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CERAMICS AND THE SPANISH CONQUEST

*Response and Continuity of Indigenous
Pottery Technology in Central Mexico*

GILDA HERNÁNDEZ SÁNCHEZ

BRILL

Ceramics and the Spanish Conquest

The Early Americas: History and Culture

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Response and Continuity of Indigenous Pottery
Technology in Central Mexico

By

Gilda Hernández Sánchez



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*To my country,
which after everything continues looking with positive eyes
into the future*

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INTRODUCTION

The Spanish colonization dramatically interrupted the autonomous development of the ancient and diverse Mesoamerican civilization. Aztecs, Mixtecs, Mayas and numerous other indigenous peoples were abruptly transformed in “the colonized” a of foreign, distant and exploitative state. The colonial rule imposed a new language, new religion and new legal system, and all this had a profound impact on the native cultures. Nevertheless, the Mesoamerican world learnt to live with the conquest. The colonization was not only a time of crisis, but also a creative process in which indigenous peoples were looking for new ways to survive, and therefore they reacted and adapted in a variety of manners to the changing circumstances. Thus, the colonization resulted in a complex and enduring interaction between the indigenous and European worlds, and this gave way to new social systems, technologies and artistic expressions. In this process both worlds were active, and influenced each other over centuries till today.

The active role of Mesoamerican peoples in the creation of the colonial society has been evidenced in recent historical reconstructions of that period. For example, we know that they appropriated Spanish-based writing for their own purposes (Hanks 2010; Lockhart 1991:2-22). They became willing participants in the new religious practice but interpreted and incorporated the catholic faith into their own culture in a way that obligated colonizers to interact with the new etic code (Burkhart 1989; Gruzinski 1993; Jansen and Pérez Jiménez 2009:477; Klor de Alva 1993). They constructed and decorated an impressive amount of churches, convents and other religious buildings, creating their own regional version of the European Renaissance (Edgerton 2001). They maintained pre-conquest forms of organization in colonial times, in particular the *altepetl* in central Mexico, in a way that they became basic units of the Spanish colonial administration (Lockhart 1992:14, 1999:98-119; Restall 1997:306-319). In few words, as James Lockhart (1992:434) convincely shows, the indigenous culture was as important as the Spanish culture in determining the form and development of colonial society.

Without neglecting the dramatic effects of the conquest, all these studies show that the colonial period cannot be characterized as a time

of decay, weakening and loss of the indigenous culture. Certainly many pre-conquest cultural traits were lost in the process of adjustment to the new situation. However many other elements were maintained as in ancient times while others were transformed, giving way to new cultural forms. Furthermore, the pre-conquest world not only survived during the colonial time but also after it. Since decades scholars have documented that five hundred years after the conquest ancient cultural elements are still identifiable in several aspects of life in present-day indigenous communities in Mexico and Guatemala (e.g., Ichon 1973; Jansen and Pérez Jiménez 2009; Lupo 2001; Reyes and Christensen 1976; Schultze-Jena 1933; Tedlock 1992). Nevertheless, pre-conquest elements are today intertwined with colonial and contemporary cultural developments. As I will try to show in this work, the present-day indigenous world can be seen as the result of complex processes of continuity and change, in which different dimensions of culture have had different developments and roles across time.

Our knowledge about the role of the indigenous culture during the colonial period, and its continuity/change, has been mainly based on the vast corpus of chronicles and other historical documents from that time. Spanish written texts have been fundamental sources in our understanding of that period (e.g., Farris 1984; Gibson 1964; Gruzinski 1989; 1993), while research based on indigenous documentation has provided a new, and much more inclusive and correct, perspective of the colonial life (e.g., Cline 1986; Lockhart 1992, 1993; Restall 1997; Restall *et al.* 2005; Schroeder 1989; Terraciano 2001). Although both Spanish and indigenous documents show a partial vision of the past, documents have been, and will continue to be, essential for the historical reconstruction of that time. The extant corpus of Mesoamerican documentation is so wide and varied that it offers important insights into different aspects of the colonial culture. In addition, written texts of indigenous intellectuals and scribes not only show the native perception of the conquest but also values, conflicts and strategies of, at least, part of the colonial native society.

In contrast, material culture has been relatively little considered to elucidate that time, even though it might offer a more representative perspective of the history. Things, buildings, and material remains in general, provide a wider panorama in different aspects of ancient societies, including those details of the daily life that are obviated in documents. Also material culture offers a new prisma to see the active place

of the indigenous culture in the creation of the colonial society. Artefacts permit to explore how different participants in the new society acted; that is, what they produced, used or decide to not produce or use; how they behaved in domestic contexts and other private spheres seldom mentioned in documents, and at what extent they incorporated or reelaborated intrusive artistic styles (e.g., Gasco 2005a; Jordan and Schrire 2002; Lightfoot *et al.* 1998; van Dommelen 2005). In addition, artifacts have a chronological dimension that permits to document continuity or change during long spans of time.

With this in mind, my aim in this work is to suggest other perspectives to understand the role of the indigenous world in the formation of colonial society, and the complex processes of cultural continuity and change after the conquest. The focus is the material culture, in particular the indigenous ceramic technology. Ceramics is the category of material most abundant archeologically. In ancient Mesoamerica they were used in domestic contexts for cooking, serving, storing and transporting, and also played a major role in ritual activities as offerings, ritual equipment and even divine objects (Whitehouse 1996:13). They were also used as service ware for communal feasting; that is, ritualised events in which food is the principal medium of expression (Bauer 2001: 46-84; Dietler 1996: 89; Smith *et al.* 2003). The manufacture, morphology and decoration of ceramics as well as the context in which these artifacts are found, reflect the potters' conception about this craft, the available technology, and their use (Gosselain 2000; Stark 1998; van As 2004; van As *et al.* 2004). It also furnishes unique insights into cultural interaction and the process of development across time.

After the conquest, native ceramics retained their importance. Certain methods of manufacture, forms and decoration patterns disappeared; others were transformed as a result of newly introduced techniques, ideas and consumption patterns, as previous studies show (e.g., Charlton *et al.* 2005, 2007; Fournier 1996; Gasco 2005a; López Cervantes 1976). Still others remained virtually the same. At present many towns produce pottery that is closely related to that of pre-colonial times in technology, form or function (e.g., Arnold 2008; Druc 2000; Engelbrecht 1987; Hernández 2007; Kaplan 1994; Lackey 1981; Papousek 1981; Rendón 1950). Consequently, in this complex and varied socio-historical panorama, I believe that ceramics are a rich and viable medium to explore and explain the effects of technological, social, economic and cultural changes as well as the mechanisms of

the processes of continuity and transformation of the indigenous culture.

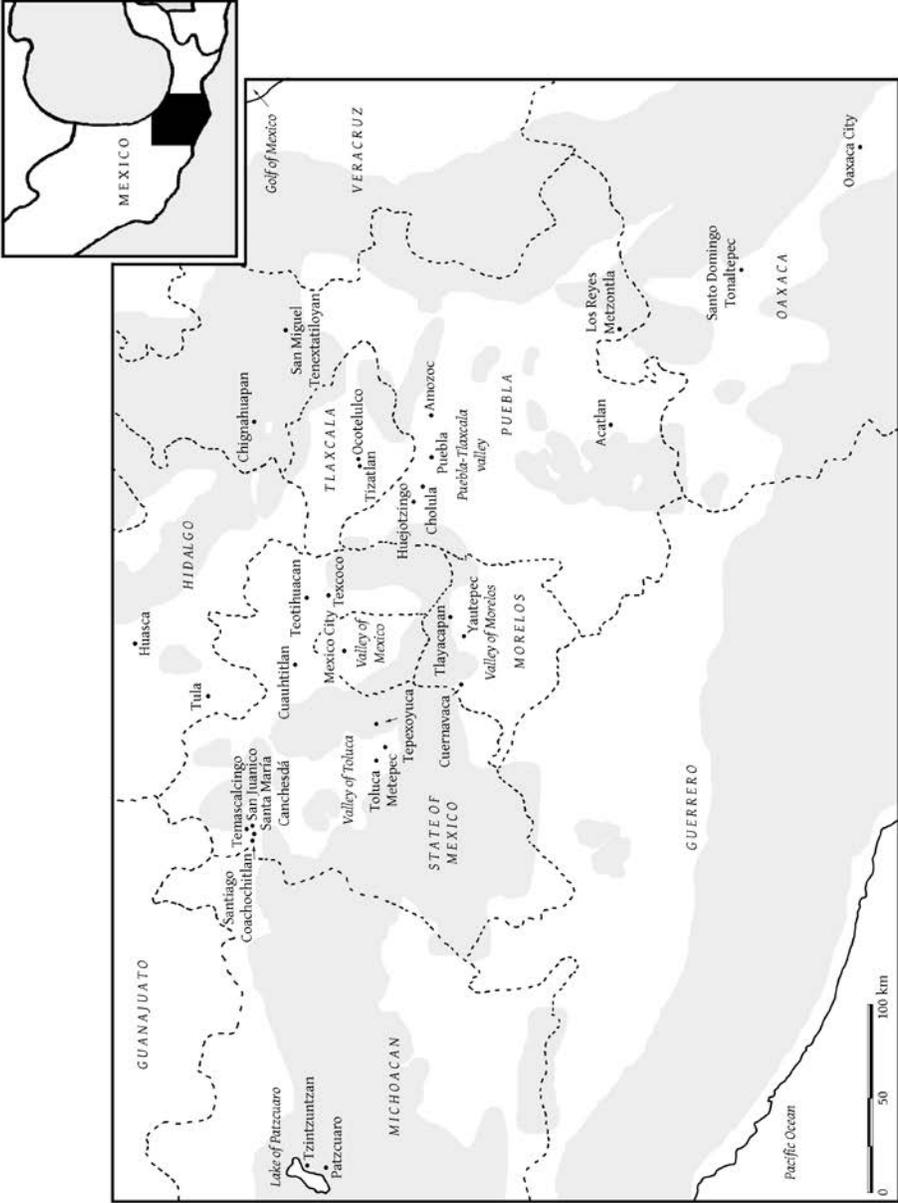
During the first colonial decades the production or trade of native ceramics did not attract the colonizers (Gibson 1964:335), as they were looking for other means to make money. Ceramic-making was apparently a common activity that did not promise high profit, as the archaeological record shows that the products were mostly for quotidian and simple uses (e.g., Charlton *et al.* 2007; Fournier 1996). Therefore colonial politics did not openly interfere in the development of this industry, as Charles Gibson (1964:335) has inferred from documentary data. Nevertheless, the enormous impact of the conquest on essential aspects of indigenous life such as land tenure, religion, language and the system of administration apparently had general effects on ceramic-making, as it will be shown later. Thus, this study focuses on an aspect of culture that was not central in the process of colonization, but does reflect the effects of the conquest on the daily life as well as the creative role of the indigenous society. In that way ceramics offer other perspective of the situation during the colonial era.

In addition, the indigenous ceramic technology coexisted with the Spanish ceramic technology introduced by the colonizers in the first decades of the early colonial period (e.g., Charlton *et al.* 2007; Gámez 2003; Goggin 1968; Gómez and Fernández 2007; González 1988; Hernández *et al.* 1988; Lister and Lister 1978, 1982, 1987). We still do not exactly know when the Spanish ceramic technology arrived to Mexico, as this industry is scarcely mentioned in early colonial documentation, and ceramic remains do not offer fine chronological details. As it will be discussed later, an early document of Alonso Figueroa suggests that by 1529 he was experimenting in the production of glazed ceramics in Mexico (the glazing technique was a clear Spanish introduction, as it was not used in pre-conquest Mesoamerica). However, as he says, wares were still imported from Spain (López Cervantes 1976:15). A few later sources, the *Florentine Codex* (Sahagún 1961, X: 839) [apparently prepared as early as 1547 and completed in 1569 (D'Olwer and Cline 1973:193)], the *Historia Eclesiástica Indiana* (Mendieta 1980 [1571-1596]: 404) and a letter of Viceroy Lorenzo Suárez de Peralta dated in 1583 (Cervantes 1939: I, 18); show that by 1570s-1580s the production of glazed wares was already established in the colony. Mendieta (1980:404) also mentions that a pottery master from Spain settled in the colony. We can infer that he, or other Spanish potters, started a workshop for Spanish-style ceramics, such as

Majolica ware, and introduced the potters' wheel. Meanwhile indigenous potters continued producing their typical ceramics in their own workshops using pre-colonial methods, as manufacture marks in archaeological ceramics show. The interaction between both traditions was reflected in the ceramic vessels. Thus, these materials are also useful media to explore the encounter between different technologies and artistic styles.

