36	Dolores Yax Ca'al	7	her, her daughter and son-in-law (2), 4 children	2	her and daughter
IXT-01	Santos Tziquin Tambriz	4	mother and father (2), him and sister (2)	2	mother and sister
IXT-02	Manuela Paulina Ixtos Tambriz	9	her and husband (2), 7 children	2	her and daughter

Table 2. Continued.

House Number	Person Interviewed	# of people in house	Relationship to interviewee	# of people who grind	Who grinds
IXT-03	Manuela Tzikin Tambriz (Pascuala Faustina Tzep Tzikin, daughter)	12	her and husband (2), 3 sons and 1 daughter, 3 daughter-in-laws, 3 grandchildren	5	her, daughter, 3 daughter-in-laws
IXT-04	Catarina Warchaj	5	her and husband (2), 3 children	1	her
IXT-05	Dominga Chibalan Sac	10		1	her
IXT-06	would not give name	6	her and husband (2), 2 daughters and 3 sons	2	her and niece
IXT-07	would not give name	—	—	2	wife and daughter
IXT-08	Maria Warchaj	5	her and husband (2), 3 children	1	her
IXT-09	would not give name	10	her and husband (2), 8 children	1	her
IXT-10	Anna Ixquiactap	2	her and her sister	2	her and sister
IXT-11	Mikaela Xocol Cumes	6	her and husband (2), 2 sons, 2 daughter-in-laws	1	her (mother/ wife)
IXT-12	Catarina Garcia	6	her and husband (2), son, daughter-in-law, 2 grandchildren	2	her and daughter-in-law
IXT-13	Louisa Ixquiactap	4	Her and husband (2), 2 children	1	her
IXT-14	Isabel Tzep Warchaj	6	her and husband (2), 2 children, 1 daughter-in-law, 1 grandchild	2	her and daughter
IXT-15	Ana Tzep Tzikin	6	her and husband (2), 4 children	2	her and daughter
IXT-16	Lorenzo Warchaj	8	father and mother (2), 5 brothers, his wife (1).	3	his wife, mother, and grandmother
IXT-17	Petrona Warchaj Tepaz	9	her and husband (2), 7 children	2	her and daughter
IXT-18	Manuela Och Ixquiactap	6	her and husband (2), 4 children	1	her
IXT-19	Catarina Braulia Xocom Suy	9	her and husband (2), grandparents (2), her parents (2), and 3 children	3	her, grandmother, and mother
IXT-20	Maria Elena Warchiaj	7	her, parents (2), 2 brothers, 1 sister-in-law, 1 niece	4	her, sister, mother, daughter-in-law

Table 2. Continued.

House Number	Person Interviewed	# of people in house	Relationship to interviewee	# of people who grind	Who grinds
IXT-21	Mikaela Garcia Tambriz	9	her and huband (2), 7 children	1	her
IXT-22	Petrona Tzikin Tambriz	8	her and husband (2), 6 children	2	her and daughter
IXT-23	Elena Salquil	6	her and husband (2), 4 children	2	her and daughter
IXT-24	Maria Salquil Chox	4	father, 2 sisters, 1 brother-in-law	2	her and sister
PAN-01	Josefina Chup	10	2 sons, 2 daughter-in-laws, 2 daughters, parents (2), 2 grandchildren	5	her (mother), 2 daughters, 2 daughter-in-laws
PAN-02	Ofelia Ca'al Pop	7	her and husband (2), 3 children, 1 little brother, 1 sister-in-law.	2	her and little sister
PAN-03	Carmen Estel Cho Chup	4	Husband (1), 2 kids, her (1)	1	her (mother)
PAN-04	Romelia Ca'al Pop	3	Husband (1), her (1), 1 child	1	her (mother/wife)
PAN-05	Carlota Ca'al	4	Her and husband (2), 2 children	1	her (mother/wife)
PAN-06	Rosa Pop de Ca'al	—	—	2	her (mother/wife), grand-daughter
PAN-07	Marta Ca'al Pop	4	Her and husband (2), 2 children	1	her (wife/mother)
PAN-08	Alberto Ca'al Cuj	6	Him and wife (2), 4 children	1	her (mother/ wife)
PAN-09	Maria Botzoc	10	Her and husband (2), 8 children	1	her (mother/wife)
PAN-10	Margarit Beb Cuj	5	Her and husband (2), father, 2 children.	1	her
PAN-11	Elena Hu	7	Her and husband (2), 5 children	1	her (mother/wife)
PAN-12	Maria Tzib	8	her and husband (2), 6 children	2	her (mother/wife), daughter
PAN-13	Jose Can Ch'ol	13	Him and wife (2), 9 children, 1 son-in-law, 1 grandchild	2	his wife and daughter
PAN-14	Daniel Beb Chok	8	him and wife (2), 2 boys, 4 girls, 1 daughter-in-law	4	his mother, daughter-in-law, 2 daughters
PAN-15	Roberto Tzib Beb	7	Him and wife (2), 5 children	1	his wife
PAN-16	Domingo Toj Laj	2	him and wife	1	his wife
PAN-17	Juan Cuc Tzib	4	him and wife (2), 2 children	1	his wife

Table 2. Continued.

House Number	Person Interviewed	# of people in house	Relationship to interviewee	# of people who grind	Who grinds
PAN-18	—	3	her and husband (2), 1 grandchild from time to time	1	her (mother/wife)
PAN-19	Carmen Ca'al Cuj	7	Her and husband (2), 5 children	2	her and daughter
PAN-20	Juana Beb	7	Her and husband (2), 5 kids	3	her, 2 daughters
PAN-21	Carnacion Choc Beb	3	her (1), 2 kids	2	her and daughter
PAN-22	Amalia Chok	5	Her and husband (2), husbands mother (1), 2 children	2	his wife and mother
PAN-23a	Angelina Chok	6	Her and husband (2), 4 children	1	her (mother/wife)
PAN-23b	Hector Beb Chok	9	Him and wife (2), 7 children	3	his wife, 2 daughters
PAN-24	Roberto Beb	6	Him and wife (2), 2 older people (parents?), 2 children	1	his wife
PAN-25	Candelaria Chok	5	Her and husband (2), 3 children	1	her (mother/wife)
PAN-26	Dominga Hub	12	3 sisters, 2 brother-in-laws, parents (2), 5 children	3	her 3 sisters
PAN-27	Alfredo Can	6	Him and wife (2), 4 children	2	her, daughter
PAN-28	Eida Molinda	8	her and husband (2), mother, 5 children	2	her and mother
PAN-29	Paulino Cuc	4	him and 3 children	1	daughter
PAN-30	Carolina Ca'al	5	her and husband (2), 3 children	1	her (mother/wife)
PAN-31	Irma Ca'al	5	her and husband (2), 3 children	1	her (mother/wife)
PAN-32	Josefina Tziboy	6	her (1), 1 mother, 4 children	1	her (mother/wife)
PAN-33	Candelaria Cuj Ca'al	3	her and husband (2), 1 grandchild	1	her (mother/wife)
PAN-34	Maria Ca'al	7	her and husband (2), 3 children, 2 grand children	1	her (mother), 2 daughters
PAN-35	Teresa Martin	7	her and husband (2), 4 children, 1 other girl	2	her and daughter
PAN-36	Elvira Ma'as	5	her and husband (2), 3 children	1	her (mother/wife)

Table 3. Why manos and metates are important and how people would feel without them.

House Number	Why are manos and metates important and how would you feel without them?
CHI-01	I'd do nothing. I wouldn't eat.
CHI-02	Did not have an answer.
CHI-03	I would just make tortillas with the masa that was ground at the molino.
CHI-04	I wouldn't be able to make tortillas, and without tortillas, I wouldn't eat.
CHI-05	It wouldn't be good. There would be nothing to give us our tortillas.
CHI-06	I would feel bad if I didn't have a metate. We grind everything on it to eat or drink.
CHI-07	We would have nothing to prepare our food on and we would die.
CHI-08	Without a metate, we wouldn't eat.
CHI-09	We need it to eat.
CHI-10	No metate, no tortillas.
CHI-11	I wouldn't be able to grind all the things I usually grind as well as I would like, but I would just use my handgrinder.
CHI-12	It would be bad because I can only grind my food with the metate.
CHI-13	My heart would ache. What would I do without it? Where would I get my tortillas?
CHI-14	How would I grind?
CHI-15	Did not have an answer.
CHI-16	Without the metate, we wouldn't eat.
CHI-17	It would mean trouble. It is the metate that gives us our food.
CHI-18	How would I grind without my metate?
CHI-19	If there is nothing to work on, then I can't grind.
CHI-20	Did not have an answer.
CHI-21	I have to do the fine grind to be able to make tortillas. Otherwise, the tortillas will be too *k'es* (sharp/chunky).
CHI-22	The metate makes the tortillas better. It helps grind the corn to a very fine consistency where they can be patted out very thin. It also helps keep them from being chunky.
CHI-23	It would be bad because I couldn't grind, and I have to grind to have tortillas.
CHI-24	It would be bad and I would not be able to grind.
CHI-25	We wouldn't be able to do anything without our metate.
CHI-26	The metate is the reason we are alive.
CHI-27	Did not have an answer.
CHI-28	Without one, I would not have anything to grind my tortillas on.
CHI-29	It would be bad because I wouldn't be able to grind my tortillas.
CHI-30	I wouldn't be able to make tortillas.
CHI-31	No metate, no tortillas.
CHI-32	I grind because the dough out of the molino is too coarse. It has to be ground finer. I have gotten accustomed to using my metate. It would be hard to be without it.
CHI-33	It would be hard. Without it, what would I use?
CHI-34	We wouldn't be able to eat without them.

Table 3. Continued

House Number	Why are manos and metates important and how would you feel without them?
CHI-35	How would we eat?
CHI-36	If I have a metate, I can eat.
IXT-01	I regrind the dough because I can't make tortillas without the masa being very fine. Coming from the molino, it is too coarse. I would still be able to make tortillas, but they wouldn't have the same taste as when they are ground on the metate.
IXT-02	I would need to have one.
IXT-03	It wouldn't bother me because there is a molino where I can grind my corn.
IXT-04	If there is no molino, no corn can be ground.
IXT-05	Did not have an answer.
IXT-06	It is important to have a metate. If we didn't have one, we would borrow one so we could grind out our tortillas.
IXT-07	We have to have a metate because without we could not have our "daily bread."
IXT-08	If the community molino breaks, we have a metate to grind on.
IXT-09	We have to have them because if the molino is not working, we have to do it by hand and it is what we need to have food.
IXT-10	Before, there was no molino so we had to use a metate. Sometimes the molino doesn't grind the corn well, so we have to regrind it.
IXT-11	Sometimes we need them for other purposes and this is why they are important. (beans, *recado*, etc.)
IXT-12	It helps to grind many things, not just corn.
IXT-13	It's important because at Christmas time we use them to make tamales.
IXT-14	We use it because that is what our first fathers and mothers had. Also, there are times when there is no molino.
IXT-15	We need them. Sometimes we make things like horchata with rice and other things.
IXT-16	It is our custom. If the masa is not finely ground, you can't make tortillas.
IXT-17	Did not have an answer.
IXT-18	It is important because it is our instrument to use everyday. We use it in various activities. We use it for atole de maize and for chickens (food).
IXT-19	It is our mission, our instrument. Before molinos, I would get up at 3 am and grind until 8 or 9 am. If we didn't have enough tortillas for the day, I would do it again later.
IXT-20	If there is no molino (or no electricity to run the molino) we have to grind the nixtamal with the metate.
IXT-21	When there is no electricity, we have to grind all the corn on our metates.
IXT-22	We need it to regrind the masa and to grind beans.
IXT-23	When the molino does not grind the masa well, the metate has to be used to grind it finer.
IXT-24	It is our instrument used for our food. It makes the masa fine.
PAN-01	If there is no metate, there would be no tortillas for the kids. Nobody would be happy if there was no metate because they could not make tortillas.

Table 3. Continued

House Number	Why are manos and metates important and how would you feel without them?
PAN-02	Tortillas will break/crumble (*na'che'*) if the dough is not reground on the metate. We would not eat. It would not be good.
PAN-03	To make the masa smooth. Otherwise, it is too "*k'es*" (chunky). It is good so they can eat.
PAN-04	If we didn't have a metate, we couldn't eat. It is very impotant.
PAN-05	Without a metate, we would not eat.
PAN-06	We use it to make tortillas for workers. If no metate, we wouldn't eat. It is the woman's work to get up early every morning before the sunrises. We start the fire, clean the nixtamal, and grind the corn. It provides us with food.
PAN-07	Our hearts would be sad because we would not eat without a metate. It gives us tortillas that sustain us each day.
PAN-08	At one time, I didn't have any work so I couldn't buy one so we would just buy our tortillas. Without the metate, there would be no tortillas. It is our life to eat. We have to eat corn, it is our survival.
PAN-09	I would feel terrible and would die of hunger. It's important because it provides us with food.
PAN-10	Without it there would be no food. It gives tortillas to us for everything we do.
PAN-11	By it, we eat and without it we wouldn't eat. It is good to use it to grind. I would be sad without one. What would I use to grind with? We would have no tortillas.
PAN-12	Without one, we wouldn't eat.
PAN-13	It is good. If we don't have the metate, we won't be able to work because there would be no tortillas.
PAN-14	Work comes first - "*Xben cua, li trabaj*." If there is no tortillas, no work is done. It is our work. If it is not ground on the metate, them the only thing we can make is the *poch* (tamale). We can't make tortillas.
PAN-15	We wouldn't eat. If there is no metate, women would not have work and there would be no food.
PAN-16	Without the metate, we wouldn't eat.
PAN-17	There would be no tortillas. That's all we eat.
PAN-18	It is great because it can be used to grind everything we eat.
PAN-19	We have to use it for everything. We were without for 2 weeks after it was stolen (one that my grandmother gave to me 10 yrs ago). It was one that had been past down from ancestors. Without a metate, there would be no food.
PAN-20	Without it we wouldn't eat.
PAN-21	It is good to have a metate.
PAN-22	I would not eat. Maybe you could eat *poch* (tamales), but you'd get bored.
PAN-23a	No metate, no food.
PAN-23b	When we moved out of our house, we didn't have one.
PAN-24	No metate, no food.

Table 3. Continued

House Number	Why are manos and metates important and how would you feel without them?
PAN-25	It was stolen, but later I found it in the woods without a mano. We wouldn't be able to eat without it.
PAN-26	Did not have an answer.
PAN-27	When we moved out of my mother's house, we did not have one, so my mother bought one for her. If no metate, no food.
PAN-28	When my husband and I moved out of my mother's house, my mother gave me one when we left. Without one, how would I grind? How would I eat?
PAN-29	Without a metate, there would be no food.
PAN-30	No metate, no tortillas.
PAN-31	We have to have a metate because without it, we would not have tortillas.
PAN-32	We have to grind the corn, and when we don't go to the molino, we have to do it on our stone. If we have no metate, then there will be no food.
PAN-33	No metate, no food.
PAN-34	We had to buy tortillas from other people when we didn't have one. If there is no metate, there is no food.
PAN-35	I'd feel desparate without one. What would my children eat?
PAN-36	It is our food; it makes our food.