The regional focus of this study is central Mexico; in particular the area of the Nahua (Aztec) peoples (Map 1). Central Mexico was the political and cultural core area both in pre-colonial and in colonial times, thus, colonization was very pervasive there. As most of the extant archeological collections and documents are from the valley of Mexico, a major part of this study is focused on that region. However, extant data from the valley of Puebla-Tlaxcala, the valley of Toluca and the valley of Morelos are also considered. This study is based on the synthesis and integration of previous information, the non-systematic consulting of several extant and available collections of ceramics from that region as well as fieldwork research in present-day pottery towns.

The temporal focus of this study is divided into three sections: the late pre-colonial period, the early colonial period and the present-day. The late pre-colonial period, in particular the Late Aztec era, is included in order to show how the native ceramic tradition changed, or not, after the conquest. In this part, the center of attention is ceramic-making in the valley of Mexico, although the situation in neighboring valleys is also briefly explored. The main reason is that more research has been done in the valley of Mexico (e.g., Blanton and Parsons 1971; Cervantes and Fournier 1995; Cervantes *et al.* 2007; Charlton *et al.* 2008; Garraty 2006a, 2006b; González 1988; Hodge and Minc 1990; Hodge *et al.* 1992; Matos Moctezuma 1982; Minc *et al.* 1994; Nichols *et al.* 2002; Noguera 1934, 1969; Parsons 1966; Parsons *et al.* 1982, 2008; Sanders *et al.* 1970, 1979; Sejourne 1970, 1983; Vega 1975; Whalen and Parsons 1982). The study of indigenous ceramics in the early colonial period is almost completely focused in that region because there have been several studies of the material culture of early colonial contexts (e.g., Charlton *et al.* 1995, 2005, 2007; Fournier 1990, 1997; Matos Moctezuma 1982, 1999; Rodríguez Alegría 2005); while little archeological research has been conducted and published in other valleys of central Mexico (exceptions are Müller 1973, 1981; and the unpublished INAH reports: Charlton *et al.* 1987; Hernández



Map 1. Central Mexico showing the places mentioned in the text.

2000a, 2000b; Hernández and Reynoso 1999). The late colonial period is not considered here because the main purpose of this part of the research is to explore how the native ceramic technology reacted to the new colonial society and to the encounter with other ceramic technology in the first hundred years after the conquest. That is, in the period during which—despite the conquest—little changed in the indigenous communities of central Mexico (Lockhart 1992:42). In addition, our knowledge of indigenous ceramics of the late colonial period is still limited, as archeological contexts of that time are mixed or cannot be separated into short intervals of time (e.g., Charlton 1970, 1976, 1977; Müller 1979). The study of indigenous-style ceramics from the present-day is based on fieldwork research in several pottery towns of central Mexico, in particular in those places specialized in the manufacture of lead glazed vessels in which this industry is flourishing and knowledge continues to be transmitted to younger generations. A number of towns were visited; some of them are the most important ceramic producers of central Mexico and others are in the process of decline. Although in these towns ceramics do not look as in the pre-Hispanic past, as we will see later, parts of the method of manufacture and organization of production are still intimately attached to the Mesoamerican world.

This study is concentrated on these three time periods although it is clear that between the early colonial era and the present time there is a large information gap of three hundred years. We have little knowledge of the indigenous-ceramic technology during that span of time (e.g., Charlton 1970, 1976, 1977; Hernández 2000a, 2000b; Hernández and Reynoso 1999; Müller 1979, 1981; Sáenz 2004). For this reason, in some cases we do not know how old, or new, certain parts of the present process of manufacture or certain attributes of contemporary vessels are. In addition, the three time periods here considered have different sources of information and methods of study. The examination of the late pre-colonial period is entirely based on the analysis of archeological ceramic fragments. Previous research is wide and the extant collections of materials are abundant. In particular in the valley of Mexico there has been systematic and extensive documentation of the style, form and temporal allocation of ceramics (Blanton and Parsons 1971; Parsons *et al.* 2008; Parsons *et al.* 1982; Sanders *et al.* 1970, 1979). Also technological methods, such as compositional analysis, have been conducted in order to identify the distribution and exchange of those objects (e.g., Charlton *et al.* 2008; Garraty 2006a,

2006b; Hodge and Minc 1990; Hodge *et al.* 1992; Minc *et al.* 1994; Nichols *et al.* 2002). The investigation of the early colonial period is also based on archeological ceramics but much fewer studies have been carried out. There are few extant archeological collections, and most of them come from the valley of Mexico (e.g., Fournier 1990; Matos Moctezuma 1982, 1999). However, in this region archeological contexts are often mixed due to uninterrupted building activity in Mexico City and its surroundings, and for this reason, we do not have much detail on the development of the indigenous ceramic industry throughout that period. In neighboring valleys archeological research is scarce or not published.

In addition, the study of the ceramics of early colonial times is complemented by a few documentary references. The *Códice de los Alfareros de Cuauhtitlan* is the only extant manuscript referring in particular to indigenous style ceramics. This document was presented in 1564 by four potters of Cuauhtitlan to the judge of the same town in order to complain about the *alcalde mayor*, who did not fully pay them for an order of pots. This brief manuscript with illustrations provides information about the kind of vessels produced at that time and the situation of indigenous pottery-making in the early colonial period. However, other documentary references are scarce, brief and scattered. In contrast, the examination of the present-day is based on fieldwork research in contemporary pottery towns and on information provided by the potters themselves. This is complemented with a number of previous studies which have documented the situation of this industry since the 1950s (e.g., Chávez and Camacho 1997; de la Vega 2007; Díaz 1966; Engelbrecht 1987; Espejel 1975:39; Foster 1959, 1967; Huitrón 1962; Kaplan 1994; Katz 1977; Lackey 1981; Moctezuma 2002; Papousek 1981; Rendón 1950).

Notwithstanding the differences in sources of information and methodologies, the study of these three time periods offers good insights into the long-term process of cultural continuity and change after the conquest. The impact of the conquest was not only evident in the first centuries after 1521. As we will see later, developments started at that time continued over many generations and are still recognizable at the present time. Thus, the main questions of this study are directed to improve our understanding of the active role of the indigenous society in the colonial intercultural interaction, and after it. How was the impact of the conquest on the indigenous ceramic technology? How did the indigenous and the Spanish ceramic traditions

interact? How did the various dimensions of ceramic-making react to the new colonial society? How is the present-day ceramic technology connected with the ancient Mesoamerican culture? How was the process of cultural continuity in this aspect of life? And finally, what are the perspectives of this industry today? Cultural continuity and change are topics often explored in studies of ancient ceramics in Mesoamerica. These materials have wide temporal and spatial distribution and changes in their technology, style or function are evident; for this reason, they offer excellent synchronic and diachronic insights into continuity and change (e.g., Gosselain 2000; van der Leeuw 1993; Wobst 1999). In this study we will also explore these aspects, although the main focus will be to understand better the process of cultural continuity.

Cultural continuity

The process of cultural continuity depends on the mechanisms existent in a particular culture for transmitting knowledge and experiences across generations. That is, it relies on the available media for remembering and forgetting. As Maurice Halbwachs (1992), Aleida and Jan Assmann (A. Assmann 1999, 2006; J. Assmann 1992, 2000), and Paul Connerton (1984) have studied in detail; all cultures have methods to associate past knowledge to the present time in a collective way. Following Jan Assmann (1992:16), this has two main functions. On the one side, shared memory promotes self-identification among the persons who integrate a society. On the other, the preservation of common memory makes it possible that a culture continues, even after political breaks. In this way remembering integrates people across space and time. This requires particular mechanisms and media to guarantee continuation for long spans of time and after persons are gone, as A. Assmann (2006:23-29) makes clear that it is not the same as the memory of individuals. According to her, individual memory is based on one's own experiences, but also on the experiences of others. It is related to quotidian knowledge, and is extended through communication and social interaction. However, it is short-lived as it expires after interaction disappears. In contrast, A. Assmann (2006:23-29) explains, collective memory is the process of remembering of social groups, like generations or members of a profession. These groups of persons share particular worldviews, values and standpoints as they

are influenced by similar historical and cultural processes at the same age or at the same social function. This kind of remembering is created through interaction and communication, and is also related to common and quotidian experiences. It is maintained during longer periods of time because one generation transmits knowledge to the following. However, when communication breaks, memory breaks. Cultural memory, she continues, has a much longer temporal dimension. It persists after individuals are gone as it uses symbolic media such as written texts and monuments but also rituals, dances or sacred narratives, which are over and over again performed and made special by their ceremonial context (A. Assmann 2006:34; J. Assmann 1992; Connerton 1984:72-104).

Collective and cultural memories are usually explicit. That is, they involve the subjective experience of remembering (Joyce 2003:106; van Dyke and Alcock 2003:4). Cultural memory, in particular, deals with commemoration, which is the deliberate marking of ideas, events, places or persons to be remembered (J. Assmann 1992:21). Thus, it is visible, public and declarative. This form of memory contrasts with the implicit memory, which refers to recalling or recognizing knowledge without being clearly aware of it, as is the case of skills or habits (Joyce 2003:106; van Dyke and Alcock 2003:4). As these authors remark, it is embodied in actions or incorporated in objects and is non-declarative. Understandings associated to both forms of remembering constitute what we call culture (for a discussion see Graña-Behrens 2009:22). Furthermore, explicit and implicit memories have material expressions. Therefore, it is possible to find evidence of ancient media of remembering in archeological contexts, and to use them for reconstructing the process of cultural continuity from the past to the present time. Typical material expressions of explicit memory are written texts, monuments and buildings while materializations of implicit memory are for example quotidian objects, houses or body ornaments. Breaks or alterations in the process of cultural remembering might also be manifested in material culture; a clear example is the removal or destruction of monuments. Also breaks of memory in relation to more common knowledge might be indicated in stylistic changes in ordinary artefacts, like ceramics. In addition, as Rosemary Joyce shows (2003), in some historical situations material signs of implicit memory may be transformed, so that they become explicit commemorative records.

After the conquest, several mechanisms of remembering of the Mesoamerican culture were transformed. In particular commemorative media, such as painted books, monuments or public religious rituals, were suppressed due to the effort to eliminate native religion and the introduction of alphabetic writing. However, the knowledge associated to them did not disappear. Those media were mnemonic aids to preserve and recall a vast ancient oral knowledge (Anders *et al.* 1994:97; Boone 1994:15-17; Grube and Arellano 1998:31-33; Jansen 1998:152; Jansen and Pérez Jiménez 2000, 2009; Monaghan 1994:88). Evidence of this is that, in the case of written texts, the painted signs were arranged using typical memory devices of speech production in societies where culture transmission is mainly oral (e.g., parallelisms, diphastic kennings, formulaic repetitions) (Adelaar and Muysken 2004; Fox 1988:1-11; Parry 1971). Due to this particularity the media to transmit this knowledge vanished after the conquest, but the knowledge itself did not disappear. It became confined to orality and merged with new understandings and experiences, as was recognized by colonial researchers (e.g., Balsalobre 1987; Ruiz de Alarcón 1987). Part of this knowledge has survived up to the present time in indigenous ceremonial contexts in Middle America, in particular in highly formal and metaphorical speeches in native languages used in several contexts. For example, in the Mixtec region, this is the case in communal, religious and domestic events in the form of gratitude and reverence speeches, consecrations and prayers (López García 2007). Such speeches contain central concepts of the indigenous worldview, and constitute the main form to transmit this knowledge across generations. In addition, they have an important social dimension as they are central elements of communal ceremonial life and identification.

While after the conquest commemorative and visible mechanisms of remembering were suppressed, other media less public, and less observed by the colonizers, were maintained. This was the case of ritual performance such as domestic ceremonies and the cult to natural elements of the landscape. In the seventeenth century Balsalobre (1987 [1629]) and Ruiz de Alarcón (1987 [1629]) documented in Guerrero ritual speeches related to those kind of ceremonies. They have also persisted into the present time (e.g., Dow 2001; Ichon 1973; McGee 1998; Stross 1998). In addition, implicit knowledge associated to several aspects of the daily life was maintained after the conquest. For example, in the valley of Mexico obsidian cutting tools in pre-Hispanic style continued to be made and used in early colonial times

(Rodríguez Alegría 2008:39-40). Also as we will see in this work, many early colonial ceramics were made with the same technology and style as in pre-conquest times. This shows that the process of remembering associated with quotidian technologies did not break after the conquest.

The process of cultural continuity was a complicated one, however. Cultural traits, like ceramics, are multidimensional. In my view, they are composed of several elements or layers, and each of them has its own dynamic of change and continuity. From a more technical perspective Olivier Gosselain explains (2000:191) that the different components of pottery *chaîne opératoires* do not involve similar processes of social interaction, and therefore important differences exist in their reproduction or change over time and space. As we will see in detail later, ceramic technology is not one cultural entity, but rather involves several dimensions, such as the organization of production, various stages of manufacturing as well as distribution and use of the products. Thus, it might well be that during a long span of time some dimensions are maintained as in the past while others are modified. The result can be that recent ceramic objects do not look as in the past although they maintain clear connections with ancient forms of organization, processes of manufacture or uses. As we will see in this work, after the conquest indigenous potters continued using pre-Hispanic forming methods and firing techniques while vessel shapes and decoration were modified. At present the so-called 'traditional' ceramics are still manufactured using pre-Hispanic methods, although in many cases objects look different to those of pre-colonial and colonial times as the shape and decoration have been notably modified.