Table 4. Metate data summary from Form B.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-01-1	Eastern	100-150	49	36	19.5	9	14	5	40	27	basalt	—
CHI-02-1	Eastern	—	47	35	23	7	17	4	41	26	basalt	—
CHI-02-2	Eastern	—	52	37.5	22	12	16	4.5	44	29	basalt	—
CHI-02-3	Eastern	—	—	—	—	—	—	—	—	—	basalt	—
CHI-03-1	Eastern	50	49	35.25	21	10	14.5	5	39	27	basalt	—
CHI-04-1	Eastern	10	46.75	31.5	14	10	9	4.5	38	23	basalt	—
CHI-04-2	Eastern	15	44.5	31	15.5	8.75	11	4	36	24	basalt	—
CHI-05-1	Eastern	50-60	47	35.5	17.5	10	11.5	5.5	38	27	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-01-1	Large metate with very deep trough. I photographed this one in 2003 field season.	This was her grandmother's metate with an estimated date of 100-150 years old. (She also bought one for her son 18 yrs ago for Q20 and a day's labor was Q.50 per day at that time.)	45	given	grandmother	—	—
CHI-02-1	Smaller than other (metate #2). Both are used, dark basalt. Proximal end on this one sits really high.	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-02-2	One of the bigger ones I've seen. Long and wide.	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-02-3	In storage and was not being used, would not remove.	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-03-1	Rounded corners, deep basin (2 cm). Dark basalt, tall proximal end.	This metate was bought and used by her mother a long time ago. Mixed answers about where her mother got the metate. She now said that it may be 100 yrs old.	50	given	mother	25	.25 per day
CHI-04-1	Typical Eastern, dark basalt.	This one was bought 10 years ago in Carcha.	10	bought	Carcha market	60	—
CHI-04-2	—	Given to her by her father when she got married 15 years ago. She only used it for about a year, she thinks.	15	given	father	—	—
CHI-05-1	The distal legs are not at such a steep angle as newer ones (see sketch on survey notes). Corners are rounded, very deep basin (about 3.75 cm deep). Proximal leg is stubby and stout.	Grandfather bought it years ago in Carcha.	50-60	bought	Carcha market	8	.10 per day

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-05-2	Eastern	50-60	—	—	—	—	—	—	—	—	basalt	—
CHI-06-1	Eastern	?	48.5	36	8	10	4	4	41	27.5	basalt	—
CHI-07-1	Eastern	6	47	31.75	14	9.5	9	4	37	23.5	basalt	—
CHI-08-1	Eastern	?	46.5	39.5	16	7.5	10	3.5	30.5	23	basalt	—
CHI-09-1	Eastern	“old”	—	—	—	—	—	—	—	—	basalt	—
CHI-09-2	Eastern	6	50	32	17.5	10	11.5	3.5	39	24.5	basalt	—
CHI-09-3	Eastern	2	—	—	—	—	—	—	—	—	basalt	—
CHI-10-1	Eastern	?	46.5	31.25	15	6.5	10	3.5	38	23.5	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-05-2	This one is up in storage (probably above the rafters of the roof). They didn't want to get it down or go into their kitchen to get the other one.	Grandfather, who lives with them, bought it in Carcha many years ago.	50-60	bought	Carcha market	8	.10 per day
CHI-06-1	Medium deep basin (1-2 cm), rounded edges. Proximal leg broke off when she dropped it once.	This was given to her by her mother. She doesn't know how old it is.	24	given	mother	—	—
CHI-07-1	Proximal top edge is chipped a bit, but otherwise, it is still rather new.	They bought it 6 yrs ago in Carcha when they built their own house and moved out of his parent's house.	6	bought	Carcha market	95	Q15 6yrs ago
CHI-08-1	Newer, small distal legs with many vesicles showing. Basin is not very deep, indicating little use.	It was bought by her in-laws (Amalia and Pablo Che) for the purpose of giving it to one of their children when they left the home. Sebastiana and Ismael got it from his parents 11 yrs ago when they were married and moved out from his parent's house.	11	given	mother-in-law	—	—
CHI-09-1	They would not allow us to see this metate.	Given to her by her parents when she got married.	—	given	her parents	—	—
CHI-09-2	Large vesicles (1 cm in diameter), brown from grinding only coffee, shallow basin.	This one was bought for one of her children for when they move out of the house.	6	bought	Chicojll	100	—
CHI-09-3	They would not allow us to see this metate.	She bought it 2 yrs ago for when one of her children gets married and moves out of the house.	2	bought	Chicojll	125	—
CHI-10-1	(They would only let us see this one, which was in storage and is apparently the oldest.) Dark basalt, in storage up against wall in bedroom.	Given to her by her father long ago. Doesn't know how old it is.	?	given	father	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-10-2	Eastern	?	—	—	—	—	—	—	—	—	basalt	—
CHI-10-3	Eastern	?	—	—	—	—	—	—	—	—	basalt	—
CHI-11-1	Eastern	3	45.2	31.5	17.2	13	12	5.5	38	23.5	basalt	—
CHI-12-1	Eastern	2 generations	39.5	29.5	16.5	7	10	3.5	29	25	basalt	—
CHI-12-2	Eastern	1 generation	49.5	33	16.5	7	12.5	3.5	38	25	basalt	—
CHI-12-3	Eastern	7	48	33.5	21.5	8	16	5	37.5	25.5	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-10-2	Would not let us see this one. She uses it for corn and other foods, but would not let us measure it.	Given to her when her mother died.	—	given	mother	—	—
CHI-10-3	Would not let us see this one. Uses it for coffee grinding only. It was on the floor next to the coffee they had ground on it.	She bought this one in Carcha, but doesn't know when.	—	bought	Carcha market	—	—
CHI-11-1	New, shallow basin, dark basalt.	She bought this one 3 yrs ago when she had sold her other one. A couple of people have said that they have sold theirs, but they always buy another.	3	bought	Carcha market	100	—
CHI-12-1	Only used for corn. It is very old. It barely matches the description of an Eastern style metate. No sides to trough, although a small trough exists and edges are extremely rounded. Fat, stubby legs. Large chips out of both sides.	Given to her by grandmother 10 yrs ago.	10	given	grandmother	—	—
CHI-12-2	Only used for chile when there is chile to be ground. She says this one is old. It has nicely, evenly proportional vesicles. No chile residue visible (red). Dark basalt.	Her mother bought this one a long time ago and used it for grinding coffee.	—	bought	?	—	—
CHI-12-3	Uses it for grinding coffee only when needed. Brown residue from coffee visible. Vesicles are smaller and closer together (millimeters apart and only 1-2 mm in diameter), Left distal leg is missing. I think this is the older one because of its deep trough.	Bought it 7 yrs ago in Tanchi and used it for chile.	7	bought	Tanchi	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-13-1	Eastern	40	46.5	30.5	15	11	9	4.5	36	24	basalt	—
CHI-14-1	Eastern	?	51	33.75	19	10	13	4.75	43	27	basalt	—
CHI-15-1	Eastern	?	48	31.5	17	10	11	5	38	23.75	basalt	—
CHI-16-1	Eastern	20	53	36	18.5	10	1.75	5.5	40	28	basalt	—
CHI-16-2	Eastern	15	—	—	—	—	—	—	—	—	basalt	—
CHI-17-1	Eastern	—	—	—	—	—	—	—	—	—	basalt	—
CHI-17-2	Eastern	—	42	27.25	15	8	9	3	31	20.5	basalt	—
CHI-17-3	Eastern	5	—	—	—	—	—	—	—	—	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-13-1	Dark basalt, classic Eastern style metate, basin is 1-1.5 cm deep.	She bought it in Carcha 45 years ago for Q40.	40	bought	Carcha market	40	Q5 per day
CHI-14-1	Very big, dark gray basalt. Proximal end sits very tall. Perfectly proportioned, wide basin, but very shallow trough (1-2 cm deep).	She bought it from the family of an old neighbor who had died. She got it 2 yrs ago, but it is a lot older than that.	2	bought	neighbor in Chicojl	100	15 per day
CHI-15-1	Normal Eastern shape, dark gray basalt, shallow basin (0.5-1 cm deep), sketch of proximal end included in notes.	Her mother bought it a long time ago in Carcha, so she doesn't know how old it is. Her mother gave it to her 5 yrs ago.	5	given	mother	75	15 per day (5 yrs ago)
CHI-16-1	Used to grind corn. Proximal leg is broken. They say they bought it like that. Very big, deep basin (3 cm deep), dark basalt.	They bought this one 20 years ago in Carcha for Q6.	20	bought	Carcha market	6	Q1 per day
CHI-16-2	Did not measure or see it because it was in storage.	Bought this one in Carcha 15 years ago.	15	bought	Carcha market	8	Q1 per day
CHI-17-1	Used for grinding corn. Would not let us see it.	Bought from a neighbor for Q50.	—	bought	neighbor in Chicojl	50	—
CHI-17-2	Used for grinding coffee and beans. Smaller in length and width than others. Dark basalt. She doesn't know the age of it, but the depth of the basin is about 2 cm deep. (There is a profile drawn in the survey notes done with a contour gauge.)	Bought this one from a neighbor for Q50.	—	bought	neighbor in Chicojl	50	—
CHI-17-3	Not being used. Would not let us see it.	Bought in Carcha 5 yrs ago.	5	bought	Carcha market	100	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-18-1	Eastern	17	45.5	31	17.5	11	11	4.5	35	23.5	basalt	—
CHI-18-2	Eastern	—	—	—	—	—	—	—	—	—	basalt	—
CHI-19-1	Eastern	20	47.5	32	17	10	10.5	4.5	38.5	23.5	basalt	—
CHI-19-2	Eastern	20	48.5	31.5	17	10	11.5	3.5	39	25	basalt	—
CHI-19-3	Eastern	20	—	—	—	—	—	—	—	—	basalt	—
CHI-19-4	Eastern	20	—	—	—	—	—	—	—	—	basalt	—
CHI-20-1	Eastern	7	45.5	31	12.5	3	8.5	8	36	23	basalt	—
CHI-21-1	Eastern	?	46.5	31.5	15	11.5	9.5	4	37	23.5	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-18-1	Used for grinding corn every once and a while, but usually used for coffee grinding. Dark gray basalt, deep vesicles scattered on basin surface and all over metate (.5 cm deep).	This one was given to her by her father who bought it for her 17 years ago and gave it to her 15 years ago.	15	given	father	—	—
CHI-18-2	This one was in the kitchen and she wouldn't let us see it. Preferred for us only to look at the one in the room (metate # 1). It is used all the time for grinding masa and making tortillas.	Bought this one 2 yrs ago from a neighbor.	2	bought	neighbor in Chicojl	100	—
CHI-19-1	Dark basalt, shallow trough (0.5-1 cm deep)	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	20	—
CHI-19-2	Dark basalt, deep basin/trough. It seems like this one is older or was used more than metate # 1. Basin depth- 3 to 3.5 cm deep.	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	—	—
CHI-19-3	In storage, not used and we didn't see it.	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	—	—
CHI-19--4	In storage, not used and we didn't see it.	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	20	—
CHI-20-1	Grinding surface has large holes/vesicles. Maybe it has been repecked.	Bought by her father for her 7 yrs ago in Carcha. This is supposedly the same metate as CHI-16-2, but they said that one was 15 yrs old and this one is only 7 yrs old.	7	given	father	100	—
CHI-21-1	Not used anymore. Never used very much. Sitting up against wall.	Given to her and husband by her father-in-law 2 yrs ago.	2	given	father-in-law	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-21-2	Eastern	8	45.5	31	15	8.5	10	3	37	24	basalt	—
CHI-22-1	Eastern	?	49.5	33.5	20.5	8.5	14.5	3	37	26	basalt	—
CHI-23-1	Eastern	?	47	33.5	19.5	8	14	4	36	25	basalt	—
CHI-24-1	Eastern	?	47	30	15	8.25	9	3	35	23	basalt	—
CHI-25-1	Eastern	?	49	33	15	9	9	3.5	39	26	basalt	—
CHI-26-1	Eastern	?	48	33.5	13	9	18	4	38	25	basalt	—
CHI-26-2	Eastern	?	50	34	18	10	15	4.5	40	25	basalt	—
CHI-27-1	Eastern	?	—	—	—	—	—	—	—	—	basalt	—
CHI-28-1	Eastern	30	47.5	30.75	15	8.5	10	3.5	37	23.5	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-21-2	Shallow basin. This one is used for all grinding and is a classic Eastern style.	They bought this one 2 yrs ago from her father (Ricardo Ba) for Q100. Her father bought it 8 years ago.	2	given	father	—	—
CHI-22-1	Dark basalt, tall proximal end, very smooth basin, edges are beginning to become smooth.	Given to her by her mother 10 yrs ago.	10	given	mother	100	—
CHI-23-1	Rounded corners, basin depth is about 3.5 cm, large chip out of proximal end, proximal leg is chubby and tall.	Given to her 12 yrs ago by her parents.	12	given	parents	—	—
CHI-24-1	Dark basalt, shallow basin, proximal end is sitting on a post (like those found at Ceren, El Salvador). Chips off each side of the basin of the metate.	Given to her by her father 3 yrs ago for when she got married. Her father bought it long before she was married, but she doesn't know when.	3	given	father	—	—
CHI-25-1	Very old, dark basalt, very large.	It belonged to her father 50 years ago, and when he died, she inherited it.	50	given	father	—	—
CHI-26-1	Used for grinding corn, basin is still shallow, made of dark basalt.	Given to her by her parents 40 yrs ago.	40	given	parents	—	—
CHI-26-2	Used for grinding coffee, very large, Covered in ground coffee residue. Dark basalt, 2-3 cm basin depth.	Given to her by her parents 40 yrs ago. Doesn't know exact age.	40	given	parents	—	—
CHI-27-1	Would not allow us to see it or enter the kitchen.	Given to her mother by her grandfather (her mother's father).	2	given	grandfather	—	—
CHI-28-1	Dark gray basalt, classic Eastern style, shallow basin (1-2 cm deep)	Bought 30 yrs ago in Carcha for Q9.	30	bought	Carcha market	9	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-29-1	Eastern	3 months	46	31.5	17	8	11.5	3	37	24.5	basalt	—
CHI-30-1	Eastern	12	47	31.5	16	10.5	10.5	4.5	37	23.5	basalt	—
CHI-31-1	Eastern	?	48	31	9.5	16	4	10.5	38	23.5	basalt	—
CHI-32-1	Eastern	?	50	36.25	20	9.5	13	4	41	29	basalt	—
CHI-33-1	Eastern	“old”	—	—	—	—	—	—	—	—	basalt	—
CHI-33-2	Eastern	8	48.5	31	18	9	12	4	36	23.5	basalt	—
CHI-34-1	Eastern	155	57	41	18	10	12	3.5	46	30	basalt	—
CHI-34-2	Eastern	25	48	31.5	17	10.5	10	4	38	24	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-29-1	Brand new metate, basin depth is 1 cm, dark basalt, still sharp edges, which is a sign that it is new and hasn't been handled very much.	She and her husband bought it 3 months ago when she moved out of her parents house and moved with her husband up the hill to their own house.	3 mon.	bought	Carcha market	120	Q20 per day
CHI-30-1	Basin depth- 0.5-1 cm deep. Still looks new, classic Eastern style, edges of basin are still very squared and sharp, dark basalt.	Bought it 12 yrs ago when she moved out of her parent's house.	12	bought	Carcha market	75	Q10-15 per day
CHI-31-1	Basin depth: 2-2.5 cm deep, dark basalt, classic Eastern, distal leg width appears very small.	Her father bought it for them. He gave it to them 20 years ago.	20	given	father of wife	—	—
CHI-32-1	Very big, left distal leg broke when the kids dropped it. Shallow basin (1.5-2 cm deep).	Given to them 30 years ago by her mother-in-law. She doesn't know when her in-laws bought it, but knows it is pretty old.	30	given	mother-in-law	—	—
CHI-33-1	Would not let us see kitchen or metate.	Her father gave this one to them 40 yrs ago. It is a "*najter ka'*," but she does not know how old.	40	given	father	—	—
CHI-33-2	Only used for grinding coffee. Shallow basin with sharply cut edge (basin depth-—.5-1.5 cm deep).	They bought this one from a neighbor lady 8 yrs ago and it is used for coffee.	8	bought	neighbor in Chicojll	200	—
CHI-34-1	Very large metate. They use it for grinding coffee, so it is dark from residue of roasted coffee beans. One large hole in proximal, center part of basin. Basin: 2.5-3 cm deep. Basin is very smooth.	They traced this one back to his great-great grandmother (the grandmother of his mom who still lives with them) who walked to San LuisJilotepeque to buy it. He estimated it to be about 155 years old.	?	given	grandmother	—	—
CHI-34-2	Chipped on proximal end of basin. Basin depth: 1-2 cm. Used for grinding corn.	His father bought this one about 30 years ago.	25	given	father	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
CHI-34-3	Eastern	1	46.5	31	16	9.75	10.5	4	38	23	basalt	—
CHI-35-1	Eastern	100+	—	—	—	—	—	—	—	—	basalt	—
CHI-35-2	Eastern	45	47.5	31	17	11	11	3.75	39	23	basalt	—
CHI-36-1	Eastern	100+	45	32	18.5	8.5	10	2	33	23.5	basalt	—
CHI-36-2	Eastern	34	47.5	30.5	16.5	9	10	3.5	39	23.5	basalt	—
IXT-01-1	Western	75+	44.5	35.5	21.5	13	13	7.5	34	35.5	basalt	*rax abaj* (green rock)
IXT-01-2	Western	18	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-02-1	Western	5	45.5	35.5	22	18	15	9.5	35	35.5	basalt	*rax abaj*

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-34-3	Still new and linear peckings of metateros can still be seen on basin. It is used for grinding corn.	Bought in Carcha 1 year ago.	1	bought	Carcha market	—	—
CHI-35-1	In storage, so I didn't get to measure it, although I could see it from afar. Classic Eastern.	Given to him from father 40 yrs ago. He thinks that it is more than 100 yrs old.	40	given	father	—	—
CHI-35-2	Basin depth: 1-2 cm thick. Dark basalt.	Bought in Carcha 45 yrs ago.	45	bought	Carcha market	11	.40 a day
CHI-36-1	Thick basin. Deep trough (3-4 cm), rounded corners and worn edges. Looks very old. Short stubby distal legs, used for corn grinding.	Given to her by her father. Doesn't know how old it is. Approximately 100-150 yrs old.	—	given	father	—	—
CHI-36-2	Sits high on the right proximal side. This one was in storage and they don't use it. 1.75 cm basin depth.	Bought 34 years ago.	34	bought	—	50	.50 per day 34 yrs ago
IXT-01-1	Used to grind corn everyday (final grind only). Dark basalt. Corn residue on surface.	Given to her by mother 75 yrs ago.	75	given	mother	—	—
IXT-01-2	Used to grind corn. Not used as much. Also used for chile.	Bought 18 yrs ago in Nahualá.	18	bought	Nahualá market	125	Q15-20 per day
IXT-02-1	Used for grinding corn (toased and nixtamal), biggest of the three in this house, and does not have much of a grinding angle from proximal to distal end on basin.	Bought 5 yrs ago in Nahualá.	5	bought	Nahualá market	80	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-02-2	Western	3	39.5	31.25	16.5	11	9	4	30	31.25	basalt	*rax abaj*
IXT-02-3	Western	1	30	23	16.5	11	10	5.5	24	23	basalt	*rax abaj*
IXT-03-1	Western	?	41.5	33.5	21	10.5	15	5	34	33.5	basalt	*rax abaj*
IXT-03-2	Western	10-15	42	32.5	26.5	17.5	20.5	11.5	33	32.5	basalt	*rax abaj*
IXT-03-3	Western	5	34.5	24.5	17.5	10.5	11	5	25	24.5	basalt	*rax abaj*
IXT-03-4	Western	8-10	32	25.5	17.5	11.5	12	5	22	25.5	basalt	*rax abaj*
IXT-04-1	Western	?	40	31.5	21	13.5	15	9	30	31.5	basalt	—
IXT-05-1	Western	?	42	33.5	20	15	14	8	32	33.5	basalt	—
IXT-05-2	Western	18	—	—	—	—	—	—	—	—	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-02-2	Used for coffee. Proximal to distal angle more severe than metate # 1. Very slight curve in basin.	Bought 3 yrs ago in Nahualá.	3	bought	Nahualá market	75	—
IXT-02-3	Used for chile, tomato, achiote. Stained red all over basin and sides from chile and achiote. Small metate.	Bought 1 year ago in Nahualá market.	1	bought	Nahualá market	40	—
IXT-03-1	Oldest one, used only for corn, short distal legs, tall proximal leg.	Given to her 25 years ago by her mother. She doesn't know its actual age.	25	given	mother	—	—
IXT-03-2	Very tall, tall proximal leg which is bullet shaped.	Bought 10-15 yrs ago in Nahualá. Used just for grinding corn.	10-15	bought	Nahualá market	60	—
IXT-03-3	Covered in achiote residue, red all over. It looks like only 25 cm of the length of the basin is used for grinding. Chubby proximal leg and short, stubby distal legs.	Bought 5 yrs ago. Used for chile, achiote, and tomato grinding.	5	bought	Nahualá market	45	—
IXT-03-4	Smaller and covered in coffee residue.	Bought 8-10 yrs ago for Q40 in Nahualá.	8-10	bought	Nahualá market	40	—
IXT-04-1	Curved basin, a depression in the stone is present at left distal end; covered in corn residue; basin/grinding surface is 10 cm smaller in circumference than the size of the whole basin.	Given to her 10 yrs ago by her grandparents.	10	given	grandparents	—	—
IXT-05-1	Used just for corn. They use it daily to make corn finer (last grind). Corn residue on basin, dark basalt.	Given to them 17 yrs ago by grandparents.	17	given	grandparents	—	—
IXT-05-2	They wouldn't take this one out. It is used for *recado*.	Bought 18 yrs ago in Ixtahuacán.	18	bought	Ixtahuacán market.	25	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-06-1	Western	12	36	28	18.5	16.5	13	10	30	28	basalt	*rax abaj*
IXT-06-2	Western	15	—	—	—	—	—	—	—	—	basalt	—
IXT-06-3	Western	2	—	—	—	—	—	—	—	—	basalt	—
IXT-07-1	Western	?	39	29.5	18	10.5	13.5	7	29	29.5	basalt	*rax abaj*
IXT-07-2	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-08-1	Western	2	42	34.5	22.5	11	16	8	34	34.5	basalt	—
IXT-08-2	Western	1	—	—	—	—	—	—	—	—	basalt	—
IXT-09-1	Western	18	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-09-2	Western	2 months	—	—	—	—	—	—	—	—	basalt	*rax abaj*

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-06-1	Smaller than others, corn residue visible, edges chipped up a bit, made of dark basalt.	Bought 12 yrs ago in Raxquim.	12	bought	Raxquim	10	—
IXT-06-2	Would not let us see or measure it. They say it is used for *recado*.	Bought 15 yrs ago in Raxquim.	15	bought	Raxquim	10	—
IXT-06-3	Would not let us see or measure it. They say it is used for grinding corn.	Bought 2 yrs ago in Raxquim.	2	bought	Raxquim	5	—
IXT-07-1	Very smooth basin, corn and *recado* residue on grinding surface. Left distal end is lower than opposite side. Used mostly for corn.	It was given to them by grandparents. This lady is about 80 years old, so I estimate this metate to be about 150 yrs old.	60	given	grandparents	—	—
IXT-07-2	It is used for *recado*, but they would not let us see it.	Didn't tell me age. They were real reluctant to give information. I think they wanted to say that both metates and manos were given to them from their grandparents, but they weren't really clear. No certain age.	—	—	—	—	—
IXT-08-1	Very square basin with little damage. Proximal left corner chipped off a little.	Bought in Nahualá 2 yrs ago.	2	bought	Nahualá market	150	—
IXT-08-2	Used for *recado*. Wouldn't let us see it.	Bought in Nahualá 1 yr ago.	1	bought	Nahualá market	40	—
IXT-09-1	Would not let me measure because of "measuring *awas*." Classic Western style, used only for corn grinding every once in a while.	Given to her by grandparents.	?	given	grandparents	—	—
IXT-09-2	Would not let me measure because of "measuring *awas*." Used for *recado*, brand new, they barely use it.	Bought in Nahualá 2 months ago.	2 mon.	bought	Nahualá market	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-09-3	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-10-1	Western	?	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-10-2	Western	?	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-10-3	Western	?	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-10-4	Western	6	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-11-1	Western	?	45	35.5	22.5	12	16	7	35	34.5	basalt	*rax abaj*
IXT-11-2	Western	?	—	—	—	—	—	—	—	—	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-09-3	Would not let me measure because of "measuring *awas*." Used for coffee every once and a while. This one looks very old. Right side of basin has a 5-7 cm chunk taken out of it.	Given to them by granparents very recently. Don't know how old it is.	?	given	grandparents	—	—
IXT-10-1	Would not let me measure because of "measuring *awas*." Classic Western style, very large. Used for grinding corn.	She got it from her mother and it was always in her mother's home for as long as she could remember.	—	given	mother	—	—
IXT-10-2	In storage and she would not let me measure because of "measuring *awas*." Used to grind coffee.	Mother gave it to her.	—	given	mother	—	—
IXT-10-3	In storage and would not let me measure because of "measuring *awas*." Used to make *recado*.	From her mother as well. She doesn't know the age or price on this one either.	—	given	mother	—	—
IXT-10-4	Would not let me measure because of "measuring *awas*." This was bought second-hand. Used to grind corn when there is no room in kitchen.	Bought in Nahualá as a second-hand metate.	6	bought	Nahualá market	60	—
IXT-11-1	The surface is almost convex. It was sitting on the floor with achiote and corn residue on it. Distal ends (corners especially) are rounded. All legs have one flat side to edge of metate. Used for corn grinding.	Given to her by her grandparents.	?	given	grandparents	—	—
IXT-11-2	It was in storage and we could not view it for measurements or description. Used for *recado*.	Given to her by her grandparents.	?	given	grandparents	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-12-1	Western	6-7 yrs	43	33	18.5	13	12.5	6.5	35	33	basalt	*rax abaj*
IXT-13-1	Western	?	39	31.5	21	17	14	11	32	31.5	basalt	*rax abaj*
IXT-13-2	Western	3	26	18	10	7	5	3	26	18	basalt	*rax abaj*
IXT-14-1	Western	15	See photo	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-14-2	Western	30	See photo	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-14-3	Western	50	39.5	30.25	21	10	13	5	33	30.25	basalt	*rax abaj*
IXT-15-1	Western	?	41.5	33	20	15.5	13	10	32	33	basalt	*rax abaj*

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-12-1	The distal legs look like an Eastern style metate's. Only 6-7 years old, so not much patination or wear.	Bought 6-7 years ago in Nahualá	6-7	bought	Nahualá market	50	—
IXT-13-1	It is very worn where hands hold mano (dog-bone shape). This is a classic Western style made of dark basalt and has a very smooth surface indicating much use or old age.	Given to her by her mother about 10 years ago.	10	given	mother	75	—
IXT-13-2	It is used for making *recado*. It is quite small in comparison to others seen and covered in achiote residue.	Bought 3 years ago in Nahualá.	3	bought	Nahualá market	20	—
IXT-14-1	Small metate covered in achiote residue.	Bought in Nahualá 15 yrs ago for Q1.50	15	bought	Nahualá market	1.50	—
IXT-14-2	This is the biggest of the three. The grinding surface is very smooth and this metate is used the most. It has bean, coffee, and corn residue on the surface.	Bought in Nahualá 30 yrs ago.	30	bought	Nahualá market	50	—
IXT-14-3	This one appears to be very old and is still rough considering they haven't resurfaced it lately. It is a classic Western style metate.	Given to her by her mother 40 yrs ago.	40	given	mother	—	—
IXT-15-1	Classic Western style made of dark basalt. Tall distal legs. Proximal leg was sitting on a "*piedra de oyo*." I am not sure if this was common to use before or if it was only reused this way.	Bought it from her mother about 50 yrs ago.	—	bought	mother	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-15-2	Western	12	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-15-3	Western	12	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-16-1	Western	?	40	29.5	21	13	15	7	40	29.5	basalt	—
IXT-16-2	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-16-3	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-16-4	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-17-1	Western	1	23	17.5	12	9	8	5	18	17.5	basalt	—
IXT-18-1	Western	?	45	30	23	16	15.5	10	33	35	basalt	*rax abaj*

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-15-2	In storage and was not able to measure it. Used to grind *recado*.	Bought in Nahualá 12 yrs ago for Q50.	12	bought	Nahualá market	50	—
IXT-15-3	In storage and was not able to measure it. Used for grinding coffee.	Bought in Nahualá 12 yrs ago for Q50.	12	bought	Nahualá market	50	—
IXT-16-1	Sits at a very large incline. Covered with corn residue and basin is rough. Used to grind corn.	Bought for Q80.	—	bought	Nahualá	80	—
IXT-16-2	In storage and was not able to measure it. Used for grinding *recado*.	Given to her by her grandmother who bought it a long time ago.	—	given	grandmother	—	—
IXT-16-3	In storage and was not able to measure it. It is used for grinding coffee. It has no distal legs and is about the same size as metate #1 in this house.	His grandmother bought this one.	—	given	grandmother	—	—
IXT-16-4	Used for grinding coffee and chile. It was the distal broken end of a small metate. They were also using a small broken mano (IXT-16-3 manos) to grind on it.	Also bought by his grandmother.	—	given	grandmother	—	—
IXT-17-1	Used for grinding *recado*. Slight convex curvature in grinding basin. Covered in red achiote residue.	She bought it in Nahualá 1 yr ago for Q15.	1	bought	Nahualá	15	—
IXT-18-1	This one is used for grinding corn. It appears to be very old and worn, especially in the grinding basin; basin has a very curved surface. Proximal leg is set on a "*chunteel*" for elevation when grinding.	She received it from her mother when she was 30 yrs old and when she left the house as a newlywed. The mano and metate were originally given to her mother by her great-grandparents.	30	given	mother	—	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-18-2	Western	?	—	—	—	—	—	—	—	—	basalt	*rax abaj*
IXT-19-1	Western	1	—	—	—	—	—	—	—	—	basalt	—
IXT-19-2	Western	1	—	—	—	—	—	—	—	—	basalt	—
IXT-19-3	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-19-4	Western	100+ (4 generations)	46	35.5	26	11	19	6.5	37	35.5	basalt	*rax abaj*
IXT-19-5	Western	1	—	—	—	—	—	—	—	—	basalt	—
IXT-20-1	Western	?	41	32	20	16	13	10	34	32	basalt	*rax abaj*
IXT-20-2	Western	—	—	—	—	—	—	—	—	—	basalt	—
IXT-20-3	Western	2	—	—	—	—	—	—	—	—	basalt	—
IXT-21-1	Western	4	40.5	30	24	11	18	6	33	30	basalt	*rax abaj*