If we recognize cultural continuity only in the pottery towns in which ceramics are made exactly as in ancient times, then we will see that this technology is declining. For example, a short visit to the pottery town of Santo Domingo Tonaltepec in the Mixtec highlands showed that there ceramics are manufactured as in the pre-conquest period. The method of forming, vessel shapes and decoration are as in the past, and for this reason, their association with the pre-Hispanic world is evident. Unfortunately, in this town ceramic-making is endangered. This craft is only practiced by older people. Knowledge is not transmitted to new generations because younger people need to go to the city to study or work, or migrate to the United States. Potters have difficulty commercializing their products as Tonaltepec is far from important communication roads and markets. This town is a

clear example of cultural continuity in pottery, but also of its present-day disappearance. Nevertheless, if we recognize cultural continuity also in pottery towns in which ceramics conserve several pre-Hispanic traits but also include many new elements, then we will see that this technology is flourishing. For example, in several pottery towns of central Mexico, like Metepec, Amozoc, Santa María Canchesdá or San Miguel Tenextatiloyan, ceramics do not look as in the past but conserve several traits of the ancient technology of manufacture. In these towns ceramic-making is a productive industry and knowledge continues to be transmitted to younger generations. In this case ceramic technology has connections with the ancient Mesoamerican world but also has perspectives for the future. Thus, these towns exemplify the complex process of cultural continuity/change, as some parts of the ceramic technology are maintained as in the past, others have been transformed as a result of the colonial intercultural interaction, and even others are new. In this work I will concentrate in these towns as in my opinion they exemplify better the development of this industry after the conquest. I will try to show that in those towns potters continue transmitting key elements of the Mesoamerican culture, even if they produce simple and quotidian ceramics which do not look as in pre-Hispanic times.

A note on some terms used

In this work the colonial era is separated into two main periods following Lockhart's division (1992:427): (1) the early colonial, from 1521 to 1640-50, during which—despite the conquest—little changed in the Nahua communities of central Mexico; at that time were introduced the Spanish political institution *cabildo*—concerned with the political organization of Spanish settlements and indigenous communities—the monasteries, and the labor draft called *repartimiento*. All of them promoted that many Spanish elements pervaded indigenous communities but with limitations, thus little changed in the indigenous framework. (2) The late colonial period, from 1640-50 to the independence in 1810, during which the indigenous peoples of central Mexico adopted new Spanish elements that more strongly affected their community organization and frameworks (Lockhart 1992:42). That time was marked with a recovery of the native population and the rising of mining production. Also the change of ruling dynasties in

Spain, from the Habsburg to the Bourbon, were followed by administrative and commercial reforms at the colony, implemented between 1760 and 1780, with the purpose of tightening the colonial bond and extracting more surplus (Knight 2002:202-206). In this work we will concentrate on the early colonial period because it is when the impact of the encounter between the Mesoamerican and Spanish worlds was more dramatic, and because ceramic-making is better documented for this period than for the late colonial epoch.

In this work 'indigenous-style' ceramics refers to vessels made with pre-Hispanic technology and with shapes and decorations derived from the pre-Hispanic ceramic tradition. In the same way, 'indigenous-style' workshop refers to those places of manufacture in which Mesoamerican methods were used. In contrast 'Spanish-style' ceramics refers to vessels made with European technology and with shapes and decoration derived from that tradition, even if they were made in Mesoamerica and if they were produced by non-Spanish potters. Also 'Spanish-style' workshop refers to those places in which Spanish methods of manufacture were used. The polar separation between indigenous-style and Spanish-style ceramics does not reflect the social complexity of the colonial society at that time, and probably also does not reflect the situation of the pottery technology. Nevertheless, as we will see later, colonial ceramics can be separated into two main groups, one associated with the Mesoamerican ceramic tradition and the other associated with the Spanish tradition. In that way these labels are useful to understand the development of this tradition during the early colonial period.

The term 'traditional' ceramics is used to refer to present-day objects in which the process of manufacture is similar to that in ancient times or the shape and decoration have maintained past attributes. In this context 'traditional' is not the same as static, conservative or backward. Often the label 'traditional' is given by the makers or users of these objects as they see them associated to the ancient culture. The term *artesanía* refers to ceramics made in a style considered by tourists or urban consumers as 'typical Mexican'. This kind of object is usually made for the tourist market, and often they are used only for decorative purposes. Ceramics made for domestic functions, such as *ollas*, *comales* or *cazuelas*, are not *artesanías* although in this work they do not receive a particular label.

Organization of this work

The main aim of this study is to explore the role of the indigenous culture in the process of colonization. For this purpose it will explore material culture, in particular ceramics, produced and used after the conquest. In this work we will be confronted with several facets of colonial encounters, such as unequal power relations, intercultural interaction, representation of different social components of the colonial society, cultural hybridity, as well as the diverse perspectives to understand all these phenomena. In this way the present work can be seen as a case study of the archaeology of colonialism. Therefore, Chapter 1 explores in some detail the fundamentals of the archaeology of colonialism. Particular attention is given to the post-colonial thinking, as this perspective offers new possibilities to understand better the transformation and continuity of the indigenous culture after the conquest. Chapter 2 explores recent theories and methods to study material culture. In the last years in the social sciences there has been a renewed interest in the theorization and study of material culture. After several decades of thinking centered on persons, more attention is now being given to things, as they are seen as active constituents of social life. In particular, this chapter will examine how the relationship between people and objects has been understood, and how material and social change has been related. In addition, it will present how the study of ceramic-making can be a viable way to approach social continuity and change.

Chapter 3 is dedicated to the analysis of the process of ceramic-making during the last centuries before the conquest in central Mexico, in particular during the Late Aztec period (AD 1325-1521), that is, the span of time from the foundation of Tenochtitlan till the Spanish conquest. This analysis synthesizes, integrates and evaluates extant information from previous ceramic studies in that region, especially in the valley of Mexico as more research has been conducted there. In addition, several collections of late pre-Hispanic ceramics from the valley of Mexico were consulted, in particular, the ceramic collections of the Basin of Mexico Archaeological Project conserved at the University of Chapingo, and part of the collections of the Teotihuacan Valley Project conserved in the laboratory of Arizona State University at San Juan Teotihuacan. The process of ceramic-making is divided into several stages of manufacture. These are the stages that can be reconstructed from visible manufacturing traces on

the vessels and from extant documents. In addition, two key topics for understanding the context of ceramic-making at that time are examined: the impact of the Aztec empire on this industry, and the use of ceramics as ritual objects and media of literacy.

Chapter 4 is devoted to the study of the process of ceramic-making during the early colonial period in central Mexico, that is, from AD 1521 to 1650. Most of the information corresponds to the valley of Mexico as the majority of the archeological research in early colonial contexts has been done in that area. This analysis is based on the synthesis and integration of previous research on ceramics, as well as on the non-systematic consulting of several archeological collections of early colonial ceramics from many contexts in the valley of Mexico deposited in the *Departamento de Colecciones Comparativas* at INAH in Mexico City. These collections consist of selected samples of diagnostic ceramics found in colonial locations all through the city. Some locations with large collections of indigenous and Spanish style ceramics were: Casa del Marqués del Apartado excavated by Elsa Hernández Pons in 1984-1987; Casa Limón No. 16 excavated by Octavio Corona Paredes in 1987-1990; Real Seminario de Minería, excavated by Arturo Guevara Sánchez in 1989; ex-convento de San Jerónimo excavated in 1994; ex-convento de Bethlemitas, excavated in 1993-1995 and 1998; San Idelfonso; Bancomer, Coyoacán, studied by Silvia Mesa Dávila; Plaza Banamex; Complejo Hidalgo, excavated by Francisco González Rul in 1979-1981; Catedral Metropolitana, ceramics studied by Constanza Vega Sosa in 1975-1976, and Garibaldi, explored in 1973. Although for most of these explorations and analysis of materials reports are not available, the ceramic collections represent a wide and varied sample of the pottery made and used in the city during the colonial period. Thus, they are useful to explore the technology of manufacture. In addition, two key topics to understand ceramic-making at that time are explored: the impact of the Spanish ceramic technology, and ceramics as indices of cultural affiliation in early colonial central Mexico.

Chapter 5 is dedicated to the study of present-day ceramic-making in central Mexico. The analysis is based in fieldwork research in several pottery towns of the region specialized in the manufacture of lead glaze ceramics. As will be later presented, this kind of object and its technology of manufacture is a continuation of the pre-Hispanic ceramic tradition in the region. This study is mainly focused on the following towns: Amozoc and San Miguel Tenextatiloyan in the state

of Puebla; Metepec, Barrio de Santa Cruz Texcoco, Santa María Canchedá, Santiago Cochochitlan and San Juanico in the state of Mexico, and Huasca in the state of Hidalgo. In most of these places pottery represents today the main source of income for many families and knowledge is still transmitted to younger generations. The study of the ceramic technology in these towns is based in several short fieldwork periods, at different times of the year, and consulting several family workshops. Also other less flourishing pottery towns were visited to complement this part of the study. In addition, two key topics to understand ceramic-making at that time are explored: the environmental impact of ceramic-making as well as the impact of institutional programs to promote this industry.

The last chapter is dedicated to the conclusions of this work. The guiding line is that after the conquest the Mesoamerican ceramic culture persisted, although this does not mean that it remained static, but rather that it developed and transformed in response to new circumstances, as the ceramic technology shows.

CHAPTER ONE

ARCHAEOLOGY OF COLONIALISM

Colonies, colonization and colonialism

One of the first publications discussing the connotation of the above terms appears as late as 1976. M.I. Finley (1976:184), an English scholar concerned with the lack of precision in the use of the term colony in British political circles, offered a definition in the Royal Historical Society. For him, a colony refers to a settlement created through large-scale immigration from a homeland, which had appropriated land from the indigenous population, subjugating them in the process, controlling their labor force and instituting formal political and economic control from the homeland. A disparity in the scale and potency of the two parties to the colonial encounter was crucial, with native peoples seen as technically backward, small-scale in their political organization and incapable of concerted action, as compared with their European conquerors. According to Finley migration and domination were distinctive ingredients.

More recent examinations, such as those of Christopher Gosden (2004a:2) and Gil Stein (2005:8), propose that colonization involves a metropolitan power which sends people out to a geographically distant and culturally different area. According to them, motives for establishing colonies include trade, the desire to disperse excess population, military advantage or control of local resources. Political control might be loosely exercised, or colonies might be bound more tightly into imperial structures. Gosden (2004a:26-31) further distinguishes different types of colonies according to three levels of acculturation; the first characterized by mass death of the native population and the introduction of the colonizer's technology, and the last by shared cultural milieu between colonized and colonizers. Although he recognizes variations in the control of power, this aspect does not have a central role in his definition. Peter van Dommelen (1997, 2005, 2006a), in contrast, suggests that colonial encounters should be differentiated between colonization and colonialism. The first refers to movements of people, as described by Gosden and Stein. The second

implies the existence of asymmetrical socio-economic relationships of domination or exploitation; although it also characteristically involves the presence of one or more groups of foreign people in a region at some distance from their place of origin. Colonial relations between Mesoamerica and Spain in the sixteenth century can be included in the category of colonialism, but in my opinion they still require more specification.

Jürgen Osterhammel (2006:19) explains colonialism based on the European colonial politics after the sixteenth century. For him it implies control through people of another culture. It is a relationship between lords and servers in which the historical self-development of a whole society is stolen, controlled by foreigners and directed to the interests, mainly economic, of colonial lords. In this relationship the level of strangeness between colonizers and colonized is very relevant. From the colonized is expected acculturation to the values and habits of the colonizers; however, there is not an important contra-acculturation on the part of the colonizers through loans from the controlled civilization. In addition, colonialism is not only a relationship between lords and servers, but it is also a special interpretation of this relationship. The Spanish colonization of Mesoamerica is an example of this kind of intercultural encounter. However, recent research on ancient and modern colonialism suggests that the straightforward association of colonialism with domination, conquest and resistance, as it is manifested in Osterhammel's definition, may not be true (Rowlands 1998:330). There seems to be some ambivalence (see e.g., Funari 2004; Jordan and Schrire 2002; Thomas 2002; van Dommelen 2005). In addition, often native people do actively participate in the formation of the new colonial society (see e.g., Edgerton 2001; Gasco 2005a; Given 2004; Lockhart 1992).