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-18-2	Used for grinding achiote/*recado*. It is a smaller one and is covered in red achiote residue. It also has a worn basin.	This one was also given to her by her mother when she left the house 30 yrs ago with her husband.	30	given	mother	—	—
IXT-19-1	In storage.	Bought in Nahualá about 1 year ago for Q100.	1	bought	Nahualá market	100	—
IXT-19-2	In storage.	Bought used from a neighbor in Ixtahuacán about 1 yr ago for Q175.	1	bought	neighbor (Ixtahuacán)	175	—
IXT-19-3	In storage.	Brought to Antigua Ixtahuacán by her mother long ago. (She is about 85 yrs old herself.)	—	given	mother	—	—
IXT-19-4	Very large, curved basin. Appears to be quite old. If looked at from above, the metate does not seem to be completely square. Very large proximal leg.	Brought to Antigua Ixtahuacán by her mother long ago. (She is about 85 yrs old herself.)	?	given	mother	—	—
IXT-19-5	In storage. They also once had a *chunteel* at one time. Used for grinding achiote/ *recado*.	Bought in Nahualá about 1 year ago for Q30.	1	bought	Nahualá market	30	—
IXT-20-1	Proximal leg looks short. It looks like it lost its point/tip. They say this is the oldest of the three. Left distal corner has been chipped. It is used to grind corn.	Given to her by her mother 10 yrs ago.	10	given	mother	—	—
IXT-20-2	In storage.	Given to her by her mother 10 yrs ago.	10	given	mother	—	—
IXT-20-3	In storage.	Bought 2 yrs ago in Nahualá for Q75.	2	bought	Nahualá market	75	—
IXT-21-1	Very tall proximal leg. Basin has a very large slope and is slightly curved (convex).	4 yrs ago, her mother-in-law bought it for them for Q75.	4	given	Mother-in-law	75	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
IXT-21-2	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-21-3	Western	8	—	—	—	—	—	—	—	—	basalt	—
IXT-21-4	Western	8	—	—	—	—	—	—	—	—	basalt	—
IXT-22-1	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-22-2	Western	15 days old	37	26	22	17	15.5	10.5	27	26	basalt	*rax abaj*
IXT-23-1	Western	?	24.5	20	12	6	7	2.5	18.5	20	basalt	—
IXT-23-2	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-23-3	Western	?	—	—	—	—	—	—	—	—	basalt	—
IXT-24-1	Western	?	41	29	23	14	14	6.5	31	29	basalt	—
PAN-01-1	Eastern	90	54	34	18	11	12	5.5	45	27.5	basalt	*rax abaj*
PAN-02-1	Eastern	67	47	30.5	15	7.5	11	3.5	42.5	31.5	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
IXT-21-2	In storage. Used for achiote/*recado*.	Bought 5 yrs ago for Q20 in Antigua Ixtahuacán.	5	bought	neighbor	20	—
IXT-21-3	In storage.	Bought 8 yrs ago in Nahualá for Q150.	8	bought	Nahualá market	150	—
IXT-21-4	In storage.	Bought 8 yrs ago in Nahualá for Q150.	8	bought	Nahualá market	150	—
IXT-22-1	In storage.	Given to her by her mother 5 months ago when she and her family moved to this house.	5 mon.	given	mother	—	—
IXT-22-2	Brand new, made of light gray basalt. Basin is not worn at all and is still very rough with clean cut edges.	Bought 15 days ago in Nahualá for Q75.	15 days	bought	Nahualá market	75	—
IXT-23-1	This is a smaller metate used for grinding *recado*/achiote. It has a very flat basin.	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-23-2	Very thin basin and very curved. Used to grind corn.	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-23-3	In storage. Used for coffee.	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-24-1	Very wide and tall proximal leg. Stubby distal legs. Basin is slightly curved.	Given to her by her father. She thinks the metate might be as old as her great-grandmother.	—	given	father	—	—
PAN-01-1	A few large pits (about 1/3 cm deep) in basin at distal end. Heavy patination at distal end.	Given to her by her mother-in-law who received it from her mother. (3 generations).	35	given	mother-in-law	—	Q15 (35 yrs ago)
PAN-02-1	Shallow trough.	Given to them by mother who received it from her father when she left their home with her husband. Alejandro Ca'al (interviewee's grand-father) bought it 67 years ago for his house when he was 7 years old for Q3.	26	given	mother	3	.5 (67 yrs ago)

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-03-1	Eastern	11	46	31	14.5	9	9	3.5	41.5	24.5	basalt	*pec*
PAN-04-1	Eastern	90	47	31	17	10	11.5	5	43	24.5	basalt	—
PAN-05-1	Eastern	10	52	36.5	20	14	14	7	46	28	basalt	—
PAN-06-1	Eastern	25	39	26	14.5	8.5	9	4	32	21	basalt	—
PAN-06-2	Eastern	25-30	45	31.5	15.5	8	9.5	3.5	39	25.5	basalt	—
PAN-07-1	Eastern	10	47.5	31.5	10	3	16	9.5	41	23	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-03-1	Lighter gray color; proximal leg sitting in a post and distal legs on table.	Bought 11 years ago in Tucuru, Alta Verapaz from Cahua Chino, the only person that sells them in Tucuru.	11	bought	Cahua Chino/Tucuru	110	Q7.5 (11 years ago)
PAN-04-1	Very used, surface extremely shiny, rough sides, looks battered and older, medium color gray.	Received it 5 yrs ago from father and mother (Josefina Chup). She didn't have enough money to buy one so her father had bought 3 a long time ago and gave one to the kids (boys). She says they are usually only for the boys.	5	given	Father	—	—
PAN-05-1	Basin is smooth with a large pit in the center.	They bought it 10 years ago when they left their family's house. (Alejandro Ca'al's home)	10	bought	Teleman market	160	Q5 a day (10 yrs ago)
PAN-06-1	Light gray, smaller size than others, center of basin appears to be smooth and worn. Right corner of distal end is broken (chipped). The mano that was originally bought with this metate broke and one granddaughter threw it out in the brush and lost it.	This small metate was bought for her daughters to learn on.	25	bought	Tucuru	2	.25 a day (25 yrs ago)
PAN-06-2	Smooth surface (basin), dark gray basalt, chips on proximal end of basin.	Bought 25-30 yrs ago after their home burnt down. The one that burned was bought by Rosa when she was 20 yrs old before she was married.	25	bought	Tucuru	3	.25 a day (25 yrs. ago)
PAN-07-1	Center of grinding surface is very smooth and 5 cm of distal end is very shiny. Dark gray basalt.	Jose Alberto Pop- Marta's husband- bought it when he was young in the Tucuru market. His mother died and his father deserted them and so he moved in with his brother and sister-in-law. That is when he bought the metate. It was before he married Marta.	10	bought	Tucuru	50	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-08-1	Eastern	—	47.5	31	16	9	10.5	4.5	41.5	24	basalt	—
PAN-09-1	Eastern	3	47	32	14	9	9	4	40	25	basalt	—
PAN-10-1	Eastern	—	49.5	31.5	17.5	9	12.5	4.5	44	41..5	basalt	—
PAN-10-2	Eastern	—	48	32	16	9.75	10	4	43	24.5	basalt	—
PAN-11-1	Eastern	10	45.5	30	14	7.5	12	8.5	40	23.5	basalt	—
PAN-12-1	Eastern	30	48.5	31.5	15	7.25	9.5	4.25	45	24	basalt	—
PAN-13-1	Eastern	6	46.5	30.5	16	10	10	4.25	41	23	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-08-1	Stone looks older. Bottom and outer edges are very well carved and edges are sharp and not chipped. Dark basalt with small, compact vesicles.	His father bought it many years ago and gave it to him (Alejandro-interviewee) when he left the house to live with his girlfriend (not married).	15	given	Father	50	—
PAN-09-1	Dark gray basalt. Surface is pitted, but she says it is getting too smooth and will be repecked soon.	She bought it 1-3 years ago in Tucuru from Don Chino.	3	bought	Tucuru- Don Chino	75	—
PAN-10-1	Appears to be well worn in the middle of the basin. A lot thinner between grinding surface and bottom than other metates seen.	Given to her by father 8 years ago. Not sure of age or how much it cost.	8	given	father	—	—
PAN-10-2	This one is not in use because she says they only need one. This is her father's and looks like it has been repecked and not used for a while. It was being stored in a bag on a table (in a coffee bag) in the main/front room.	Her father had bought this one "*najter/junxil*" (anciently/a long time ago).	8	given	father	—	—
PAN-11-1	Brownish color, well-defined trough walls.	Bought it in Coban market 10 years ago.	10	bought	Coban market	100	15
PAN-12-1	Older, dark basalt. Trough is about 2 cm deep; this is deeper than most. The metate is chipped at distal end.	Bought by her parents 30 years ago for themselves and gave it to her daughter 18 years ago.	18	given	mother	3	—
PAN-13-1	It was up against the wall when I came in, but he said that they use it with the other one. With 13 mouths to feed, I'm sure it is needed. Dark gray, still quite rough.	This one was bought for his daughter 6 years ago and now that she is married, when she moves, she can take it with her. It was bought in the Tucuru market.	6	bought	Tucuru market	125	10

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-13-2	Eastern	8	47	31.5	15.5	10	9.5	5	42	23	basalt	—
PAN-14-1	Eastern	15	47.5	31.5	15	6.5	9.5	4	40	25	basalt	—
PAN-14-2	Eastern	20	48	31.5	15	7	10.5	4	41.5	24.5	basalt	—
PAN-15-1	Eastern	35	48	31	16	10	10	4	40	23	basalt	—
PAN-16-1	Eastern	44	47.5	31	16.5	10.25	11.5	5	41	24	basalt	—
PAN-17-1	Eastern	10	46	30.5	15.5	8	10.5	3.5	25	23	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-13-2	Vesicular basalt. Feels smoother than the other one and the vesicles are not as deep, suggesting more use (or harder stone). It was in position to be used. He said that they resurfaced/repecked it 6 months ago.	He bought it 8 years ago in Tucuru market when his mother took back the one she let him borrow.	8	bought	Tucuru market	125	10
PAN-14-1	Dark basalt with deep pits. He said that little rocks in the the little holes/pits popped out when they were grinding, so that is why there are several deep pits.	Bought it in Tucuru 15 years ago.	15	bought	Tucuru market	115	.50 day/ 20 yrs ago
PAN-14-2	Left hand side has a big chunk broken out of it. The left distal corner is also broken off. 3/4 of the grinding surface, within the trough, is smooth with signs of heavy usage.	He bought this one first 20 yrs ago, but five years in, the side of it busted off, so he bought metate #1. Then the holes appeared on metate #1 and he went back to this one and uses it now.	20	bought	Tucuru market	120	.50 day/ 20 yrs ago
PAN-15-1	Dark gray basalt with a shallow trough. Some chipped pieces on right hand side of distal end.	This one was bought after their house burned down. The one before this one was 40 yrs old, but they didn't salvage it.	35	bought	Tucuru market	20	.25
PAN-16-1	Dark gray basalt. Medium-shallow trough.	He bought it when he was 13 yrs old when he "found" a woman. They married 35 years ago.	44	bought	Tucuru market	35	.20
PAN-17-1	The guide kept saying that this metate was small. Dark gray with linear vesicles. The basin measurements are according where she was grinding her nixtamal; only small area used.	Bought it 10 years ago when he left his parents' home.	10	bought	Tucuru market	120	Q10 per day

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-18-1	Eastern	16	47.5	31	16	9.5	11	4.25	37	23	basalt	—
PAN-19-1	Eastern	5	47	31	15.5	10	9.5	5	40	22	basalt	—
PAN-20-1	Eastern	50	46.5	32	18	10.5	13	6	39	24	basalt	—
PAN-20-2	Eastern	20	47	31	17	8.5	10	3.5	39	23.5	basalt	—
PAN-21-1	Eastern	10 months	46.5	32	16	8.75	10	3.5	40	23.5	basalt	—
PAN-21-2	Eastern	7	47	30.5	14.5	8.5	9.5	5	39	23	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-18-1	Dark gray. Horizontal peckings on basin are filled with corn dough residue.	Her mother-in-law gave her and husband one when they married, but they sold it and bought this one.	16	bought	Tucuru market	11	—
PAN-19-1	Newer metate that is thick between the basin and bottom. Can still see the lateral peckings made by the metatero. Shallow trough.	Bought in Tucuru 5 yrs ago.	5	bought	Turucu market	130	10 per day
PAN-20-1	Was lying on legs, in place, ready to use. Some larger pits/vesicles in basin surface. Chips on left hand proximal side. Very deep trough.	They bought it 50 years ago in Tucuru.	50	bought	Tucuru market	11	—
PAN-20-2	Not used as much, although she says she uses it everyday. Deep vesicles all over. Looks like it was made from a very poor, porous stone. Dry corn residue all over. Found leaning up against wall. Shallow trough.	Bought it 20 years ago for when next child was to leave the house.	20	bought	Tucuru market	20	—
PAN-21-1	Dark basalt, not used very much. It was under a bunch of clothes and upside down on the table. It has a little bit of a red residue and I can see on the distal end where concrete was put in some of the bigger holes.	She just bought it last year (2003).	10 mon.	bought	Tucuru market	100	—
PAN-21-2	Dark gray basalt, some linear depressions on sides. Sides of metate are also at a very long slope, rather than deep and abrupt.	Bought 7 yrs ago in Tucuru market.	7	bought	Tucuru market	120	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-22-1	Eastern	150? (3 generations)	47.5	33.5	16	11	10	6.5	40	24.5	basalt	—
PAN-23a-1	Eastern	—	49	31.5	15.5	10.5	10.5	5	41	23	basalt	—
PAN-23b-1	Eastern	75-100	48.5	31	15	9	9.5	3.5	41	24	basalt	—
PAN-24-1	Eastern	40	48	31.5	15	9.75	9.5	3.5	40	23.5	basalt	—
PAN-25-1	Eastern	—	38	28.5	19	12	12.5	6	34	22.5	basalt	—
PAN-26-1	Eastern	50	48	32	16	6	11.5	2.5	38	25	basalt	—
PAN-26-2	Eastern	6	49.5	32.5	16	10.5	10.5	3.5	43	23	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-22-1	Large and old. The trough is very deep (4 cm in the deepest place). Dark gray basalt, rounded corners, feet are also well rounded. The trough is so deep that when the mano sits inside, top of the mano is even with the sides of metate.	—	—	—	—	—	—
PAN-23a-1	Dark basalt with a few vesicles on grinding surface that are much larger than others (1.5-2 cm in diameter).	Given to them 8 yrs ago by her husband's parents. She doesn't know how old it is.	8	given	in-laws (husband's parents)	—	—
PAN-23b-1	Deep trough, dark basalt, high sheen/patination, distal left corner chipped, and all corners rounded.	It was given to them by the wife's father who bought it 75-100 years ago.	10	given	father-in-law	8	—
PAN-24-1	Normal, dark basalt.	Bought it 40 years ago in Carcha.	40	bought	Carcha market	5	.015 of a quetzal
PAN-25-1	This is a different variation of the Eastern style. It is troughed/restricted, but the distal legs don't sit at an angle. The legs are also really fat/pudgy.	Her husband bought it a while back, but she doesn't know when or where. It was stolen at one time, but she found it in the woods without the mano. They found a mano somewhere and are using it to grind. See mano #1.	—	bought	—	—	—
PAN-26-1	Slightly broken on right proximal side, very smooth/patinated. It is used everyday.	The father bought it 50 yrs ago.	50	bought	Tucuru market	25	—
PAN-26-2	Thicker due to age; dark basalt.	Bought 6 yrs ago.	6	bought	Tucuru market	150	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-27-1	Eastern	15	48.5	31.5	12.5	7	3.5	3	39	24	basalt	—
PAN-28-1	Eastern	20	48.5	30.5	15.5	8	11	4	41	23.5	basalt	—
PAN-29-1	Eastern	15	48	31.5	16	8	10	4.5	41.5	23.5	basalt	—
PAN-30-1	Eastern	50	48	30.5	14	10	8	4.5	39	23.5	basalt	—
PAN-31-1	Eastern	5	47	31	15	8.51	9.5	3.5	40	23	basalt	—
PAN-32-1	Eastern	40	54	35.5	14	14	8	7	43	27.3	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
PAN-27-1	Lighter gray basalt. Looks like there are either small quartz inclusions or mica (small shiny specs). Proximal leg has been broken off because the metate fell. It is sitting on a brush to lift it up.	Her mother/father bought them this metate 15 years ago when they moved out of her house.	15	given	mother/father	60	Q10 per day
PAN-28-1	Dark basalt, one distal leg is longer than the other.	Her mother gave her this metate 15 yrs ago.	15	given	mother (who bought it in Tucuru)	—	—
PAN-29-1	Lighter gray basalt with many vesicles.	He bought it when he was 14 yrs old. When he was 17, he got married and already had it. He did this to prove his independence before he was married.	15	bought	Tucuru market	75	Q1.50 per day
PAN-30-1	The grinding surface is quite deep. Vesicles seem to run in a linear "grain."	She got it from her mother when she left her parent's house with her husband. She actually switched with her mother's metate because she had bought one and it was too small.	11	given	mother	3	—
PAN-31-1	Looks a lot older than she says. Dark gray basalt. Some damage on outside edges of basin walls.	Bought it in Tucuru market 5 years ago for Q100.	5	bought	Tucuru market	100	—
PAN-32-1	Very big, and maybe the biggest one I've seen yet. Proximal and distal heights are the same size because proximal leg is broken. Smooth grinding surface in basin. Deep trough that ends abruptly at distal end 5-6 cm before the end of the basin.	At about 20 years old, her mother, who currently lives with her, bought it before she (the mother) had children. Her mother is now 60 years old, although she looks a lot older.	40	bought	Tucuru market	20	—

Table 4. Metate data summary continued.