The colonialist perspective to interpret colonial relations to which Osterhammel refers is typically based on the model of acculturation. That is, the native population is seen as receiving technical, cultural and economic introductions from the colonizers. In this view, colonizers actively stimulate processes while colonized passively benefit, adapt or neglect them. In addition, colonizers are seen separated from colonized. This creates a dualistic panorama that does not coincide with colonial reality, as it loses all details and variations in-between. As van Dommelen (2005:116) and Rowlands (1998:331) point out, it overlooks much of the social dynamics of colonial situations. And more important, it also reproduces the distinction, or sense of strange-

ness, between the indigenous population and the colonizers that the latter insistently promoted. Studies of ancient colonial societies show that colonies were heterogeneous; they were composed of more different people than colonized and colonizers, and they had a variety of social identities which could be interchangeable according to the situation (e.g., Bauer 2001:75, 81; Lightfoot 1995:201; van Dommelen 2005:116). Indigenous and foreign people got married and had children; and established work relations that varied from gruesome slavery to economic partnerships. Those aspects may be, or not, taken into account in the study of colonial societies. If such a society is not seen as heterogeneous and if the roles of the various social groups are not seen as relevant, then the representation of the colonial culture may not only reproduce colonial stereotypes, but may also be incorrect and unequal. Post-colonial thinking has been precisely concerned with this subject.

Post-colonial thinking

At the core of historical reconstructions of colonial encounters, such as that between Mesoamerica and Spain in the sixteenth and seventeenth centuries, is the issue of *cultural representation*. That is, the particular roles that scholars, observers, documents, etc. attribute to the various social groups in the formation of the new colonial society. Some social groups may be represented as active agents, while other may be seen as passive receptors or may be even neglected, and this gives way to particular perspectives of those periods. In the case of the study of colonialism representation is not only a question of methodology, but also of responsibility, as a biased and unequal point of view in writing history contributes to maintain colonial relations. Post-colonial thinking has examined this problematic in detail, as it was precisely an intellectual reaction to the imbalance in cultural representation in the modern world.

The publication of Edward Said's *Orientalism* in 1978 is considered the starting point of this thinking. He argued that orientalism was the European way to view the Orient. This discourse was a sign of European-Atlantic power over the Orient originating in an era of colonialism, rather than a veridical discourse about the Orient. It was designed for readers in the metropolitan west, while it never intended to have an Oriental as reader (Said 1995:1, 6). Thus Said, and the other

two main thinkers of this approach, Gayatri Spivak (1985) and Homi Bhabha (1989), called “post-colonial discourse” the act of rethinking and re-formulating historical experiences which had once been based on geographical separation of peoples and cultures. They claimed that a few countries controlled the representation of culture while the rest of the world was not only underrepresented, but also misrepresented. Such hegemonic ideologies reinforced colonial stereotypes, made polarized distinctions between the ‘we’ and the ‘other’, and considered the first as the model and direction of civilization.

An effect of these ideas was Homi Bhabha’s essays compiled in the *Location of Culture* (1989), in which he analyzed his own experiences as colonized. Another effect was the creation of alternative histories; that is, to write history from the perspective of those not mentioned in the history as commoners, oppressed or marginalized. I refer in particular to the ‘subaltern studies group’ conformed by Asian intellectuals studying in the United States who were not satisfied with the current treatment of Indian history, and therefore began to write history from below (e.g., Guha 1982; Spivak 1985). They gave particular attention to resistance, rebellion, and other active responses to domination in order to reply to the colonial stereotype that the ‘other’ was passive. Although critics consider this group as elitist and its writings as abstract and far from Indian historical context (Parry 1994), it has been a significant influence in the social sciences as it introduced alternative frameworks to view history and culture (see Moore-Gilbert 1997:74-151).

Hybridity and hybridization

Bhabha (1989) was one of the first to draw attention to the erroneous dualistic representation of colonial reality. He argued that in colonial and post-colonial situations people and their actions are often a mixture of differences and similarities that relate them to both colonial and indigenous backgrounds without equating them entirely with either. He called this process cultural hybridity. This was strongly related to ambiguity and ambivalence, both central experiences of people living in colonial situations (Bhabha 1989:66). The colonized had links to the indigenous pre-colonial world and to the colonizing world, but did not feel completely identified to either of them. According to him this ambiguity of affiliations was a consequence of a pro-

found tension between the civilizing mission of the European colonizers and their need to maintain a clear distinction between colonizers and colonized. This was not exclusive to Bhabha's Indian colonial past, but characteristic of colonial and post-colonial societies elsewhere. A brief look at colonial Mesoamerica shows that only in the first decades after the contact there were two cohesive and separated social groups. In urban centers there emerged a complex colonial society formed by persons with different and changeable social identifications (see Gibson 1964:144; Knight 2002:29-30; Lockhart 1992:433).

In recent years the ideas of Bhabha have received more attention. There is a growing interest in redefining the various 'others' and the various 'selves' in colonial situations (e.g., Celestini and Mittelbauer 2003:12; Gosden 2004b:171-172; Lyons and Papadopoulos 2002:7; Prabhu 2007:12; Young 1995:25). Hybridity is seen an appropriate conceptual tool to refer to the specific in-between situation of colonial and post-colonial societies. However, in my opinion, if it is indistinctly applied to everything that seems to be syncretic or a fusion of elements, it loses its significance. In addition, it has been criticized that the term hybridity refers more to cultures than to people and actions (Friedman 1999:245-51; Parry 1994). For this reason, van Dommelen (2005:117) introduced the term hybridization, which refers to the process of creation of hybrid cultures, and therefore to individuals who actively create colonial relations. I believe that a more problematic aspect of hybridity is that it seems to be a label applied from outside to people living in a colonial or post-colonial society. From outside, life and identities in present-day Mexico may appear hybrid. From inside probably not; people recognize themselves as Mexicans, although they also recognize that this concept imply a wide range of social and cultural variation. Certainly people feel native, but there are many definitions of what it implies.

Thus, the way in which colonial encounters are reconstructed depends in large part on how the various social participants are viewed and represented, and on how the colonial society is understood. This is related to the theoretical frames used, but also to the nature of the sources of information.

Archaeology of colonialism

The study of colonial encounters, in particular of those that occurred after the fifteenth century, has been strongly based on documentary evidence. In the case of Mesoamerica, there is a vast and varied corpus of written texts. The earliest of them were made in large part by the colonizers and for colonizing purposes, but there were also indigenous manuscripts with indigenous aims, and later in the colonial period there was produced a copious documentation by a variety of peoples and purposes. The extant body of written texts of colonial Mesoamerica offers a rich panorama of the history at that time. However, when documents are the only source to reconstruct colonial situations the risk to create an imbalanced representation of the society may be considerable. Texts show a biased view of the history. They were written by particular persons, with particular worldviews and intentions, and this can be problematic when the texts studied were written only by the colonizers.

In comparison, artifacts, buildings and material culture in general provide a more representative vision of the history. They also offer a wider perspective on different aspects of colonial societies that are usually not mentioned in documents. For example, day-to-day domestic activities, common industries such as ceramic-making or consume patterns. For this reason, in the last decade there has been a notable interest in the analysis of material culture from colonial encounters. Many of these studies have been nurtured by postcolonial thinking (e.g., Funari 2004; Given 2004; Gosden 1997, 2004a, 2004b; Lightfoot 2005; Lyons and Papadapoulos 2002; Rowlands 1998; Stein 2005; van Dommelen 1997, 2005, 2006a, 2006b). Thus, archaeological artifacts have been used to explore how different participants of the new colonial society acted (e.g., Gasco 2005a; Jordan and Schrire 2002; Lightfoot *et al.* 1998; van Dommelen 2005), and how native material culture reacted to the new situation (e.g., Charlton *et al.* 2005, 2008; Fournier 1996; Gasco 2005a). However, the study of colonial material culture may also result in unequal views of the society. This may be the case when only the influence of the colonizers' objects on the colonized' objects is investigated. Also when a straightforward connection between colonizers/colonized and particular material culture is done; for example, in the case of Mesoamerica, between Spanish style ceramics, Spanish potters and Spanish users.

In a discussion of the archeology of colonial encounters in the Americas, Pedro Funari argues (2004:21) that the connection between material culture and ethnicity is based on a homogenous understanding of culture. Thus, direct association of certain artifacts with colonized and other artifacts with colonizers obscures the understanding of hybridization processes. It also restricts the possibility to visualize how different people reacted in a colonial society. Artifacts may be associated to a variety of people. Using the words of Jordan and Schrire (2002: 242), material culture represents certain incongruence, as simultaneously it reflects various intentions, actions, and social signals. Furthermore, native people may change functions and values of pre-colonial artifacts in the new colonial society, as Nicholas Thomas (1991:108) identified in his study of colonial encounters between South Pacific Islanders and Europeans in the nineteenth century. Also, he adds, in a colony the artifacts of the colonizers can be used in a different way from what their metropolitan producers had in mind. In view of the variety of associations of colonial material culture, it is simply a colonial stereotype to believe that resistance consists in clinging tenaciously to the traditional culture in the face of attempted assimilation by the colonizers (for a discussion see Given 2004:11). Thus, the study of material culture opens the possibility for new perspectives of the process of colonialism. Although in Mesoamerica the reconstruction of the colonial past has relied strongly on documentary data, it has also been enriched with the study of objects.

The archaeology of colonialism in Mesoamerica

The sixteenth century encounter between indigenous peoples and Spaniards in Mesoamerica resulted in a complex three-hundred-years long colonial period. At present our knowledge of the enormous cultural and social transformation of that time is considerable. Thanks to the existence of a wide corpus of chronicles and other historical documents many aspects of the impact of the conquest on the indigenous society are well studied (e.g., Gibson 1964; Lockhart 1992; Terraciano 2001). However, the abundance of textual information has been in a certain way also a handicap. Some aspects of the colonial life, such as the day-to-day activities of common people, the situation of native crafts or objects' consume have received little attention. Nevertheless, in the last decades the study of material culture, parallel to the study of

documents, has opened the possibility to furnish insights into those other aspects, and therefore, to provide a more representative view of the colonial society (e.g., Alexander 2005; Kepecs 2005; Rodríguez Alegría 2003, 2005). In addition, archaeological artifacts offer good possibilities for diachronical analysis, and this has permitted to approach in more detail continuity and change of material culture (e.g., Charlton *et al.* 2005).

The archaeology of colonialism in Mesoamerica had its starting point in 1934, when Eduardo Noguera published an analysis of ceramics found in the area around the Aztec Templo Mayor. Many of those ceramic remains corresponded to colonial deposits placed after destruction of the Aztec buildings. Noguera briefly described changes and continuities of indigenous ceramics after the conquest with the aim of understanding the transition between pre- and post- Hispanic ceramic traditions. This line of research has continued until the present time. After this early start, the archaeology of colonialism in Mexico again receives attention in the 1960s (see Fournier 1999; Fournier and Miranda 1992:76). However it is still in early stages. In comparison to the well-developed pre-Hispanic archaeology, archaeology of colonial contexts requires more case studies to elaborate chronological schemes and to characterize typical architecture and material culture of that period. Also, many of the extant studies have concentrated on the Spanish contributions to the indigenous world (e.g. Gámez 2003; Goggin 1968; Gómez and Fernández 2005, 2007; Lister and Lister 1974, 1978, 1982, 1987; López Cervantes 1976), while native responses to the colonial society have received less attention (important exceptions are Charlton and Fournier 1993; Charlton *et al.* 1995, 2005, 2008; Fournier 1997; Gasco 2005b; Rodríguez Alegría 2005, 2008).

Most of the archeology of the colonial period in Mesoamerica has concentrated in the valley of Mexico, mainly in Mexico City. There are several reasons for this; the majority of the impressive architectural works of the colonial period are located in this city, which after being capital of the Aztec empire turned into the seat of the Spanish viceroyalty. Rescue of buildings has motivated most of the study of colonial architecture (e.g., García and Juárez 1985; Hernández 1982; Hernández and López 1987). Occasionally these projects have included analysis of part of the recovered artifacts, in particular ceramics (e.g., Fournier 1990; Hernández *et al.* 1988). Also, in the last decades in this city there have been large infrastructure projects, such

as the introduction of deep drainage and electricity and underground telephone cable, as well as conservation projects of important colonial buildings such as the Metropolitan Cathedral. Many of these projects have included archeological rescues (e.g., Matos Moctezuma 1999, 2003). In addition, at the end of the 1970s a well-funded long-term excavation project of the Aztec Templo Mayor was started, which among many other aspects, included the study of colonial materials deposited in that location (e.g., Matos Moctezuma 1982).