House/Metate Number	Type	Age (years old)	Length	Width	Proximal height	Distal height	Proximal leg height	Distal leg height	Basin length	Basin width	Stone type (English)	Stone type (Native Lang)
PAN-33-1	Eastern	50	47.5	31	13.5	9	8	4.5	40	23	basalt	—
PAN-34-1	Eastern	50	47.5	30.5	13	8.5	6	3.5	42	23	basalt	—
PAN-35-1	Eastern	40	40.5	31	17.5	10	10	4	38.5	23.5	basalt	—
PAN-35-2	Eastern	30	47	32	17	11	11	5.5	37	23	basalt	—
PAN-35-3	Eastern	4	47	31	14.5	11	10	5	39	23	basalt	—
PAN-36-1	Eastern	7	46.5	30.5	15.5	9.5	9	4	39	22	basalt	—

Table 4. Metate data summary continued.

House/Metate Number	Physical Description/Uses	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor
PAN-33-1	Dark gray, proximal leg is broken at the tip.	Bought 50 years ago in Tucuru market.	50	bought	Tucuru market	—	—
PAN-34-1	Proximal leg is broken, dark basalt, trough is not very deep.	Bought in Tucuru market 50 years ago.	50	bought	Tucuru market	35	—
PAN-35-1	Dark basalt, normal and trough not very deep.	Given to her only 6 months ago by her mother who is too sick to use it.	6	given	mother	3	—
PAN-35-2	It sits up against the wall on a table and is only used to grind toasted coffee. Trough is about 1.5 cm deep. See mano #2 description.	She bought this one 30 years ago.	30	bought	Tucuru market	20	—
PAN-35-3	Used to get coffee beans out of skin. Significant amount of coffee skin residue on grinding surface. Still looks very new. Sides of trough were cut at almost a 90 degree angle- this may indicate how new it is.	She bought this one about 4 years ago for when her son marries and moves out.	4	bought	Tucuru market	110	—
PAN-36-1	Looks new, dark basalt, vesicles are quite small and close together. This is the kind of stone metateros say is very good stone.	She got it from her mother who bought it 7 years ago for her, most likely when she got married.	7	bought	Tucuru/given by mother	110	—

Table 5. Mano data summary from Form B.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-01-1	Eastern	100-150	26.75	7	4.25	basalt	—	Very long, 2-sided. *Poch'oc* side was very rounded. Overall, the mano is very thin and is the original mano that went with this metate.
CHI-02-1	Eastern	—	26	6.25	4.75	basalt	—	Profiles drawn in notes.
CHI-02-2	Eastern	—	29	6.75	5	basalt	—	This is a big mano. 2-sided, *hesoc*/*litz'oc* side is worn very smooth with very small vesicles exposed.
CHI-02-3	Eastern	—	—	—	—	basalt	—	In storage and was not being used, would not remove.
CHI-03-1	Eastern	50	26.5	6.25	5	basalt	—	2-sided, but she usually goes to the molino, so she doesn't use the *poch'oc* side very often. Still very thick.
CHI-04-1	Eastern	10	23.5	5.5	5.25	basalt	—	Very thick, used every day.
CHI-04-2	Eastern	15	25	5.75	5.5	basalt	—	Not used very much. Was found sitting under a table with the metate (#2).
CHI-05-1	Eastern	50-60	27.75	6.75	4.5	basalt	—	2-sided- Does all three grinds on the metate in the morning and will grind the rest of the day's "*poch'oc*" step at the molino.
CHI-05-2	Eastern	50-60	—	—	—	basalt	—	This one is up in storage (probably above the rafters of the roof). They didn't want to get it down or go into their kitchen to see the other one.
CHI-06-1	Eastern	?	26.25	6.5	4	basalt	—	2 sided; *poch'oc* side is noticeably rougher than other side (*litz'oc*).

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)	Day's labor (Q=quetzales)
CHI-01-1	This was her grandmother's metate with an estimated date of 100-150 years old. (She also bought one for her son 18 yrs ago for Q20 and a day's labor was .50 per day at that time.)	45	given	grandmother	—	—
CHI-02-1	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-02-2	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-02-3	Given to her mother by their grandmother.	—	given	grandmother	—	—
CHI-03-1	This metate was bought and used by her mother a long time ago. Mixed answers about where her mother got the metate. She now said that it may be 100 yrs old.	50	given	mother	25 WM	.25 per day
CHI-04-1	This one was bought 10 years ago in Carcha.	10	bought	Carcha market	60 WM	—
CHI-04-2	Given to her by her father when she got married 15 years ago. She only used it for about a year, she thinks.	15	given	father	—	—
CHI-05-1	Grandfather bought it years ago in Carcha.	50-60	bought	Carcha market	8 WM	.10 per day
CHI-05-2	Grandfather, who lives with them, bought it in Carcha many years ago.	50-60	bought	Carcha market	8 WM	.10 per day
CHI-06-1	This was given to her by her mother. She doesn't know how old it is.	24	given	mother	—	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-07-1	Eastern	6	23.25	5.25	4.5	basalt	—	2-sided, not evident because both sides look about the same and it is still very squared off.
CHI-08-1	Eastern	?	23.5	5.5	5	basalt	—	Still thick with sharp edges. 2-sided, but almost always grinds the first grind at the molino or on the hand-grinder.
CHI-09-1	Eastern	*najter*/old	—	—	—	basalt	—	They would not allow us to see this mano.
CHI-09-2	Eastern	6	23.75	5.5	5	basalt	—	Large vesicles all over (1 cm in diameter). Dark basalt, still quite square, edges worn into a rounded shape. Only used for coffee grinding all its life.
CHI-09-3	Eastern	2	—	—	—	basalt	—	They would not allow us to see this mano.
CHI-10-1	Eastern	?	23.5	5.5	5	basalt	—	Dark basalt, tapered slightly, 2-sided but no visible evidence of which grinding suface is which.
CHI-10-2	Eastern	?	—	—	—	basalt	—	Would not let us see this one.
CHI-10-3	Eastern	—	—	—	—	basalt	—	Would not let us see this one.
CHI-11-1	Eastern	3	24.5	5.25	5	basalt	—	Still very new and thick, dark basalt, 2-sided, but she does her first grind at molino or with hand-grinder.
CHI-12-1	Eastern	2 genera-tions	23.75	6.25	4.25	basalt	—	Used for corn, 2-sided, although she says now they don't use it for the rough grind anymore, just for the final grind. Both grinding surfaces are very smooth and have rounded edges.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-07-1	They bought it 6 yrs ago in Carcha when they built their own house and moved out of his parent's house.	6	bought	Carcha market	95 WM	Q15 6yrs ago
CHI-08-1	It was bought by her in-laws (Amalia and Pablo Che) for the purpose of giving it to one of their children when they left the home. Sebastiana and Ismael got it from his parents 11 yrs ago when they were married and moved out from his parent's house.	11	given	mother-in-law	—	—
CHI-09-1	Given to her by parents when she got married.	—	given	her parents	—	—
CHI-09-2	This one was bought for one of her children for when they move out of the house.	6	bought	Chicojll	100 WM	—
CHI-09-3	She bought it 2 yrs ago for when one of her children gets married and moves out of the house.	2	bought	Chicojll	125 WM	—
CHI-10-1	Given to her by father long ago. Doesn't know how old it is.	?	given	father	—	—
CHI-10-2	Given to her when her mother died.	—	given	mother	—	—
CHI-10-3	She bought this one in Carcha, but doesn't know when.	—	bought	Carcha market	—	—
CHI-11-1	She bought this one 3 yrs ago when she had sold her other one. A couple of people have said that they have sold theirs, but they always buy another.	3	bought	Carcha market	100 WM	—
CHI-12-1	Given to her by grandmother 10 yrs ago.	10	given	grandmother	—	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-12-2	Eastern	1 generation	24.5	5.75	4.75	basalt	—	Used for chile, mano still quite thick with some green residue on it (maybe mold?).
CHI-12-3	Eastern	7	25	6.5	4.25	basalt	—	Used for coffee grinding. Mano seems to have been used a lot due to the width/height ratio. Deep trough of metate # 3 has tapered this mano during use.
CHI-13-1	Eastern	40	24	5.75	4.5	basalt	—	Grinding side is very smooth, newer, smooth edges.
CHI-14-1	Eastern	?	27	6	4.25	basalt	—	Very long mano, but height leads me to believe this is an old metate. 2-sided, but not for corn. Only uses top grinding surface for garlic, tomato and onion. Smooth bottom grinding surface which is used for corn (final grind only).
CHI-15-1	Eastern	?	23.5	5.75	5.5	basalt	—	2-sided, but she does all the rough grind on the hand-grinder or at the molino. Still thick, *litz'oc* side is quite smooth and *poch'oc* side had some unidentifiable chunky residue. Actually, it is corn that was just grond for the chickens.
CHI-16-1	Eastern	20	27	7	4	basalt	—	Very tapered ends, smooth grinding surface, thin, too. Dark basalt, 2-sided, but they say they only do a rough grind at the molino now.
CHI-16-2	Eastern	15	—	—	—	basalt	—	Did not measure or see it because it was in storage.
CHI-17-1	Eastern	—	—	—	—	basalt	—	Used for grinding corn. Would not let us see it.
CHI-17-2	Eastern	—	—	—	—	basalt	—	Used for grinding coffee and beans. I guess this one was not given to us to measure.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-12-2	Her mother bought this one a long time ago and used it for grinding coffee.	—	bought	?	—	—
CHI-12-3	Bought it 7 yrs ago in Tanchi and used it for chile.	7	bought	Tanchi	—	—
CHI-13-1	She bought it in Carcha 45 years ago for Q40.	40	bought	Carcha market	40 WM	Q5 per day
CHI-14-1	She bought it from the family of an old neighbor who had died. She got it 2 yrs ago, but it is a lot older than that.	2	bought	neighbor in Chicojl	100 WM	15 per day
CHI-15-1	Her mother bought it a long time ago in Carcha, so she doesn't know how old it is. Her mother gave it to her 5 yrs ago.	5	given	mother	75 WM	15 per day (5 yrs ago)
CHI-16-1	They bought this one 20 years ago in Carcha for Q6.	20	bought	Carcha market	6	Q1 per day
CHI-16-2	Bought this one in Carcha 15 years ago.	15	bought	Carcha market	8	Q1 per day
CHI-17-1	Bought from a neighbor for Q50.	—	bought	neighbor in Chicojl	50 WM	—
CHI-17-2	Bought this one from a neighbor for Q50.	—	bought	neighbor in Chicojl	50 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-17-3	Eastern	5	—	—	—	basalt	—	Not being used. Would not let us see it.
CHI-18-1	Eastern	17	24	5.75	5.25	basalt	—	Still quite new and has well-defined edges. Still pretty thick.
CHI-18-2	Eastern	2	—	—	—	basalt	—	This one was in the kitchen and she wouldn't let us see it. Preferred for us only to look at the one in the room (metate # 1). It is used all the time for grinding masa and making tortillas.
CHI-19-1	Eastern	?	24.5	5.5	5.25	basalt	—	This is a new mano. It replaced the one that broke. 2 sided, but only really use *litz'oc* side.
CHI-19-2	Eastern	20	22	6.25	4.75	basalt	—	Used more than other, but doesn't fit basin, too small.
CHI-19-3	Eastern	20	—	—	—	basalt	—	In storage, not used and we didn't see them.
CHI-19-4	Eastern	20	—	—	—	basalt	—	In storage, not used and we didn't see them.
CHI-20-1	Eastern	7	23	5	5	basalt	—	Not very rounded, still new, square edges.
CHI-21-1	Eastern	?	23.5	5.75	5.75	basalt	—	Not used anymore. Never used very much. Sitting up against wall. Still very thick with square egdes. Very new or unused.
CHI-21-2	Eastern	8	23.75	5.25	5.25	basalt	—	Although she uses this one often, it is still quite new, showing sharp, square edges. This is also evident in the height:width ratio.
CHI-22-1	Eastern	?	26	6.25	5.25	basalt	—	Both grinding surfaces are very smooth, dark basalt.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-17-3	Bought in Carcha 5 yrs ago.	5	bought	Carcha market	100 WM	—
CHI-18-1	This one was given to her by her father who bought it for her 17 years ago and gave it to her 15 years ago.	15	given	father	—	—
CHI-18-2	Bought this one 2 yrs ago from a neighbor.	2	bought	neighbor in Chicojl	100 WM	—
CHI-19-1	Bought after the other one broke. Don't know age, but it looks very new (see height:width ratio).	—	bought	—	—	—
CHI-19-2	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	20 WM	—
CHI-19-3	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	20 WM	—
CHI-19-4	Bought 20 years ago in Carcha for Q20.	20	bought	Carcha market	20 WM	—
CHI-20-1	Bought by her father for her 7 yrs ago in Carcha. This is supposedly the same metate as CHI-16-2, but they said that one was 15 yrs old and this one is only 7 yrs old.	7	given	father	100 WM	—
CHI-21-1	Given to her and husband by her father-in-law 2 yrs ago.	2	given	father-in-law	—	—
CHI-21-2	They bought this one 2 yrs ago from her father (Ricardo Ba) for Q100. Her father bought it 8 years ago.	2	given	father	—	—
CHI-22-1	Given to her by her mother 10 yrs ago.	10	given	mother	100 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-23-1	Eastern	—	26.75	6.5	4.75	basalt	—	Both grinding surfaces are very smooth, mano is tapered and still thick. Dark basalt.
CHI-24-1	Eastern	?	23.75	6	5.25	basalt	—	Still thick, 2-sided and used as 2-sided everyday almost. It is also slightly tapered.
CHI-25-1	Eastern	?	25.25	5.75	4.75	basalt	—	Tapered, 2-sided and used as a 2-sided often.
CHI-26-1	Eastern	?	25.5	6	4.75	basalt	—	Used for grinding corn, still thick, 2-sided, but not really used much for rough grinding, slightly tapered.
CHI-26-2	Eastern	?	26	6.5	4.5	basalt	—	Used for grinding coffee. Large in length, covered in coffee residue.
CHI-27-1	Eastern	?	—	—	—	basalt	—	Would not allow us to see it or enter the kitchen.
CHI-28-1	Eastern	30	24	6	4.75	basalt	—	2-sided, but does not grind the rough grind on the metate (usually does the intitial grind at molino or on hand-grinder). *Litz'oc* side is very smooth.
CHI-29-1	Eastern	3 months	23.5	5.75	5.75	basalt	—	Same height as width which indicates that it is still new, as she has told us. Still shows the sharp-cut edges of a newer metate. Very slightly tapered, 2-sided and even though both grinding surfaces are used a lot, it is not visible which one is which.
CHI-30-1	Eastern	12	24	5.25	4.75	basalt	—	Ends of the mano are stylistically cut into a tapered shape. She said she bought it like that. 2-sided, but says she only uses the *litz'oc* side.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-23-1	Given to her 12 yrs ago by her parents.	12	given	parents	—	—
CHI-24-1	Given to her by her father 3 yrs ago for when she got married. Her father bought it a long time ago before she was married, but she doesn't know when.	3	given	father	—	—
CHI-25-1	It belonged to her father 50 years ago, and when he died, she inherited it.	50	given	father	—	—
CHI-26-1	Given to her by her parents 40 yrs ago.	40	given	parents	—	—
CHI-26-2	Given to her by her parents 40 yrs ago. Doesn't know exact age.	40	given	parents	—	—
CHI-27-1	Given to her mother by her grandfather (her mother's father).	2	given	grandfather	—	—
CHI-28-1	Bought 30 yrs ago in Carcha for Q9.	30	bought	Carcha market	9 WM	—
CHI-29-1	She and her husband bought it 3 months ago when she moved out of her parents house and moved with her husband up the hill to their own house.	3 months	bought	Carcha market	120 WM	Q20 per day
CHI-30-1	Bought it 12 yrs ago when she moved out of her parent's house.	12	bought	Carcha market	75 WM	Q10-15 per day

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-31-1	Eastern	?	23.5	5.5	4.75	basalt	—	2 sided- used often as a 2-sided mano. Both grinding surfaces are very smooth, althought the *poch'oc* side is pitted more (vesicles more visible) than the *litz'oc* side.
CHI-32-1	Eastern	?	29.5	6.5	5.75	basalt	—	Only one side used to grind. They always go to the molino. The metate is very long and wide (see measurements).
CHI-33-1	Eastern	*najter*/old	—	—	—	basalt	—	Would not let us see kitchen or mano.
CHI-33-2	Eastern	8	23.75	5.5	5.25	basalt	—	Dark basalt, still quite large/thick, only used to grind coffee.
CHI-34-1	Eastern	155	30.25	7	5.25	basalt	—	It is huge, dark from grinding coffee. See width-height ratio.
CHI-34-2	Eastern	25	24	5.5	5	basalt	—	Still somewhat thick, but edges are rounded significantly. It has been used over many years.
CHI-34-3	Eastern	1	23	5.75	5.5	basalt	—	Very new, thick and still shows squared edges (indicating recent production and little use).
CHI-35-1	Eastern	100+	—	—	—	basalt	—	In storage, so I didn't get to measure it, although I could see it from afar.
CHI-35-2	Eastern	45	—	—	—	basalt	—	Classic Eastern style mano. Slightly tapered, only ground on one side.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-31-1	Her father bought it for them. He gave it to them 20 years ago.	20	given	father of wife	—	—
CHI-32-1	Given to them 30 years ago by her mother-in-law. She doesn't know when her in-laws bought it, but knows it is pretty old.	30	given	mother-in-law	—	—
CHI-33-1	Her father gave this one to them 40 yrs ago. It is a "*najter ka'*," but she does not know how old.	40	given	father	—	—
CHI-33-2	They bought this one from a neighbor lady 8 yrs ago and it is used for coffee.	8	bought	neighbor in Chicojll	200 WM	—
CHI-34-1	They traced this one back to his great-great grandmother (the grandmother of his mom who still lives with them) who walked to San Luis Jilotepeque to buy it. He estimated it to be about 155 years old.	?	given	grandmother	—	—
CHI-34-2	His father bought this one about 30 years ago.	25	given	father	—	—
CHI-34-3	Bought in Carcha 1 year ago.	1	bought	Carcha market	—	—
CHI-35-1	Given to him from father 40 yrs ago. Thinks that it is more than 100 yrs old.	40	given	father	—	—
CHI-35-2	Bought in Carcha 45 yrs ago.	45	bought	Carcha market	11 WM	.40 a day

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
CHI-36-1	Eastern	100+	24	6.5	4	basalt	—	Very thin, basalt, extremely tapered.
CHI-36-2	Eastern	34	23.5	5.75	4.75	basalt	—	Edges still squared. Dark basalt, looks like they used it to grind coffee.
IXT-01-1	Western	75+	47	7.25	—	basalt	*rax abaj*	Very worn on each end where it has been held. Evenly worn all the way around the grinding surface.
IXT-01-2	Western	18	—	—	—	basalt	*rax abaj*	Ends of mano are not as worn. Has residue of chile on mano.
IXT-02-1	Western	5	47	7.5	—	basalt	*rax abaj*	Some wear on ends of *brazo*, otherwise, evenly tapered. Grinding surface is quite rough.
IXT-02-2	Western	3	44	7	—	basalt	*rax abaj*	Tapered *brazo*, not very smooth (see profile), lighter in color than metate.
IXT-02-3	Western	1	34.5	6.5	—	basalt	*rax abaj*	Even more slightly tapered than metate # 1. Covered in achiote residue.
IXT-03-1	Western	?	40	7	—	basalt	*rax abaj*	The biggest and oldest of the 4. Some wear at the ends where hands hold the mano. Evenly worn around grinding surface.
IXT-03-2	Western	10-15	42	7	—	basalt	*rax abaj*	She used this one to show me how to grind from nixtamal to masa. Dark basalt. Rough and slightly tapered.
IXT-03-3	Western	5	35.5	7	—	basalt	*rax abaj*	The shape of this one looks more like she only uses one side of the mano to grind with because one side is flatter rather than the whole mano being evenly worn all the way around. Covered in achiote residue.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
CHI-36-1	Given to her by her father. Approximately 100-150 yrs old.	—	given	father	—	—
CHI-36-2	Bought 34 years ago.	34	bought	—	50 WM	.50 per day 34 yrs ago
IXT-01-1	Given to her by mother 75 yrs ago.	75	given	mother	—	—
IXT-01-2	Bought 18 yrs ago in Nahualá.	18	bought	Nahualá market	125 WM	Q15-20 per day
IXT-02-1	Bought 5 yrs ago in Nahualá.	5	bought	Nahualá market	80 WM	—
IXT-02-2	Bought 3 yrs ago in Nahualá.	3	bought	Nahualá market	75 WM	—
IXT-02-3	Bought 1 year ago in Nahualá market.	1	bought	Nahualá market	40 WM	—
IXT-03-1	Given to her 25 years ago by her mother. She doesn't know its actual age.	25	given	mother	—	—
IXT-03-2	Bought 10-15 yrs ago in Nahualá. Used just for grinding corn.	10-15	bought	Nahualá market	60 WM	—
IXT-03-3	Bought 5 yrs ago. Used for chile, achiote, and tomato grinding.	5	bought	Nahualá market	45 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
IXT-03-4	Western	8-10	40.5	6.5	—	basalt	*rax abaj*	Covered in coffee residue. Not used much.
IXT-04-1	Western	?	41.2	7	—	basalt	—	Very worn where hands hold each end. Very smooth all the way around (evenly worn).
IXT-05-1	Western	?	46	7.25	—	basalt	—	Worn on ends where hands grip the mano, heavy patination, has two grinding surfaces that are flatter than the rest.
IXT-05-2	Western	18	—	—	—	basalt	—	They wouldn't take this one out. It is used for *recado*.
IXT-06-1	Western	12	39.5	6.5	—	basalt	*rax abaj*	Very round and worn evenly all the way around grinding surface. Highly patinated, not very worn at ends of mano.
IXT-06-2	Western	15	—	—	—	basalt	—	Would not let us see or measure it. They say it is used for *recado*.
IXT-06-3	Western	2	—	—	—	basalt	—	Would not let us see or measure it. They say it is used for grinding corn.
IXT-07-1	Western	?	40.5	6	—	basalt	*rax abaj*	No wear where hands grip mano, gradually tapered, very smooth.
IXT-07-2	Western	?	—	—	—	basalt	—	Would not let us see or measure it. They say it is used for grinding corn.
IXT-08-1	Western	2	46.5	7.25	—	basalt	—	New, not very smooth, slightly tapered, no hand wear on ends of mano.
IXT-08-2	Western	1	—	—	—	basalt	—	Used for *recado*. Wouldn't let us see it.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
IXT-03-4	Bought 8-10 yrs ago for Q40 in Nahualá.	8-10	bought	Nahualá market	40 WM	—
IXT-04-1	Given to her 10 yrs ago by her grandparents.	10	given	grandparents	—	—
IXT-05-1	Given to them 17 yrs ago by grandparents.	17	given	grandparents	—	—
IXT-05-2	Bought 18 yrs ago in Ixtahuacán.	18	bought	Ixtahuacán market	25 WM	—
IXT-06-1	Bought 12 yrs ago in Raxquim.	12	bought	Raxquim	10 WM	—
IXT-06-2	Bought 15 yrs ago in Raxquim.	15	bought	Raxquim	10 WM	—
IXT-06-3	Bought 2 yrs ago in Raxquim.	2	bought	Raxquim	5 WM	—
IXT-07-1	It was given to them by grandparents. This lady is about 80 years old, so I estimate this metate to be about 150 yrs old.	60	given	grandparents	—	—
IXT-07-2	Didn't tell me age. They were real reluctant to give information. I think they wanted to say that both metates and manos were given to them from their grandparents, but they weren't really clear. No certain age.	—	—	—	—	—
IXT-08-1	Bought in Nahualá 2 yrs ago.	2	bought	Nahualá market	150 WM	—
IXT-08-2	Bought in Nahualá 1 yr ago.	1	bought	Nahualá market	40 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
IXT-09-1	Western	18	—	—	—	basalt	*rax abaj*	Would not let me measure because of "measuring *awas*." Worn where hands grip mano, has some achiote residue.
IXT-09-2	Western	2 months	—	—	—	basalt	*rax abaj*	Would not let me measure because of "measuring *awas*." Used for *recado*.
IXT-09-3	Western	?	—	—	—	basalt	*rax abaj*	Would not let me measure because of "measuring *awas*." Smaller and used for coffee.
IXT-10-1	Western	?	—	—	—	basalt	*rax abaj*	Would not let me measure because of "measuring *awas*." Worn edges from where the hands grip the mano. Mano is heavily patinated.
IXT-10-2	Western	?	—	—	—	basalt	*rax abaj*	In storage and she would not let me measure because of "measuring *awas*." Used to grind coffee.
IXT-10-3	Western	?	—	—	—	basalt	*rax abaj*	In storage and would not let me measure because of "measuring *awas*." Used to make *recado*.
IXT-10-4	Western	6	—	—	—	basalt	*rax abaj*	Would not let me measure because of "measuring *awas*." This was bought second-hand. Used to grind corn when there is no room in kitchen.
IXT-11-1	Western	?	46	7.5	—	basalt	*rax abaj*	It appears to be very smooth and round (evenly worn). Overall, mano is tapered from end to end (lenticular) and curved slightly.
IXT-11-2	Western	?	—	—	—	basalt	—	It was in storage and we could not view it for measurements or description. Used for *recado*.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
IXT-09-1	Given to her by grandparents.	?	given	grandparents	—	—
IXT-09-2	Bought in Nahualá 2 months ago.	2 months	bought	Nahualá market	—	—
IXT-09-3	Given to them by granparents very recently. Don't know how old it is.	?	given	grandparents	—	—
IXT-10-1	She got it from her mother and it was always in her mother's home for as long as she could remember.	—	given	mother	—	—
IXT-10-2	Mother gave it to her.	—	given	mother	—	—
IXT-10-3	From her mother as well. She doesn't know the age or price on this one either.	—	given	mother	—	—
IXT-10-4	Bought in Nahualá as a second-hand mano.	6	bought	Nahualá market	60 WM	—
IXT-11-1	Given to her by her grandparents.	?	given	Grandparents	—	—
IXT-11-2	Given to her by her grandparents.	?	given	Grandparents	—	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
IXT-12-1	Western	6-7	43	7.5	—	basalt	*rax abaj*	The mano is somewhat tapered from end to end. It still has a rough texture and is covered in bean and chile residue.
IXT-13-1	Western	?	41.5	7.25	—	basalt	*rax abaj*	It is worn where hands hold the mano which makes it dog-bone in shape. It is also very smooth and worn evenly all the way around and highly patinated.
IXT-13-2	Western	3	27	4.75	—	basalt	*rax abaj*	It was covered in achiote residue, tapered from end to end (lenticular), and still looks new or hasn't been used much.
IXT-15-1	Western	?	44	6.75	—	basalt	*rax abaj*	Grinding surface is very smooth and shiny. Seems to be 2-sided, but not worn very evenly. Dog-bone shaped due to areas where hands have worn the stone.
IXT-15-2	Western	12	—	—	—	basalt	—	In storage and was not able to measure it. Used to make *recado*.
IXT-15-3	Western	12	—	—	—	basalt	—	In storage and was not able to measure it. Used to grind coffee.
IXT-16-1	Western	?	42	7	—	basalt	—	Flat on one side (presummed to be grinding surface.)
IXT-16-2	Western	?	—	—	—	basalt	—	Covered in achiote residue, very small.
IXT-16-3	Western	?	—	—	—	basalt	—	In storage and was not able to measure it. Used to grind coffee.
IXT-16-4	Western	?	—	—	—	basalt	—	This was only part of a mano and was being used to grind coffee and chile on a broken metate.
IXT-17-1	Western	1	29	5.5	—	basalt	—	Used for achiote.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
IXT-12-1	Bought 6-7 years ago in Nahualá	6-7	bought	Nahualá market	50 WM	—
IXT-13-1	Given to her by her mother about 10 years ago.	10	given	mother	75 WM	—
IXT-13-2	Bought 3 years ago in Nahualá.	3	bought	Nahualá market	20 WM	—
IXT-15-1	Bought it from her mother about 50 yrs ago.	—	bought	mother	—	—
IXT-15-2	Bought in Nahualá 12 yrs ago for Q50.	12	bought	Nahualá market	50 WM	—
IXT-15-3	Bought in Nahualá 12 yrs ago for Q50.	12	bought	Nahualá market	50 WM	—
IXT-16-1	Bought for Q80.	—	bought	Nahualá	80 WM	—
IXT-16-2	Given to her by her grandmother who bought it a long time ago.	—	given	grandmother	—	—
IXT-16-3	His grandmother bought this one.	—	given	grandmother	—	—
IXT-16-4	Also bought by his grandmother.	—	given	grandmother	—	—
IXT-17-1	She bought it in Nahualá 1 yr ago for Q15.	1	bought	Nahualá	15 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
IXT-18-1	Western	?	43	7	—	basalt	—	This mano is very worn where hands grip the ends. It looks 2-sided. It is not worn evenly all the way around.
IXT-18-2	Western	?	—	—	—	basalt	—	Also covered in achiote. It seems that this mano was used for a bigger metate but it looks like one side broke off so they just reused it for the smaller metate.
IXT-19-1	Western	1	—	—	—	basalt	—	In storage.
IXT-19-2	Western	1	—	—	—	basalt	—	In storage.
IXT-19-3	Western	?	—	—	—	basalt	—	In storage.
IXT-19-4	Western	100+ (4 generations)	46.5	7.25	—	basalt	*rax abaj*	This is a very large mano. It does not have much wear where the hands grip it.
IXT-19-5	Western	1	—	—	—	basalt	—	In storage. Used for grinding achiote/*recado*.
IXT-20-1	Western	?	44	7	—	basalt	*rax abaj*	This is a new mano that they just bought. It is not the original. It is slightly tapered from end to end.
IXT-20-2	Western	—	—	—	—	basalt	—	In storage.
IXT-20-3	Western	2	—	—	—	basalt	—	In storage.
IXT-21-1	Western	4	42	7	—	basalt	—	Long and tapered evenly. Evenly worn all the way around. Not very smooth which is a sign a small amount of usage.
IXT-21-2	Western	?	—	—	—	basalt	—	In storage. Used for achiote/*recado*.
IXT-21-3	Western	8	—	—	—	basalt	—	In storage.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
IXT-18-1	She received it from her mother when she was 30 yrs old and when she left the house when she married. The mano and metate were originally given to her mother by her great-grandparents.	30	given	mother	—	—
IXT-18-2	This one was also given to her by her mother when she left the house 30 yrs ago with her husband.	30	given	mother	—	—
IXT-19-1	Bought in Nahualá about 1 year ago for Q100.	1	bought	Nahualá market	100 WM	—
IXT-19-2	Bought used from a neighbor in Ixtahuacán about 1 yr ago for Q175.	1	bought	neighbor (Ixtahuacán)	175 WM	—
IXT-19-3	Brought to Antigua Ixtahuacán by her mother long ago. (She is about 85 yrs old herself.)	—	given	mother	—	—
IXT-19-4	Brought to Antigua Ixtahuacán by her mother long ago. (She is about 85 yrs old herself.)	?	given	mother	—	—
IXT-19-5	Bought in Nahualá about 1 year ago for Q30.	1	bought	Nahualá market	30 WM	—
IXT-20-1	Recently bought to replace old one.	—	bought	Nahualá market	—	—
IXT-20-2	Given to her by her mother 10 yrs ago.	10	given	mother	—	—
IXT-20-3	Bought 2 yrs ago in Nahualá for Q75.	2	bought	Nahualá market	75 WM	—
IXT-21-1	4 yrs ago, her mother-in-law bought it for them for Q75.	4	given	Mother-in-law	75 WM	—
IXT-21-2	Bought 5 yrs ago for Q20 in Antigua Ixtahuacán.	5	bought	neighbor	20 WM	—
IXT-21-3	Bought 8 yrs ago in Nahualá for Q150.	8	bought	Nahualá market	150 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
IXT-21-4	Western	8	—	—	—	basalt	—	In storage.
IXT-22-1	Western	?	—	—	—	basalt	—	In storage.
IXT-22-2	Western	15 days old	39	6	—	basalt	—	Brand new, has some corn residue. Slightly tapered from end to end. Still very rough due to little use.
IXT-23-1	Western	?	28	5.5	—	basalt	—	Covered in achiote/*recado* residue. Slightly tapered from end to end.
IXT-23-2	Western	?	—	—	—	basalt	—	Used to grind corn.
IXT-23-3	Western	?	—	—	—	basalt	—	In storage. Used for coffee.
IXT-24-1	Western	?	44	6.5	—	basalt	—	Appears to be 2-sided, not evenly worn. Very worn where hands grip mano and very smooth on grinding surfaces.
PAN-01-1	Eastern	90	25	6	—	basalt	—	Smooth on bottom (grinding side), shiny where hands grip the top of mano.
PAN-02-1	Eastern	67	24.5	6	4.5	basalt	—	Rough top, smooth bottom (grinding surface), one end smaller than the other.
PAN-03-1	Eastern	11	24.5	5.5	5	basalt	pec	Not very smooth on bottom; fits trough like others, remnants of achiote. She told me that you can use the mano either way; there is no preferred proximal or distal end. She said she repecked last November.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
IXT-21-4	Bought 8 yrs ago in Nahualá for Q150.	8	bought	Nahualá market	150 WM	—
IXT-22-1	Given to her by her mother 5 months ago when she and her family moved to this house.	5 months	given	mother	—	—
IXT-22-2	Bought 15 days ago in Nahualá for Q75.	15 days ago	bought	Nahualá market	75 WM	—
IXT-23-1	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-23-2	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-23-3	Given to her when she was 16 yrs old by her mother.	16	given	mother	—	—
IXT-24-1	Given to her by her father. She thinks the metate might be as old as her great-grandmother.	—	given	father	—	—
PAN-01-1	Given to her by her mother-in-law who received it from her mother. (3 generations).	35	given	mother-in-law	—	Q15 (35 yrs ago)
PAN-02-1	Given to them by mother who received it from her father when she left their home with her husband. Alejandro Ca'al (interviewee's grandfather) bought it 67 years ago for his house when he was 7 years old for Q3.	26	given	mother	3 WM	.5 (67 yrs ago)
PAN-03-1	Bought 11 years ago in Tucuru, Alta Verapaz from Cahua Chino, the only person that sells them in Tucuru.	11	bought	Cahua Chino/ Tucuru	110 WM	Q7.5 (11 years ago)