Outside the valley of Mexico there have been a few archeological projects on colonial contexts. Some of them have focused on conservation, and study, of colonial architecture, but have also included analysis of recovered materials. For example, the restoration project of the Paseo del Río San Francisco in Puebla (Aguirre *et al.* 1996-1997), of various haciendas in Yucatán (Andrews 1981; Benavides 1985), or of several churches in the city of Puebla (Hernández 2000a, 2000b). Although these studies have concentrated on few buildings, and are based on scarce or even inexistent previous knowledge of the colonial material culture of the region, they offer a local view of that period, and are important antecedents for future research. In the Maya area there have been several investigations with a more regional scope. In Chiapas, especially in the Soconusco area, Janine Gasco (1992; 2005a, 2005b) used colonial architecture and artifacts to approach different consequences of the Spanish colonialism across the region. Susan Kepecs (1997, 2005) considered material evidences to explore in the small Chikinchel region in north-eastern Yucatán the economic aspects of the shift from Maya to Spanish rule. Also Rani Alexander (2005) has studied Postclassic and early colonial material evidences in south-western Campeche in order to analyze the Maya role during the Spanish colonization.

All these studies show that indigenous agency in the colonial society was complex and varied. Also they evidence that the analysis of material culture can be an important contribution to a more balanced -and correct- representation of the colonial world. More research in the valley of Mexico and in different regions of Mesoamerica will permit to achieve a better understanding of how the changes in native material culture, from the pre-colonial to the colonial period, are related to the social dynamics and interaction of different ethnic and cultural elements in post-conquest society. This book aims precisely to be a contribution to this subject.

CHAPTER TWO

THE STUDY OF MATERIAL CULTURE

The study of material culture

Since the beginning of the twenty-first century there has been in the social sciences a renewed interest in the theorization and study of material culture. After several decades of thinking centered on persons, more attention is now being given to things, as they are seen as important, and active, constituents of social life. This interest is by no means new. In the nineteenth century European collectors already studied systematically ancient and exotic objects, and this resulted in the creation of the theoretical basis of archaeology. The current examination of material culture, nevertheless, focuses on new questions such as if objects have agency or if the definition of materiality is culturally determined. Also at present artifacts are considered important sources of information to study contexts previously approached through other media such as documents or architecture; for example, the new archeological studies of colonialism centered on material culture.

In the social sciences there have been various views on the significance of material culture in the study of society. These perceptions have mainly depended on how the relationship between subjects and objects, persons and things, humans and non-humans is understood. Webb Keane recognizes (2006:197) four basic perspectives in modern times: (a) a position focused on production, represented in particular by Marxist theory, which assumes that subjects in pre-capitalist societies realized themselves through transformation of nature into objects, while under capitalism objects are seen as external to subjects; (b) a position based on representation, mainly represented by the Structuralism of Durkheim and Mauss, in which objects are seen as reproductions of the worldview and social order of subjects; (c) a position based on development in which subjects develop as a result of encounters with objects, this is mainly represented by psychological approaches that emphasize the central role of objects in persons, as fetishes and providers of new sensory experiences, and (d) a position

based on the extension of subjects through objects, mainly represented by Post-structuralist thinking in which objects are attributed with qualities of subjects, in particular with agency, and for this reason, they are able to realize and extend subjects.

At present this last view is becoming more common in social studies. Recent investigations are based on the assumption that material objects have characteristics of subjects, such as agency and complex intentionality (Hoskins 2006:74), and that things constitute rather than reflect social realities (e.g., Gosden 2006:437; Guarinello 2005:20; Keane 2006:199; Sofaer 2007:2; Tilley 2002:23). These thoughts have been the result of two influential works: Arjun Appadurai's collection of papers *The Social Life of Things* (1986) and Alfred Gell's *Art and Agency* (1998). The contributors to the Appadurai volume, at that time provocatively, looked at things as if they led social lives. By focusing on exchange and circulation, they explored the ways in which people find value in things, and things give value to social relations. In the same manner, Gell proposed that art is produced in order to influence thoughts and actions of people. Once a piece of art is created, it becomes agency because it produces effects on individuals. In this view it is believed that people and material culture maintain a dialectical relation, and therefore objects are able to influence actions of people, and can be active agents in creating social relations. This can be the case in colonial encounters as, for example, in early colonial Mesoamerica native potters were inspired by the new Spanish attires and began to produce figurines representing Spanish lords -with huts, beards, and Spanish haircut-, ladies -with long dresses, huts and children-, and animals -horses, donkeys, dogs- (Barlow 1990; Charlton *et al.* 2007:456-458; Otis Charlton 1995; von Winning 1988). These new stylistic attributes gave way to new functions and relations between persons and figurines, as they began to be incorporated in the Christian ritual in Crèche scenes that became popular in Europe by the mid-1500 (Charlton *et al.* 2005:62).

In addition, objects may have different roles and meanings in different social contexts (see Appadurai 1986). As Fred Myers (2001:6) argues, the value attributed to objects is movable and therefore problematic. That is, artifacts can be considered in some situations commodities while in others they are viewed as valuables. Following Thomas (1991:103), if the links between an object and its producers or former owners are erased, uninteresting or inconsequential, then it can be considered a commodity. In contrast, objects that have

embedded stories about their sources, users and producers are valuable. Finely decorated ceramics, for example, can be in certain contexts valuable as they may be associated to particular past celebrations or to well-known producers. On the other hand, plain ceramics for daily uses are often only commodities. In some historical processes, however, the values, and roles, assigned to objects can be more complex and even incongruent. For example, in colonial South African Cape of Good Hope, coarse ware locally produced by European potters provoked a variety of responses, as it was part of the mechanisms to define and redefine identities of both colonizers and colonized (Jordan and Schrire 2002:265). In view of that, the relationship between material change and social change may be more complex than we have thought.

Change in material culture

Material change has not only been studied from different perspectives but also from different emotions. Some scholars have perceived material change as positive, as they have equated it to progress. George Foster (1962:5), for example, as an anthropologist working in several countries for development projects of the United States, assumed that in less industrialized places changes in technology and artifacts led to progress and to a better standard of living. In his opinion, such progressive change was desirable to people everywhere. In contrast, other scholars have perceived material change as negative. As Victor Buchli (2002:8) explains, the rapid transformations consequence of industrialization provoked that changes in material culture were seen with nostalgia, as loss. Such melancholic perception of change has often contrasted with the ideas that producers and users of particular artifacts have about change. In Mesoamerica, for example, the present decline of ceramics for household purposes in favor of metal, porcelain and plastic artifacts is usually seen as improvement by their users, but as decay by archeologists. This shows that the argumentation around change, present welfare and cultural heritage is complex, and often made only from the standpoint of the researcher.

Material change, and its relation to social change, has been studied from different perspectives over the last fifty years. During the 1960s and 1970s, for example, a common model was that change occurred when a component of a particular social, economic or ecological

system was altered, and such alteration could result in the modification of artifacts (e.g., Binford and Binford 1968; Flannery 1968). During the 1980s and 1990s this systemic thinking was replaced by models centered on the agency of people (e.g., Giddens 1979). That is, it was held that individuals take decisions that provoke changes, including material changes. In contrast, a more recent perspective suggests that material culture can be an agent of change. Gosden (2006:425), in a discussion of long-term change, argues that objects, especially in terms of their forms and styles, have a longer life than humans. In consequence, he explains, we learn crucially from things, not only from people. That is, we are taught by people how to make and use things, but we really learn from the form things take and from the manner in which they are made. Thus, for Gosden, objects may guide people to shape short-term processes and events. In this argument things, rather than being considered intermediaries or products of human ideas, are viewed as kind of autonomous entities. Producers of artifacts innovate because they learn new ideas from other people and because they have creative inspiration, but also because they are influenced by other artifacts that they want, or reject, to imitate. In this perspective the relationship between social and material change is seen as dialectical and complex.

Change is intrinsically related to conservatism. For this reason, many studies of material culture change have also considered material conservatism. The bipolar approach 'change and continuity' is widely extended in the analysis of past and present objects. This view, however, may be problematic for several reasons. It presupposes that change and continuity are processes independent of the perception of the observer. For example, an archeologist identifies changes in ceramics morphology while producers and users affirm that they are the same as in the past. Also, change and conservatism are viewed as polar oppositions, although examples of the material world show that there is often a continuum between both trends and it is not easy to find a division line. In addition, conservatism is habitually considered as lack of change, as a kind of static state. However, the conservative reproduction of culture is also a form of action, as Judith Farquhar (2006:154) argues in her analysis of food and eating cultures worldwide. This is particularly evident in colonial encounters in which native people choose to maintain their material culture in order to preserve elements of self-recognition and sources of thrust in the new colonial society. Furthermore, this bipolar perspective suggests that

change, mainly of material culture, is monolithic. However, when artifacts, and their manufacturing technologies, are observed through long spans of time, it can be identified that they have various dimensions of change and conservatism, in addition to various perceptions of such dynamics of continuity and change.

Ceramics have often been used to explore social change and continuity in the past as they are well represented in the archeological record and can be associated to many different users and uses. However, as Rice (1984:234) explains, ceramics do not reliably and predictably accompany social change. This seems to be the case when regional pottery assemblages show important stylistic changes that do not correspond with shifts in other aspects of culture such as architecture or stone technologies, or when a certain kind of pottery remains stable during long spans of time although important political and economic changes occurred. In my opinion the perception of lack of direct association between material and social change may be the result of the nature of the studies that have been carried out. That is, most investigation on change in ceramics has only focused on final products, in other words, on the final visual appearance of artifacts. However, when the different steps of the process of manufacture of certain objects are considered (e.g., selection of raw materials, forming methods, morphology, decoration, etc.), another perspective emerges (see Gosselain 2000; Stark 1998; van der Leeuw 1993). As we will explore in this work, different dimensions of change and continuity can be detected; some of them correlate with certain aspects of social change while others do not. Also if the study of different phases of the biography of artifacts is extended to include distribution, use and disposal, different dimensions of change and continuity will also be detected. Therefore a study of material culture, in this case ceramics, designed to recognize patterns of change and continuity is more consistent when various steps of the process of manufacture are separately examined.

A method to study change in material culture

The idea that material culture contains various dimensions of change and continuity is not new. Erwin Panofski (1955) already claimed that in situations of cultural change, artistic forms may change, or meaning may change, but both do not necessarily change together. Material

change, however, seems to be more complex as he suggested, as not only form and meaning change at different rates and scales, but also the form of artifacts has several components that change in variable ways. In this context, the study of technological change offers the possibility to get a better understanding of material change and its correlation to social change. A useful method is the analysis of the *chaîne opératoire*. This term refers to a series of operations which brings a primary material from its natural state to a fabricated state (Cresswell 1976:6; Lemmonier 1986:149). The idea is that every operational step for producing an artifact involves various choices by the producer, which are relatively independent of previous or later choices. Thus, the finished product is the result of the various strategies followed by its producer, and the choices made at every stage of the process are the result of different circumstances and may be affected in different ways.

This method was first developed for Palaeolithic stone technologies, but recently it has been applied to analyze other technologies. Olivier Gosselain (2000) has made an excellent adaptation to explore social identities of potters. According to him, most technical options related to different stages of the manufacturing process of pottery are functionally equivalent; that is, they allow potters to achieve similar goals (Gosselain 2000:190). He suggests that the various steps of the sequence of pottery-making involve different processes of social interaction, reflecting various networks and strategies of the potters. Choices made at every step of the sequence are influenced by their degree of visibility in the community. Thus, each component of the *chaîne opératoire* has its own dynamic of change and continuity. For example, the method of forming vessels is generally very conservative as it involves motor skills and specialized gestures rooted in potters and is usually learned during childhood. This part of the process is normally not visible in finished pots, thus its selection should not be influenced by social pressure. In contrast, potters change more often their choices on clay selection, extraction, processing and firing. Gosselain argues (2000:192) that these stages reflect their interaction network. For example, a potter obtains clay from a particular source because it is in the property of relatives, or gains access to a certain kiln due to personal contacts. As a rule these production steps do not leave marks on the finished pots; for this reason, they can be easily modified without much influence of social pressure. In addition, potters make decisions about the vessel shape, surface finishing and decoration. These aspects are very visible on the pot, and openly show

potters' behavior; therefore, they can be simply and often modified, and may reflect prevalent social preferences.

The method of forming pots is generally viewed as very conservative. For Sander van der Leeuw (1993:241, 256), the technique that craftsmen follow for forming is neither determined by the existent raw materials nor by tools, but rather by the conceptualization that artisans have of their own pottery technology. That is, what potters consider as essential characteristics of their pots, and how they think pots should be done. For van der Leeuw (1993:257) the idea that potters have about their technology is composed of three fundamental aspects: (a) the topology, which the potter brings to bear on his dealing with shapes, for example, if potters see their pots as horizontal, vertical or as a transformation of a sphere; (b) the partonomy, which the potter applies to the shape, for example, what are considered the basic entities of which the pot is made such as a number of coils, or two or more pot segments, and (c) the sequence in which the vessel is made, for example, from bottom to top or vice versa. Thus topology, partonomy and sequence are fundamental elements of any pottery tradition since, according to van der Leeuw (1993:259), they underlie the ways in which a particular culture deals with the problems which it encounters in the material world. He believes that these three aspects are resistant to change because they permeate very large areas of activity of a group of people, they are shared, and people are largely unaware of their existence. Thus, the method of forming tends to be resistant to new ideas, technologies and consumers.

The sum of the choices that a potter makes in every step of the sequence of manufacturing results in the style of a pot. In my opinion style should embrace far more than the decoration of objects. It should include the preferences for certain raw materials, manufacturing methods, firing, etc., as Wobst (1999) suggested. If style is viewed only as the decorative part of an artifact it has the risk of being reduced to aesthetic taste. For this reason, Heather Lechtman (1977:4) introduced the concept of technological style to refer to the style of the process of manufacture. However, a distinction between 'style' and 'technological style' is difficult to establish as the difference between ornamental and functional features of an artifact is ambiguous and culturally determined. In addition, all the choices that potters make from a variety of possibilities during the process of manufacturing are active efforts, even when potters decide to conserve, without change,

earlier methods or elements or when choices are limited by habits, social pressure or environmental restrictions.

Conservatism of potters

It is paradoxical that archeologists often use ceramics to explore social change while at the same time it is generally assumed that potters are traditionalist and conservative. An early promoter of the idea that potters are conservative was George Foster, an authority of pottery studies in Mesoamerica. For him present-day potters from Tzintzuntzan in western Mexico were evidently conservative (Foster 1967). Although he found that in that town some potters were innovators, he observed that they were relative newcomers who had lived there only for one or two generations. He supposed that they were not acquainted with the norms of the community, and therefore were not restricted by them (Foster 1967:293-310). In his opinion, the conservatism of potters was inherent to a production process that encouraged caution. Also May Díaz (1966:17, 138) in her study of contemporary pottery from Tonalá, found that potters resisted technical innovation, even when there were economic and market stimuli. She believed that potters made any clay object which could be made by the molding methods they were accustomed to and by using their usual type of kiln, but nothing more. Thus, new pottery types could be made to satisfy demand, but the technology of production remained stable. She argued that the reason for this conservatism was that pottery was produced in family workshops in which the strong influence of the family head and a three-generation structure of knowledge transmission favored traditionalism.

There have been, however, other studies that do not support such conservatism. In the same manner as Foster and Díaz, several researchers have registered in detail potters' life and technology, but have found lively dynamics of change. It is remarkable that studies supporting potters' conservatism in Mexico were done in the 1960s. In contrast, research done in the 1970s and later suggests that such conservatism was only associated to a few parts of the production process while other parts were marked by creativity and innovation. Roberta Katz (1977), for example, done after Díaz another study of the pottery of Tonalá but she found a different situation. She observed that since 1959 the greatly increased demand for Tonalá ware in

diverse Mexican markets motivated potters to seek means for making their production more efficient. As a result, pottery technology in the town changed in several phases of the manufacturing process. In particular, potters acquired ready-ground clay, preferred vertical-halves molds to mushroom molds, and were building bigger and stronger kilns than before (Katz 1977:164).

Beate Engelbrecht (1987) found a similar situation among the potters from Patamban and Tzintzuntzan in West Mexico. She observed that potters experimented with new techniques to adapt to the changing market needs, without strongly changing the style of their pottery. She saw that the variation in vessel shapes and decoration increased a lot in the 1970s and 1980s because consumers from the city increased. She recognized, however, that old manufacturing techniques were conserved. Thus she concluded that pottery was a craft characterized by flexibility and adaptation capacity (Engelbrecht 1987:195, 364). From 1965 to 1997 Dean Arnold studied the manufacture of pottery in Ticul, Yucatan, and he arrived at similar results. During his long-term study he observed that changes in pottery distribution, vessel shape and decoration were relatively quick whereas clay sources and composition and technology of production changed more slowly (Arnold 2008:313-326). He believes that potters were able to adapt to social changes in Yucatan, such as modernization and the enormous development of the tourism industry, because they have a diversity of fabrication techniques, decoration, clay recipes and vessel shapes. They, however, maintained part of their traditional techniques because pottery production is household-based and knowledge transmission is kin-based. According to Arnold (2008:313) the diversity of fabrication techniques has been one of the main reasons for the survival of ceramic-making in that town, as potters can choose the most convenient techniques to adapt to changing demand. In my opinion, however, this does not mean that potters may use indistinctly several fabrication techniques. Rather, as his accounts suggest, potters know several manufacturing techniques as is the case of many potters in Mexico, but they maintain the same technique to produce the same kind of pots.

Also Dick Papousek (1981, 1984) studied three pottery-making towns in the State of Mexico—San Juanico, Santa María Canchesdá and Santiago Cochochitlán—and found that from the 1950s till the 1980s important changes in pottery-making were occurring. He observed that those changes concerned the production process rather

than the production methods, the distribution rather than the production, as well as the quantity rather than the quality of the products (Papousek 1981:52). Besides, he recognized that during the 1970s there was rapid modernization in pottery production, although he also acknowledged that there were some conservative potters (Papousek 1981:129-131, 1984:478). For him, the desire to change in these towns arose from previous necessity. This necessity was motivated by internal demographic pressure and by ecological problems, in particular, scarcity of firewood. Louana Lackey (1981) observed as well an impulse of innovation and change in the pottery town of Acatlán between 1974 and 1977. After the decline in demand for traditional wares, potters decided to create new kinds of vessels and designs for tourists, although the methods of manufacture remained the same. They increased the variety of their products, gave special attention to artistic and imaginative vessels, and as the roads and means of communication were improved in the region, they could sell their products in many other places. Thus by concentrating on a new type of market, tourism, the ceramic industry acquired a new impetus.

In a similar manner, Keith Nicklin (1971), after an exhaustive review of the literature on pottery technology worldwide, concluded that pottery-making was not inherently conservative. Stability in raw materials, techniques and forms are provoked by static economic and social conditions. Changes in these conditions often give rise to changes in such aspects of pottery manufacture. Therefore, it is possible that the potters' apparent conservatism found by researchers prior to the 1970s in Mexico was associated to the general static situation of the peasant society at that time. During the 1970s, in contrast, a wide and generalized modernization trend began in Mexico related to high population growth, industrialization and mobility from rural to urban centers. Also traditional crafts such as pottery were stimulated by national programs of development. Likely this trend also had effects on potters' lives and their manufacturing technologies in different regions of the country. We will explore this later in more detail.

Thus, it seems that potters in general are conservative in certain aspects of the manufacturing process but innovative in others. The conservative reproduction of culture as well as innovation and experimentation are usually related to the existing social conditions. In addition, every pottery community has a particular historical and social context, and for this reason, generalizations on the direction of pottery change and its relation to social change cannot be made.

Furthermore, in Mexico potters are usually peasants. They combine pottery-making with agricultural work, and for this reason their way of life is similar to that of millions of Mexican peasants. That is, potters' access to resources and to social welfare such as medical services, school and social security, has been similar and has followed similar trends to that of peasants. In the last three decades, however, in several towns close to urban centers pottery-making has become a specialized industry, as we will explore later. Families of potters have dedicated themselves completely to pottery manufacturing, and therefore, parts of the process of ceramic-making have been altered, and their way of life has to some extent been distanced from that of peasants.

Change and continuity in pottery-making

As this study involves analysis of the processes of change and continuity in ceramics during a long span of time, it requires considering archeological ceramic remains as well as present-day ceramics. As commented above, change and continuity can be more adequately understood when several stages of the manufacturing sequence are studied rather than focusing only on vessel shape and decoration, as has often been the case. This is feasible in the case of present-day ceramics; however, archeological remains offer often only fragmentary insights on some of the manufacturing steps. Many aspects of ancient processes of manufacture cannot be reconstructed; however, detailed low-tech observation permits us to gain important insights. For example, archeological ceramic fragments can provide information on clay selection and preparation, forming method, firing, shape, surface finishing and decoration. Technological methods of observation such as petrography or neutron activation analysis help to refine macroscopic observation; for example, they are particularly useful to identify clay provenance, as they permit us to identify in detail the mineralogical and the chemical composition of ceramics. These methods, however, do not help us to recognize many other aspects of the process of manufacture as normally the first steps of production are covered by later steps, and different procedures may leave similar marks on pottery.

Observation of sherds permits us to identify to some extent clay recipes used by potters, and if inclusions were added to improve clay

quality or if in a particular community recipes were standardized. Observation also permits us to recognize the method of forming vessels. Typical forming techniques in pre-Hispanic and contemporary Mesoamerica are: (a) molding, that is pressing plastic clay into or over a mold which is made from clay and fired or from gypsum for durability; (b) coiling, that is building up a vessel with rolls or coils of clay of uniform thickness, and (c) pinching, that is squeezing clay between the fingers in order to build up walls (Rye 1981:67-81). Frequently vessels are formed by a combination of these methods. Marks on the vessel surface permit us to recognize to some extent the forming methods, as well as the type and quantity of molds used and the sequence of forming. In addition, observation permits us to obtain a few data on firing techniques. For example, pots fired in an oxidizing atmosphere, that is, with excess of oxygen, have an orange color; while pots fired in a reduced atmosphere, that is, with excess of carbon monoxide as a result of insufficient air during firing, have a gray color (Rye 1981:96). Also firing clouds on the vessel surface give some indication if open firing or a kiln was used and if firing was carefully controlled or not. Observation of sherds also permits us to reconstruct the shape and size of the vessel, and if form and size standardization were important in a pottery community. Furthermore observation permits us to recognize to some extent the methods of surface finishing, for example, if vessels were smoothed, polished or burnished, or if a glaze coating was applied. The methods and motifs of decoration can be reconstructed when fragments are big enough to give an impression of the vessel's decorative plan.

Studies of archeological ceramics have usually focused on the morphology and decoration of vessels. These aspects of the process of manufacturing easily change and openly reflect potters' preferences and social pressure. Therefore they permit us to recognize material change, in particular shifts in vessels' appearance and trends of decoration. This focus, however, does not help to give a wide perspective on change and continuity, as it does not consider those aspects of ceramic-making resistant to change or with a slow rate of modification such as the forming methods. An integral study of several steps of the process of manufacturing offers insights on the dynamics of change, but also on the dynamics of continuity.

Summary

In the social sciences there have been several perspectives on the relationship between material culture and social change. In this study the view is preferred in which objects are not only considered a reflection of social life but also active constituents of it. This is particularly evident in colonial situations as many pre-colonial objects acquire different roles in the new colonial society and are able to motivate certain social relations. For example, simple indigenous objects that in pre-colonial times in Mesoamerica were commodities may be turned into valuables in the colonial society, and in that way they could motivate in producers and users a variety of new responses. Change in material culture, however, does not correlate directly to social change. Material culture has various dimensions of change, and they are related in complex ways to social change. In addition, change and continuity are not polar oppositions but intrinsically complementary. A means that permits us to recognize different aspects of change and continuity of material culture, in this case ceramics, is the study of the several stages of the process of manufacturing. Examples from many parts of the world show that parts of the process of manufacture are very conservative, such as the forming technique, while others easily change such as decoration. When the whole process is studied in detail the supposed conservatism of potters cannot be supported; craftspeople are traditionalists in some aspects but creative and innovative in many others.