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-04-1	Eastern	90	23.5	6	5	basalt	—	Looks like all sides have been used; she says only the bottom has been used.
PAN-05-1	Eastern	10	27.5	6.25	5.25	basalt	—	A 2-3 cm section of grinding surface is highly patinated. No proximal or distal sides; used interchangeably.
PAN-06-1	Eastern	25-30	24.5	5.5	4.5	basalt	—	The mano is slimmer in height than others seen. Heavy patination on top (where hands grip mano). Smooth on grinding surface due to infrequent repecking. Rosa says she uses both sides to grind.
PAN-07-1	Eastern	10	22.5	6	5.5	basalt	—	Looks like both top and bottom of mano have been used because both sides are patinated. She showed how it is always used (only one side and one direction).
PAN-08-1	Eastern	—	23.5	5.5	4.5	basalt	—	Both sides used. Looks like an older stone. Tapered on each end as style suggests.
PAN-09-1	Eastern	3	25	6.25	5.5	basalt	—	Both grinding surfaces (top and bottom) look as new as she says. Mano is still relatively thick.
PAN-10-1	Eastern	—	24.5	6	4	basalt	—	The mano is very thin compared to others. Tapered and heavily patinated on top and bottom. She says she used both sides to grind.
PAN-10-2	Eastern	—	24.5	4.75	4.5	basalt	—	Excluding masa residue, this rock is very dark and there is not much patination. It is not very tapered.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-04-1	Received it 5 yrs ago from father and mother (Josefina Chup). She didn't have enough money to buy one so her father had bought 3 a long time ago and gave one to the kids (boys). She says they are usually only for the boys.	5	given	Father	—	—
PAN-05-1	They bought it 10 years ago when they left their family's house. (Alejandro Ca'al's home)	10	bought	Teleman market	160 WM	Q5 a day (10 yrs ago)
PAN-06-1	Bought 25-30 yrs ago after their home burned down. The one that burned was bought by Rosa when she was 20 yrs old before she was married.	25	bought	Tucuru	3 WM	.25 a day (25 yrs ago)
PAN-07-1	Jose Alberto Pop- Marta's husband- bought it when he was young in the Tucuru market. His mother died and his father deserted them and so he moved in with his brother and sister-in-law. That is when he bought the metate. It was before he married Marta.	10	bought	Tucuru	50 WM	—
PAN-08-1	His father bought it many years ago and gave it to him (Alejandro-interviewee) when he left the house to live with his girlfriend (not married).	15	given	Father	50 WM	—
PAN-09-1	She bought it 1-3 years ago in Tucuru from Don Chino.	3	bought	Tucuru- Don Chino	75 WM	—
PAN-10-1	Given to her by father 8 years ago. Not sure of age or how much it cost.	8	given	father	—	—
PAN-10-2	Her father had bought this one "*najter/junxil*" (anciently/a long time ago).	8	given	father	—	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-11-1	Eastern	10	23.5	5.5	4.5	basalt	—	She said that the first side is for "*poch'oc*" (breaking up kernals) and the other side is for "*k'unic*" (making it smooth).
PAN-12-1	Eastern	30	23	5.5	4	basalt	—	Tapered and formed well to the basin. Opposite ends are ground thin.
PAN-13-1	Eastern	6	22.5	6	4.75	basalt	—	The girl (Jose's daughter) said they only use the ventral side and it is well worn with a few larger vesicles showing.
PAN-13-2	Eastern	8	23.5	6	4.75	basalt	—	Only one side used and is well worn. He said that they resurfaced/repecked it 6 months ago.
PAN-14-1	Eastern	15	24.5	5.75	3.5	basalt	—	This mano is thinner than the other one (mano #2). The rock might have been softer. They quit using this mano and metate 2 years ago. That means it got 13 years of use. Extremely tapered almost to a point.
PAN-14-2	Eastern	20	24.75	6	3.75	basalt	—	This mano & metate had only 5 yrs of use before the side broke off. The mano is still thick and now has 7 yrs of use. One side is for "*poch'oc*" (rough grind) and is more pitted and rougher. The other side is for the "*litz'oc*" (fine grind) and is smoother.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-11-1	Bought it in Coban market 10 years ago.	10	bought	Coban market	100 WM	15
PAN-12-1	Bought by her parents 30 years ago for themselves and gave it to her daughter 18 years ago.	18	given	mother	3 WM	—
PAN-13-1	This one was bought for his daughter 6 years ago and now that she is married, when she moves, she can take it with her. It was bought in the Tucuru market.	6	bought	Tucuru market	125 WM	10
PAN-13-2	He bought it 8 years ago in Tucuru market when his mother took back the one she let him borrow.	8	bought	Tucuru market	125 WM	10
PAN-14-1	Bought it in Tucuru 15 years ago.	15	bought	Tucuru market	115 WM	.50 day/ 20 yrs ago
PAN-14-2	He bought this one first 20 yrs ago, but five years in, the side of it busted off, so he bought metate #1. Then the holes appeared on metate #1 and he went back to this one and uses it now.	20	bought	Tucuru market	120 WM	.50 day/ 20 yrs ago

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-15-1	Eastern	35	23.5	6	4	basalt	—	One side is for "*poch'oc*" and the other is for "*litz'oc*." Obvious with one side more pitted than the other. *Poch'oc* has left over "*xbonil*" - achiote- in it when ground for *caldo*/soup. She told me that they only use the *poch'oc* side.
PAN-16-1	Eastern	44	23.5	5.5	4.5	basalt	—	Rough side of mano is for the first grind (*poch'oc*) and the smooth side is for the second and third grinds (*hesoc* and *litz'oc*). Lots of corn residue.
PAN-17-1	Eastern	10	23.5	5.5	4.5	basalt	—	2 sided mano - *poch'oc* (rough grind) and *hesoc*/*litz'oc* (fine grinds).
PAN-18-1	Eastern	16	23.5	5.75	3.75	basalt	—	2 sided- *pochleb* and *litzeb*; Thin and tapered on ends. Larger holes/vesicles on one side (*poch'oc*- rough grind).
PAN-19-1	Eastern	5	24	5.5	5	basalt	—	Still quite thick; gray basalt, slightly tapered. 2-sided, but not visible by texture. Both sides seem to be just as pecked/smooth as the other. May be because it is still new.
PAN-20-1	Eastern	50	23.5	6	3.5	basalt	—	2 sided, thin and extremely tapered.
PAN-20-2	Eastern	20	23.5	5.5	5.25	basalt	—	Looks barely used, dark in color because there is no corn/masa residue on it. Measurements show (height of mano) that it hasn't been used much over the last 20 years even though she says she uses both sides as well. Maybe uses mano #1 on this stone.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-15-1	This one was bought after their house burned down. The one before this one was 40 yrs old, but they didn't salvage it.	35	bought	Tucuru market	20 WM	.25
PAN-16-1	He bought it when he was 13 yrs old when he "found" a woman. They married 35 years ago.	44	bought	Tucuru market	35 WM	.20
PAN-17-1	Bought it 10 years ago when he left his parents home.	10	bought	Tucuru market	120 WM	Q10 per day
PAN-18-1	Her mother-in-law gave her and husband one when they married, but they sold it and bought this one.	16	bought	Tucuru market	11 WM	—
PAN-19-1	Bought in Tucuru 5 yrs ago.	5	bought	Turucu market	130 WM	10 per day
PAN-20-1	They bought it 50 years ago in Tucuru.	50	bought	Tucuru market	11 WM	—
PAN-20-2	Bought it 20 years ago for when next child was to leave the house.	20	bought	Tucuru market	20 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-21-1	Eastern	10 months	25	5.75	5.5	basalt	—	Was just bought last year (2003). Has some pretty deep pits and my guide says it looks like it was made from bad stone. She said that the holes/pits appeared after the second time she used it.
PAN-21-2	Eastern	7	24.5	5.75	3.75	basalt	—	2-sided; *litz'oc* side is distinctly smoother than the other side. Quite thin.
PAN-22-1	Eastern	150?	23.5	6.75	3.25	basalt	—	Thin and tapered on opposite ends (to a point). Large vesicles and heavy patination on grinding surface.
PAN-23a-1	Eastern	—	24	6	3.75	basalt	—	2-sided - *litz'oc* side is super shiny. Opposite ends are slightly tapered. Profile looks almost octagonal. Dark basalt.
PAN-23b-1	Eastern	75-100	23.75	5.75	2.75	basalt	—	Very thin and tapered to a point on opposite ends.
PAN-24-1	Eastern	40	24	5.75	5	basalt	—	Pretty thick mano, not very tapered on opposite ends, couldn't see much because she was using it.
PAN-25-1	Eastern	—	21.5	7	3.5	sand-stone	—	First mano that isn't basalt. Brownish rock, no vesicles. Might have been a river cobble, but not familiar with the type of rock (maybe sandstone). This mano is a lot more rounded than others and not purchased with this metate. See Table 1, PAN-25 survey-Q.28.
PAN-26-1	Eastern	50	24	6	2.75	basalt	—	Very thin and smooth on both grinding surfaces.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-21-1	She just bought it last year (2003).	10 months	bought	Tucuru market	100 WM	—
PAN-21-2	Bought 7 yrs ago in Tucuru market.	7	bought	Tucuru market	120 WM	—
PAN-22-1	—	—	—	—	—	—
PAN-23a-1	Given to them 8 yrs ago by her husband's parents. She doesn't know how old it is.	8	given	in-laws (husband's parents)	—	—
PAN-23b-1	It was given to them by the wife's father who bought it 75-100 years ago.	10	given	father-in-law	8 WM	—
PAN-24-1	Bought it 40 years ago in Carcha.	40	bought	Carcha market	5 WM	.015 of a quetzal
PAN-25-1	Her husband bought it a while back, but she doesn't when or where. It was stolen at one time but she found it in the woods without the mano. They found this mano somewhere and are using it to grind.	—	bought	—	—	—
PAN-26-1	The father bought it 50 yrs ago.	50	bought	Tucuru market	25 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-26-2	Eastern	6	24.5	5.5	4.75	basalt	—	Not used as much as it seems.
PAN-27-1	Eastern	1	24.25	5.5	5	basalt	—	Still quite thick because it hasn't been used much.
PAN-27-2	Eastern	15	24.5	6	3.75	basalt	—	Same type of rock as metate #1. Broke about a year ago and it was laying in a hallway between kitchen and house in the dirt.
PAN-28-1	Eastern	20	24.5	5.25	4.75	basalt	—	Dark basalt and thick (see height).
PAN-29-1	Eastern	15	24	6.25	3	basalt	—	Very thin and smooth underside/grinding surface. 2-sided.
PAN-30-1	Eastern	50	23.5	6	3.25	basalt	—	Very thin; half the size of its width. 2-sided- "*litz'oc*" side is very smooth and shiny and "*poch'oc*" side is rougher.
PAN-31-1	Eastern	5	23.5	6.25	3	basalt	—	Very thin. Either this mano and metate are older than she thinks, or she really uses it a lot more than other people use theirs. 2-sided; *litz'oc* side is very smooth and shiny and *poch'oc* side is very rough.
PAN-32-1	Eastern	40	28.5	6.5	4.5	basalt	—	Big mano as well. 2-sided. Tapered like a cigar, dark basalt.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-26-2	Bought 6 yrs ago.	6	bought	Tucuru market	150 WM	—
PAN-27-1	This mano does not originally belong ot this metate. They bought it about a year ago when the other one broke.	1	bought	Tucuru	—	Q10 per day
PAN-27-2	Her mother/father bought them this metate 15 years ago when they moved out of her house.	15	given	mother/father	60 WM	—
PAN-28-1	Her mother gave her this metate 15 yrs ago.	15	given	mother (who bought it in Tucuru)	—	—
PAN-29-1	He bought it when he was 14 yrs old. When he was 17, he got married and already had it. He did this to prove his independence before he was married.	15	bought	Tucuru market	75 WM	Q1.50 per day
PAN-30-1	She got it from her mother when she left her parent's house with her husband. She actually switched with her mother's metate because she had bought one and it was too small.	11	given	mother	3 WM	—
PAN-31-1	Bought it in Tucuru market 5 years ago for Q100.	5	bought	Tucuru market	100 WM	—
PAN-32-1	At about 20 years old, her mother, who currently lives with her, bought it before she (the mother) had children. Her mother is now 60 years old, although she looks a lot older.	40	bought	Tucuru market	20 WM	—

*WM = Bought *with metate*

Table 5. Continued.

House/Mano Number	Type	Age (years old)	Length	Width	Height	Stone type (English)	Stone type (Native Lang)	Physical Description/Uses
PAN-33-1	Eastern	50	23	6	3	basalt	—	Thin, 2-sided; *litz'oc* side is obviously thinner.
PAN-34-1	Eastern	50	23	5.75	3.5	basalt	—	She said she doesn't like how small the mano is. She definitely has big hands for a Q'eqchi' woman and says that her fingers get ground from time to time. This is a 2-sided mano.
PAN-35-1	Eastern	40	23	6	5	basalt	—	Dark basalt, large, the mano is oblique (not extremely oblique, just slightly).
PAN-35-2	Eastern	30	23.5	6	3.75	basalt	—	Thinnest of the three in the house. Coffee is only ground with this mano. It is rarely used. The whole mano is brown from roasted coffee beans.
PAN-35-3	Eastern	4	23.5	5.5	5	basalt	—	This mano was sitting on a shelf with mano #2. See metate #3 for uses. Still very thick.
PAN-36-1	Eastern	7	23	6	4.25	basalt	—	2-sided. Both grinding surfaces look about the same and the mano is still thick. Dark basalt.

Table 5. Continued.

House/Mano Number	History	When acquired (years ago)	Bought/given	From whom acquired	Cost (Q=quetzales)*	Day's labor (Q=quetzales)
PAN-33-1	Bought 50 years ago in Tucuru market.	50	bought	Tucuru market	—	—
PAN-34-1	Bought in Tucuru market 50 years ago.	50	bought	Tucuru market	35 WM	—
PAN-35-1	Given to her only 6 months ago by her mother who is too sick to use it.	6	given	mother	3 WM	—
PAN-35-2	She bought this one 30 years ago.	30	bought	Tucuru market	20 WM	—
PAN-35-3	She bought this one about 4 years ago for when her son marries and moves out.	4	bought	Tucuru market	110 WM	—
PAN-36-1	She got it from her mother who bought it 7 years ago for her, most likely when she got married.	7	bought	Tucuru/given by mother	110 WM	—

*WM = Bought *with metate*

Table 6. Location of metate use and prohibited places of use.

House Number	Where used	Prohibited places of use
CHI-01	kitchen only	—
CHI-02	kitchen	—
CHI-03	kitchen	—
CHI-04	kitchen	—
CHI-05	kitchen	—
CHI-06	kitchen	—
CHI-07	kitchen	—
CHI-08	kitchen only	—
CHI-09	kitchen always	—
CHI-10	1 in kitchen, 1 in living room (for coffee), 1 in storage in bedroom area	—
CHI-11	Only used in the kitchen, but she stores it in the other part of her house for safekeeping.	—
CHI-12	all in kitchen	—
CHI-13	kitchen only	—
CHI-14	kitchen always	—
CHI-15	kitchen always	—
CHI-16	kitchen always	—
CHI-17	kitchen	—
CHI-18	# 1 used in kitchen and in living area (for coffee), and # 2 only in kitchen.	—
CHI-19	kitchen	—
CHI-20		—
CHI-21	kitchen always	—
CHI-22	kitchen always	You should not use or put the metate outside when the moon is out or the metate will break.
CHI-23	kitchen	—
CHI-24	kitchen always	—
CHI-25	kitchen	—
CHI-26	kitchen	—
CHI-27	kitchen always	—
CHI-28	kitchen always	Not to be used on the floor and should only stay on the wooden table for which it was prepared.
CHI-29	kitchen (her house is one room, so her bedroom is also her kitchen)	—
CHI-30	kitchen	—
CHI-31	kitchen	—

Table 6. Continued.

House Number	Where used	Prohibited places of use
CHI-32	kitchen always	It has to be in its place because if it isn't, it may fall and break.
CHI-33	kitchen	—
CHI-34	kitchen	—
CHI-35	kitchen	—
CHI-36	kitchen always	—
IXT-01	on the *aq'een* (in the house on the floor)	Can not use it outside because it is dirty there.
IXT-02	kitchen and living area	—
IXT-03	kitchen only	—
IXT-04	kitchen only	—
IXT-05	kitchen	kitchen always
IXT-06	kitchen	—
IXT-07	kitchen	—
IXT-08	kitchen, but stores it in the weaving room.	—
IXT-09	kitchen only	—
IXT-10	always in kitchen, although #4 is used in other parts of the house when there is no room in the kitchen.	—
IXT-11	in bedroom	—
IXT-12	only in the kitchen	—
IXT-13	only in kitchen	—
IXT-14	kitchen	—
IXT-15	kitchen	—
IXT-16	kitchen always	—
IXT-17		—
IXT-18	kitchen	—
IXT-19	kitchen	—
IXT-20	kitchen	—
IXT-21	kitchen only	—
IXT-22	kitchen	—
IXT-23	kitchen	—
IXT-24	kitchen	—
PAN-01	kitchen	If put outside, animals eat off of them and they can cause sickness.
PAN-02	kitchen	—
PAN-03	kitchen	Should not be used on the floor. It would get dirty.

Table 6. Continued.

House Number	Where used	Prohibited places of use
PAN-04	kitchen	—
PAN-05	kitchen	Should not be used on the floor. It would get dirty.
PAN-06	kitchen	Should not be used anywhere other than in kitchen. Kids might break the metate if it is somewhere else.
PAN-07	kitchen	It should only be on the wood table that it always sits on.
PAN-08	kitchen	—
PAN-09	kitchen	Should only be used on the table.
PAN-10	kitchen	Should not be used on the floor. It would get dirty and animals would get on it.
PAN-11	kitchen	Should not be used on the floor. It would get dirty.
PAN-12	kitchen	—
PAN-13	kitchen	—
PAN-14	kitchen	—
PAN-15	kitchen (table in kitchen)	Must stay on top of wooden bench
PAN-16	kitchen (house and kitchen were all one room)	Not to be used on the ground. It would be bad for wife's back to use it there.
PAN-17	kitchen	—
PAN-18	kitchen	Not on floor because animals will get on them.
PAN-19	kitchen	Only supposed to be on the table. It would get dirty anywhere else.
PAN-20	kitchen	—
PAN-21	kitchen only	—
PAN-22	kitchen always	Should always remain on the table
PAN-23a	kitchen always	—
PAN-23b	kitchen always	—
PAN-24	kitchen only	—
PAN-25	kitchen	—
PAN-26	kitchen	—
PAN-27	kitchen	Should stay in the place that is prepared for it.
PAN-28	kitchen	—

Table 6. Continued.

House Number	Where used	Prohibited places of use
PAN-29	kitchen	Do not use them on the floor. They will get garbage on them and that will contaminate the food.
PAN-30	kitchen only	—
PAN-31	kitchen	—
PAN-32	kitchen	Should only be used on the table designated for grinding.
PAN-33	kitchen	—
PAN-34	kitchen only	—
PAN-35	kitchen only	—
PAN-36	kitchen always	—

APPENDIX C
Notes on Grinding Times

Amalia Tiul Chub Che
Chicojl

Amount of maize: 12 oz.
Container size: diameter- 8 cm, depth- 8 cm

5:41- *Poch'oc*- put a small amount of nixtamal on metate and began to grind; also added water every once in a while.
5:43- Finished rough grind and mixed some water with dough; began to knead into ball.
5:44- *Hesoc*- she took the ball of masa and from the top of the metate pushed it down to the middle where she began to grind, bringing the mano closer to her torso every time she brought the mano back to grab more corn.
5:46- Finished *hesoc*. Placed comal on fire (she put a broken one on because she said the other was too big for what she was doing). Then she cleaned it with water and dried corn husk.
5:48- *Litz'oc*- she ground out enough dough for one tortilla, made a ball, and placed it at the end of the metate (made a little line of them). This is her way of doing it.
Time in seconds for each ball of dough ground out:
#1-? #2- 0:27 #3- 0:24 #4- 0:19 #5- 0:16 #6- 0:22
5:52- Finished *litz'oc* and began to clean the metate and mano with her thumb. She also began to *xoroc*- make tortillas and place them on the *kil*-comal. She wet her hands a little each time before working on the next tortilla.
#1-? #2- 0:37 #3- 0:45 #4- 0:45 #5- 0:37 #6- 0:36
5:58- All tortillas are cooking. She threw the little ball left over to the chickens and put the metate up against the wall (on the same table).
6:01- She finished cooking the tortillas. She made 6 with the amount she ground.

Alberto Che, Amalia's husband, said the normal proportion of tortillas for one person is 6 tortillas of this size (13-14 cm in diameter). For the bigger ones it is 4-5 tortillas per person (15-16 cm in diameter).

Note: When Amalia ground the corn for the *poch'oc*, she used the *poch'oc* side of the mano. She used the opposite side for the *hesoc* and *litz'oc*.

Sebastiana Chol Che
Chicojl

Amount of maize: 12 oz.
Container size: diameter- 8 cm, depth- 8 cm

5:19- *Poch'oc*- Continued to add a little water and reposition the kernels to the top of the metate. She is pushing hard. The whole table is bending inward.

5:22- Finished *poch'oc* and added water. Began kneading dough into a ball. Began *hesoc*. As she ground the dough a second time, she would pull masa that was not ground well from the sides of the metate and replace it back on the ball at the top of the metate, continually adding a little water (she started breathing hard here).

5:25- Finished *hesoc* and began preparing comal by placing it on the fire. She wet her hands and began the *litz'oc*. She ground out enough dough for one tortilla and lined it up at the end of the metate.
#1-? #2- 0:19 #3- 0:18 #4- 0:20 #5- 0:19 #6- 0:37
(She took a little longer to get all the dough off the metate for the last ball).

5:28- Finished *litz'oc*, started *xoroc*.
#1-38 #2- 0:40 #3- 0:33 #4- 0:47 #5- 0:53 #6- 0:58

5:34- Finished *xoroc*. All tortillas are cooking. She cleaned the metate with the back of her thumb and prepared a basket with a towel to put the tortillas in.

5:36- Finished cooking last tortilla. 6 were made.

- Sebastiana also used one side of her mano for the *poch'oc* and the other side for the *hesoc* and *litz'oc*.
- They said one person eats between 3-5 tortillas a meal.
- Usually for her family of four she makes 15 tortillas, and it is enough for one meal.

*Sebastiana is 29 years-old. She learned to grind when she was 10.

Manuela Tziquin Tambriz
Santa Catarina Ixtahucán

Amount of maize: 12 oz.
Container size: diameter- 8 cm, depth- 8 cm

11:27- Began the first grind. Continues to add water while grinding. Only added 1/3 cup of nixtmal at a time. Grinding motion is a rocking back and forth of "*brazo*" on basin surface.

11:31- Finished first grind and put it (ball of masa) at the top of metate. Began 2nd grind. Same motion, but it seems like only 1/3 of grinding surface is being used.

11:33- Began 3rd grind. Masa is becoming smoother and she continues to add a little water by dipping her hand into a container and dripping the water on the masa. She also repositions the corn as she is grinding about 10-15 cm down from the top of the metate by smashing it onto the surface.

11:35- Began 4th grind. Continued to add water. She ground out enough masa for one tortilla and dropped the ball on the board on which the distal end of the grinding stone is sitting. Times for each ball:
#1-? #2- ? #3- 0:28 #4- 0:25 #5- 0:23 #6- 0:20-:025?
#7 No time; this last one was made by rolling the remaining dough all over the mano and metate to get the last bit off. It was not ground the last time.

- She does not take all the masa she grinds for one tortilla and add it to the ball, but she takes the bit left and puts it back on the ball of masa that is at proximal end and regrinds it for the next ball.

11:40- Finished 4th grind and will begin to make tortillas. She was able to make about 7 tortillas with that amount of corn.

11:42- Began patting out tortillas.
#1-0:30 #2- ? #3- 0:15 #4- 0:21 #5- 0:22 #6- 0:21 #7- 0:22

11:45- Finished making tortillas and all are cooking on the stove. She continues to reposition them so they all cook evenly. "If we don't move them around, they tend to burn."

11:48- Took all the tortillas off the stove and put them in a basket with a cloth over them.

- For atole (*q'or*), they only grind the corn once on the metate (from nixtamal). Also, I noticed that as she is grinding, her hands slowly rotate the mano. I asked why and they said if they don't turn it, it will get too "*tzra tzic*"-

squared. So they slowly rotate it (every other 3-5 grinds down and back).

- If a person is not sick, they usually eat 8-10 tortillas each meal. Average size of their tortillas are 10-11 cm in diameter.

Four names of grinds:

#1- *cachaq'o*
#2- *catcio*
#3- *cacoqsaj*
#4- *cac'ato*
Pat out tortillas: *catcaro* or *calejo*

Ana Tzep Tzikin
Santa Catarina Ixtahucán

Amount of maize: 12 oz.
Container size: diameter- 8 cm, depth- 8 cm

min:sec
10:35- Started rough grinds.
10:44- Began fine grind without patting into balls. She ground out enough for three tortillas.
12:23- Put 3 balls into a bowl on *ac'qeen* simultaneously.
#1-0:33 #2- 0:33 #3- 0:33 #4- 0:16 #5- 0:16 #6- 0:16 #7- 0:42
12:38- Finished rest of masa (5th grind).
13:26- Put 3 more balls in the bowl simultaneously.
13:28- Finished grinding last of masa (6th grind) and rolled it around on metate to get what dough was left for last tortilla.
14:10- Placed metate and mano back up against the wall.

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Interim period- went to prepare fire/kiln.

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20:20- Began to pat out and cook tortillas.
#1-0:27 #2- 0:31 #3- 0:30 #4- 0:32 #5- 0:30 #6- 0:35 #7- 0:22
25:38- Finished cooking last tortilla.

Note: Ana explained to me that traditionally, there are only three grinds, but because women do not know how to grind well anymore, it takes five to six grinds to produce masa that is fine enough for making tortillas.

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