CHAPTER THREE

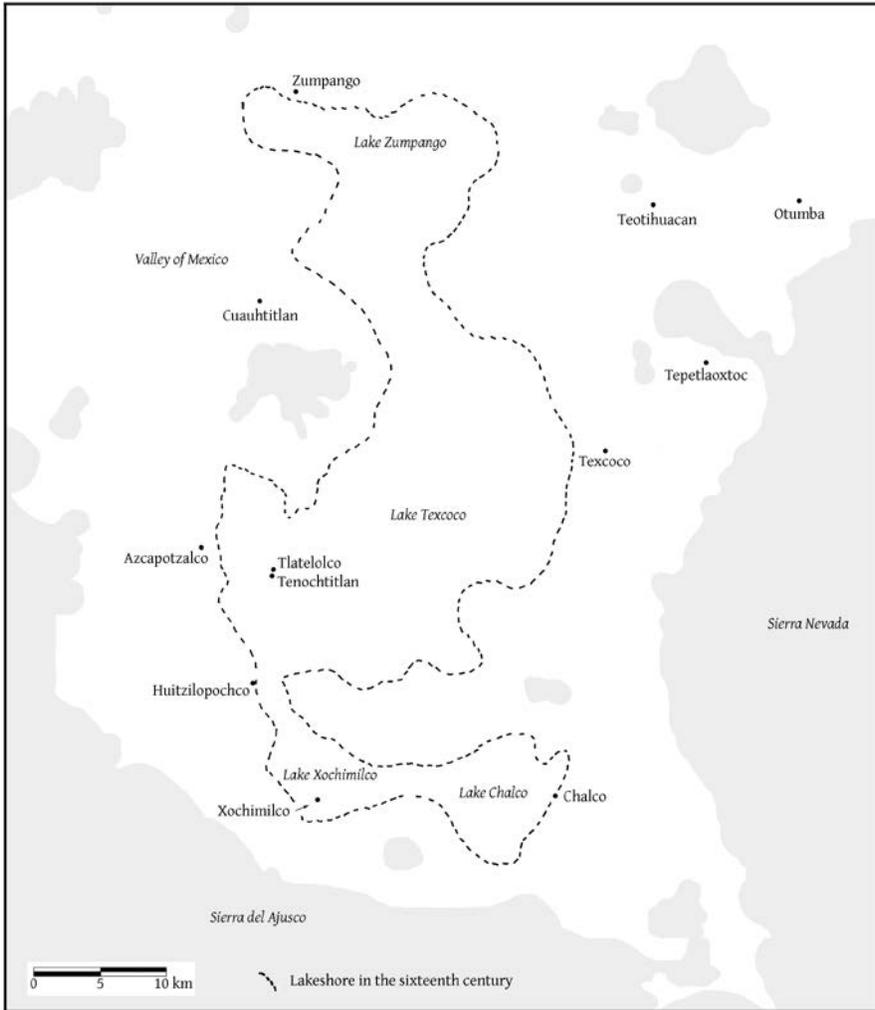
CERAMIC-MAKING BEFORE THE CONQUEST

At the time of the Spanish arrival the central Mexican ceramic industry was flourishing, and was the outcome of several cultural and technological changes that occurred during the last pre-colonial centuries. This late period, the so-called Postclassic (AD 900-1521), is today considered a time of high mobility, preceded by an early episode of political and cultural balkanization after the collapse of the powerful city of Teotihuacan (Epiclassic ca. AD 700-900). In the Postclassic we recognize two episodes of economic and cultural integration of large areas of Mesoamerica, the Toltec (Early Postclassic ca. AD 900-1150) and Aztec epochs (Late Postclassic ca. AD 1350-1521), separated by a period of migrations from northern Mexico (Middle Postclassic ca. AD 1150-1350) (Smith 2001a, 2001b; Smith and Berdan 2003). These historical processes had an impact on several aspects of life but also on the ceramic craft, as we will see in this chapter. Throughout this period ceramic objects show a variety of decorative styles suggesting different social and economic spheres of influence at the regional level (see e.g., Cervantes *et al.* 2007; Cobean 1990; García Cook and Merino 1988; Hodge and Minc 1990; Lind 1994; Noguera 1954; Smith 2007; Whalen and Parsons 1982). For example, Aztec decorative styles had variable presence in central Mexico due to the variable political and economic relations of the Aztec empire with other centers (see Smith 1990). Also, during this late period ceramics had a wide variety of uses. Everywhere in domestic environments they were for cooking, storing, transporting and serving, but in particular contexts they also played a major role in ritual activities as offerings, ritual equipment, means of writing, and even as divine objects. For example, in the last two centuries before the conquest in some places potters began to manufacture fine objects with complex pictographic decoration to be used as serving ware in ritual feasts (see Hernández 2005, 2010). In spite of the high variability in decoration and use of ceramics, some parts of their process of manufacturing remained without change, such as the method of forming, as we will see later; evidencing that ceramic-mak-

ing was involved simultaneously in various dynamics of change and continuity.

After the collapse of Teotihuacan (Map 2) around the seventh century began a period of conflict and migrations of people throughout Mesoamerica; new towns were founded and even political systems were modified (see Davies 1980; Smith and Berdan 2003). This process had an important impact on many aspects of culture; also on the ceramic industry. We recognize new decorative styles and vessel shapes and the modification and extension of distribution networks. For example, as George Cowgill (2001:730) explains, the fall of Teotihuacan was accompanied by rejection of many of its distinguishing ceramic shapes and decorations in the valley of Mexico. According to him, not only fine and public objects changed in the region, but also jars and other cooking and storage vessels used at home later assumed quite different shapes. Also *comales*, griddles for making *tortillas* well-known in other regions of Mesoamerica, began to be made for the first time in the valley of Mexico (see Sanders *et al.* 1979:451-474), suggesting new eating habits and possibilities for food preservation. We also identify that routes of distribution of ceramics were modified after the trade relations of that city were broken. For example, the trade corridor in Tlaxcala that according to Ángel García Cook (1981:269) communicated Teotihuacan with eastern Mesoamerica was closed. Such modifications in the ceramic craft were, however, not new in Mesoamerica. Earlier historical processes that we today identify as major political shifts were also associated to modifications in material culture. For example, Teotihuacan's power in the fourth century was accompanied by new vessel shapes and decorations in many regions of Mesoamerica (e.g., in the valley of Mexico see: Sanders *et al.* 1979; in Cholula: Noguera 1954; in the region of Tlaxcala: García Cook and Merino 1988; in the valley of Oaxaca: Caso *et al.* 1967).

Later historical processes also had effects on central Mexican ceramics. The rise of the city of Tula (AD 900-1200 according to Mastache and Cobean 2001:759) that coincides with increasing inter-regional trade throughout Mesoamerica (Smith 2001b:249), was accompanied by wide circulation of ceramics that we today associate with the 'Toltec' world although they were not manufactured in the city. This was the case of the so-called Plumbate wares, fine ceramic vessels with glossy appearance produced in the Xoconochco region of Chiapas (Neff and Bishop 1988), which were abundant at Tula (Mastache and Cobean 2001:761; Smith 2001b:250). Also in different



Map 2. The valley of Mexico showing the places mentioned in the text.

regions of central Mexico were produced similar quotidian wares, suggesting that the communication between regions also had effects on the manufacture of common pottery. For example, the so-called Mazapa ceramic complex, produced in Tula between AD 1000-1200 according to Cobean (1990:274), was similar to the Aztec I complex in the valley of Mexico dated to AD 1150-1300 (Cervantes *et al.* 2007:282-289), and to the Early Postclassic wares in Cholula in the valley of Puebla-Tlaxcala dated to ca. AD 950-1150 (Lind 1994; McCafferty 1994, 2001). The later development of the Aztec culture was related to new decorative styles and vessel shapes in the valley of Mexico (see Cervantes *et al.* 2007; Hodge and Minc 1990; Vega 1975). The Aztec empire had an important impact in neighboring areas; however local ceramic-making was little influenced. For example, the valley of Morelos, south of the valley of Mexico, was dominated by the empire in the first half of the fifteenth century; the valley of Toluca, west of the valley, late in the same century (Hassig 1988). Although Aztec ceramics were traded and used in those regions, potters continued producing their own local styles (see Chacón *et al.* 2007:203-209; García Payón 1941; Smith 2001c, 2007). In contrast, the city of Cholula in the valley of Puebla and many settlements of the valley of Tlaxcala, east of the valley of Mexico, maintained their political independence; traders did not exchange Aztec wares, local potters did not imitate them either (see Lind 1994; Müller 1978; Noguera 1954).

Despite regional variation, on the eve of the conquest potters from central Mexico had similar preferences for decorative styles and vessel shapes. For example, most vessels were decorated with painting; in contrast to earlier times such as the Teotihuacan period, when potters usually decorated with incisions (see Rattray 2001). Also bowls often had large conical supports; in Teotihuacan, in contrast, vessels generally did not have supports (see Rattray 2001). Not only were decoration and vessel shapes widely shared in many regions, probably the organization of production and the process of manufacturing were also similar. The problem here is that we know much less about those less visible aspects of ancient ceramic-making, as many of them did not leave recognizable marks on the finished products, also the extant documentary sources rarely provide data. In addition, our present knowledge of ceramic industries at that time in the various regions of central Mexico is quite dissimilar. While the valley of Mexico has been well studied, other regions, such as the valley of Toluca, have been scarcely explored.

Sources to study late pre-colonial ceramics

No other region and pre-colonial period of central Mexico has been so extensively studied as the valley of Mexico during the Late Post-classic. In particular Aztec culture has received a lot of attention. Pre-Hispanic and colonial documents and archeological research have given insights on its history, social organization and material culture, especially at the time of the Spanish arrival. For other regions of central Mexico documentary information is scarce and archeological research has been concentrated only on particular settlements. The same applies for our present knowledge on ceramic-making; the majority of the archeological research and documentary information is concentrated on the valley.

The few extant pre-Hispanic documents from central Mexico offer very little information on ceramic-making as they were made for mantic and ritual purposes. Still, in those painted books several ceramic vessels are represented as offering containers, and this gives insight on the kind of objects that were used in those contexts at the time the books were painted, or at earlier times, if they were copies of former documents. Also colonial documents offer few data on pre-colonial ceramic-making, as most of the scarce information on this topic refers to the situation after the conquest. For example, the only known document dealing in particular with ceramics, the *Códice de los Alfareros de Cuauhtitlan*, a piece of account and claiming of potters from that town made around 1564, alludes to events at that time. Although this manuscript was written only four decades after the conquest, several of the vessels depicted show clear Spanish influence. In addition, Fray Bernardino de Sahagún in his description of pre-Hispanic professions provides only a few brief general observations about potters.

Thus, our present understanding of the ceramic craft in the valley of Mexico and neighboring valleys has mainly been derived from archeological research. Material evidences of workshops in the region are to date scarce, however. In Tula, north-east of the valley of Mexico, have been excavated remains of a city's neighborhood dedicated to ceramic manufacture, used at least during the period of florescence of that metropolis (AD 950-1150) (Hernández *et al.* 1999). In other regions of central Mexico, however, finds are reduced to a few scattered molds, manufacturing errors and raw clay, which do not permit

the reconstruction in detail of the process of production or the spatial distribution of workshops (e.g., in Otumba in the valley of Mexico: Charlton *et al.* 1992:106; in Ocotelulco, Tlaxcala: Contreras 1994:23; in Yautepec, Morelos: Smith 2006b, Ch.E1:6). For those reasons archaeological investigation has concentrated on ceramic remains. Major sources of information have been several projects of surface survey that covered most of the valley of Mexico. This region is particularly suitable for ceramic studies as it is well circumscribed and not too large. Projects of extensive surface survey conducted during the 1960s and 1970s were able to recover quite systematically large collections of ceramics, which are by now extensively and intensively studied (Blanton and Parsons 1971; Parsons *et al.* 2008; Parsons *et al.* 1982; Sanders *et al.* 1970, 1979). Thanks to that research, we have at present a good knowledge of clay composition, manufacturing techniques, shapes and decoration of late pre-conquest ceramics of the valley of Mexico (e.g., Charlton *et al.* 2008; Minc *et al.* 1994; Whalen and Parsons 1982). Also chemical studies for identifying clay composition, such as neutron activation analysis, have been able to recognize the provenance of some ceramics, and therefore to trace their exchange within the valley. This kind of study has proliferated in the last years, and for this reason, at present our knowledge of the ceramics of that region has a strong emphasis on aspects such as distribution, trade and market systems (e.g., Charlton *et al.* 2008; Garraty 2006a, 2006b; Hodge and Minc 1990; Hodge *et al.* 1992; Minc *et al.* 1994; Nichols *et al.* 2002). In addition, rescue excavations in Mexico City and its surroundings have recovered large collections of ceramic fragments from a variety of contexts (e.g., Cervantes and Fournier 1995; Cervantes *et al.* 2007; González 1988; Matos Moctezuma 1982; Noguera 1934, 1969; Parsons 1966; Sejourne 1970, 1983; Vega 1975). Although these samples are often highly mixed due to continuous building activity in the city, they provide useful information on shapes, decorative styles and methods of manufacture.

In other regions of central Mexico ceramics have not been so intensively studied as in the valley of Mexico. Also scarce technological analysis of ceramics has been conducted, and for this reason, their distribution is less known. In the Puebla-Tlaxcala valley investigation of late pre-Hispanic ceramics has concentrated on the city of Cholula, in particular on its decorated ceramics (Hernández 2005; Lind 1994; McCafferty 2001; Müller 1978; Noguera 1954). In that place were pro-

duced, among a variety of plain and decorated ceramics, fine painted vessels with pictographic writing, which according to previous studies were made to be used in ritual contexts (Hernández 2005; Lind 1994; Nicholson 1982:243; Noguera 1954:141). Late pre-Hispanic ceramics from other parts of the Puebla-Tlaxcala valley are less known (e.g., in the region of Tlaxcala: Castillo 2007; García Cook and Merino 1988; in the region of Huejotzingo: Schmidt 1975).

In the valley of Morelos archeological late pre-Hispanic ceramics from several settlements such as Teopanzolco, Xochicalco and Guapulita have been studied in some detail (Angulo and Arana 1989; Hirth and Cyphers 1988; Vaillant and Vaillant 1934). More attention has been given to remains excavated in domestic contexts of a rural settlement, Yautepec, in which local ceramics as well as importations from the valley of Mexico appear (Smith 2006b, 2007; Smith and Doershuk 1991). In the valley of Toluca little systematic research has been done so far (e.g., García Payón 1941; Smith 2001c; Vargas 1975), therefore ceramics from the last centuries before the conquest remain poorly understood. Thus considering the extant ceramic collections, documentary information and previous research from the several regions of central Mexico, this view of the late pre-Hispanic ceramic industry gives more attention to the valley of Mexico. Data from the valleys of Puebla-Tlaxcala, Morelos and Toluca help to complement, or contrast, the situation in the valley.

Organization of ceramic production

The archeological excavations at Tula (Hernández *et al.* 1999) have revealed a city's neighborhood which was specialized in the manufacture of pottery during its period of florescence (AD 950-1150). Several houses of that area were also pottery workshops, as there have been found kilns, open firing places, tools, molds and production waste. This shows that pottery-making was a domestic and family-based industry, and that it was concentrated in one sector of the city; both patterns still common today in Mesoamerica. Sahagún's (1992, IX, Ch. 18-19:517-519) accounts on craftspeople suggest that in pre-colonial times some industries were highly organized; that is, members of a profession had a particular patron god, festivities and rituals, and even lived in the same neighborhood. This was for example the case

for feather workers. Although he did not mention if this was also the rule for more common occupations, the concentration of pottery workshops in particular sectors of Tula might be an indication of that.

In the valley of Mexico the lake environment is ideal for ceramic-making. Clay deposits suitable for manufacturing are widespread and distributed more or less regularly (Nichols *et al.* 2002:31). Thus during late pre-conquest times several towns were specialized in this activity. According to Charles Gibson (1964:350), colonial documents¹ indicate that this industry was important in Huitzilopochco, Azcapotzalco, Xochimilco and Cuauhtitlan, the latter being the major production center in the valley. There were also other settlements specialized in ceramics, although at present they are not identified. That is, studies of the composition of late pre-colonial vessels' clay, such as neutron activation and petrographic analysis, have recognized several major clay composition groups proceeding from different areas around the lakes (Chalco, Texcoco, Teotihuacan Valley, Cuauhtitlan Tenochtitlan, Xochimilco and Tepetlaotoc), indicating that ceramics were manufactured at least in those regions (Garraty 2006a:111; Hodge *et al.* 1992, 1993; Minc *et al.* 1994; Neff *et al.* 2000; Nichols *et al.* 2002). Fine variations in vessels' clay suggest in addition the existence of several places of production within those regions, although they have not been located yet. Studies of the composition of vessel clay (Garraty 2006a:175,193-194) also show that in the last years before the conquest settlements in the lakeshore near Tenochtitlan became the strongest producers of decorated and plain ceramics in the valley. Probable reasons were the need to supply a large urban population, the proximity to the market of Tlatelolco that was the biggest in the region, and the interest to make profit in the regional exchange controlled by the Aztec empire.

For the neighboring regions of the valley of Mexico there is little information on places of ceramic manufacture. It can be supposed that in every region during late pre-Hispanic times there were several locations of production as quotidian vessels were normally not transported long distances in pre-Hispanic Mesoamerica. In the valley of Puebla-Tlaxcala there were potters in Cholula as Díaz del Castillo (1980:149) wrote that "hacen en ella muy buena loza de barro, colorado y blanco, de diversas pinturas, y se abastece de ella México y

¹ Gibson (1964:350, 568) obtained this information from documents in AGN Tributos and BNM Ms. No. 455.

todas las provincias comarcanas”.² This city was not only an important regional pilgrimage focus at that time but also a large commercial center, as is clearly stated in the chronicles of the first Spaniards who were there, such as Bernal Díaz del Castillo (1980:149, 150) and Gabriel de Rojas (1985:132), *corregidor* of the city in 1581. Other lines of evidence also confirm that Cholula was specialized in ceramic-making. Compositional analysis of fine polychrome vessels from several places in the valley of Puebla-Tlaxcala show that they were made in that city, though there were also other centers of production in the vicinity of Huejotzingo and in Ocotelulco (Neff *et al.* 1994). In addition, the high variability in decorative styles and shapes of common ceramics from other places in the valley also suggests the existence of many places of production (see Castillo 2007). In the valley of Morelos compositional analysis of ceramics from Yau-tepec shows that most of these materials were made in the surrounding region although there were also ceramics produced in other areas in Morelos and in the valley of Mexico (Smith *et al.* 2006).

Several stages of the pre-colonial process of ceramic-making in central Mexico can be reconstructed from visible manufacturing traces on the vessels and from extant documents. Those sources of information, however, do not shed light on other parts of the process of manufacturing, such as the methods for clay procuring, drying and storing vessels. In view of this, six stages of the process of ceramic-making will be broached here: (a) clay preparation; (b) vessel forming; (c) vessel surface finishing; (d) firing; (e) decoration, and (f) assembling vessel shapes.

(a) *Clay preparation*

Essential for potters is that the clay for making ceramics is workable. This means that the blend of clay minerals and non-plastic particles, naturally present or added by the potter, must be suitable for forming vessels; to be precise, the clay should be plastic enough to acquire the form given by the potter but not too plastic as it has to retain the new shape (Rye 1981:31). For this purpose the clay can be prepared in different ways; potters may add non-plastic inclusions such as sand, organic materials, crushed sherds, or they may mix clays of different

² They make there very good pottery wares, red and white ones, with a variety of paintings, and they are supplied to Mexico and all neighbourhoud provinces (Díaz del Castillo 1980:149, my translation).

properties. In addition, the actions involved in the preparation of clay can be different; potters may crush clay clods with their feet, or may grind them with a stone or in a mill, also the clay mixed with water may be used immediately or may be stored for a long period (see Rice 1987:115-124; Rye 1981:29-39). Clay recipes depend, in part, on the characteristics of the available clay in a particular geological region, but they also result from cultural preferences of the potters in the manners to deal with their natural environment. Clay recipes are learned, and as a rule they are transmitted for generations, however, they may be replaced or modified after being learned. As Gosselain (2000:192) explains, relatives, neighbors or users are normally not involved in this technical, and not visible, aspect of ceramic-making, but fellow potters may give advice and new ideas for clay processing. However, it is difficult to identify in detail clay recipes and preparation from ancient ceramic remains alone as different activities may leave similar marks on sherds and some activities do not even leave perceptible marks (see Rye 1981).

At present we have little information on clay preparation during late pre-colonial times in central Mexico. Observation of diverse kinds of ceramics from different places in the valley of Mexico shows that the clay used is similar, as clay deposits in this lake region have the same origin and composition. At that time this resource was not scarce, since we can see at present that clay deposits are widespread in the area and close to the surface. This may suggest that access and control of clay sources was not a main issue in ceramic-making towns. The clay of vessels made in the valley regularly contains sand inclusions. Big and thick vessels, such as those for cooking, had a higher percentage of sand, around 20-40%; while smaller and thinner objects had around 5-15% (Blanton and Parsons 1971:294-309). Small and decorated vessels contain additionally small amounts of volcanic particles (pumice) (Blanton and Parsons 1971:304). This suggests that utilitarian ware (for cooking, storing and transporting) and serving ware (for eating) were made in general terms from the same clay, although for the first kind of vessels it was coarser, with larger and slightly more sand particles (Parsons *et al.* 2008:389). It seems that this was the most common clay recipe in the valley, even though it is not clear if sand and pumice were natural components of the clay, or if they were added by potters as temper. Such a recipe did not vary in significant terms during the last five centuries before the conquest as sherds corresponding to the Early Aztec period look similar to sherds

of the Late Aztec period. As an exception, there was a ware made using another clay recipe. Vessels for salt-making, which were rough, thick and low-fired, were made out of clay with abundant fibrous material added as temper (Blanton and Parsons 1971: 312-313; Charlton 1969). These objects were hastily made and very poorly fired as they were only molds for salt production. Under these labor-saving conditions, potters gave stability to the vessels by using extremely coarse clay and fibers.

Sahagún (1992, X, Chap. 22:571) in his account of a potter who sells *comales*, mentions that he "... moja muy bien la tierra y la soba y mézclala con el flojel de las espadañas, y así de ella, así beneficiada, hace comales ...".³ Later he says that also bowls, plates and all kinds of vessels were made using this prepared clay (Sahagún 1992, XI, Chap.12:702-703). At present potters of Metepec in the valley of Toluca also include reed spikes in the clay. Charlton and colleagues (2007:436, 440) briefly mention that in late pre-colonial rural contexts of the valley a small percentage of cooking and serving vessels include vegetal fibers in the clay. This tempering may be similar to the one described by Sahagún, however, other studies of pre-Hispanic ceramics from the valley have not recognized it (Cervantes *et al.* 2007; Whalen and Parsons 1982).

In the valley of Puebla-Tlaxcala we can recognize a little variation in clay recipes. In Cholula ceramics were made from yellowish clay blended with sand and, on occasion, also volcanic particles such as basalt. Petrographic studies suggest that all ceramics in the city were made using in general terms the same methods of processing as clay, inclusions and porosity are similar (Suárez 1994:50). Vessels for cooking and transporting, such as *ollas* and big bowls, and vessels for serving, such as simple decorated small bowls and fine painted bowls, were apparently made from similar clay, although small vessels often had fewer inclusions. As in the valley of Mexico, it seems that during the last five centuries before the conquest potters did not make significant changes in clay recipes. In other parts of the valley of Puebla-Tlaxcala potters used other kinds of clay. In the region of Tlaxcala, García Cook and Merino (1988) have identified that the clay of some late pre-colonial ceramics have inclusions of sand and other volcanic

³ "He moistens well the earth and kneads it and mixes it with reed spikes, and from it, so treated, he makes *comales*" (Sahagún 1992, X, Chap. 22:571, my translation).

ash. Also some vessels have a higher quantity of inclusions than others, and some have a compact structure while others are porous, although more study needs to be done in order to find if this variation is related to the shape of the vessel or to its provenance. The reason of this variability may be that Tlaxcala is a relatively large area with several types of clay deposits, though it may also be that potters of different towns had different preferences.

In the valley of Morelos late pre-colonial potters used similar clays but their recipes showed a large range of minor variations. This was evident in Yautepec, Cuexcomate and Copilco, where Michael Smith (2006a, Ch. B10; 2006b, Ch. C2,) conducted petrographic analysis of ceramics that showed that potters used similar clays but blended them with different minerals in different proportions. According to Smith, it seems that potters were relatively flexible in the manner of preparing their clay, as it was not possible to associate particular vessel clays with particular towns, or with particular kinds of objects. Also it seems that this pattern occurred at least during the last three centuries before the conquest. This variability reflects in part the geological unevenness of the region, which has several types of sedimentary and volcanic deposits, but it also shows that potters did not follow strict recipes but selected the materials they had available or considered more convenient, that is, potters adapted the knowledge transmitted for generations to their present situation.

(b) *Vessel forming*

There are different techniques for applying pressure to plastic clay to form vessels. Potters may use only one method, such as casting a vessel in a mold or throwing it on a potter's wheel, or they may combine various methods, for example, make part of the vessel by molding and the rest by applying coils of plastic clay. In some forming techniques potters perform several operations at different stages of the plastic range of the clay (Rye 1981:21). That is, a section of a vessel may be dried before the rest is made in order to avoid deformation, or the lower walls of vessels made by coiling require the use of softer clay. Also usually when the water content of the clay drops below the minimum for the plastic range (the stage known to potters as leather hard), handles or other additions are applied. Thus, this part of the process of ceramic manufacture involves not only motor habits mastered by frequent repetition, but also knowledge of the sequence of execution.

Both types of expertise are learnt by potters and transmitted across generations, and as Gosselain explains (2000), they are very resistant to change because they are internalized, not visible, and similar vessels can be shaped using other forming methods. The techniques used to form ancient ceramics can be identified from vessel remains alone, as they often leave clear marks on the finished products. For example, objects made by several molds have ridges left by the junctions between parts of molds, or vessels made using the potter's wheel have a series of throwing grooves left by the potter's fingers (Rye 1981:59). However, these marks are often covered by later processes of surface finishing such as painting or glazing. In addition, archeologists studying ceramics often do not describe those aspects, as they concentrate on the documentation of more visible aspects such as clay composition, vessel shape and decoration.

In central Mexico late pre-Hispanic vessels were made using a combination of molding and coiling techniques. Molding implies to press the clay into or over a mold, and coiling to use rolls or 'coils' to build up a vessel around a circumference in order to increase the height (Rye 1981:67, 81). In the valley of Mexico molds to form the body and neck of vessels were horizontal, that is, they served to create horizontal sections of the vessel. Such kinds of molds have been found in archeological contexts. For example, Charlton and colleagues (1992:106-107) excavated in pre-Hispanic contexts in Otumba external horizontal molds to make censers and spindle whorls. They have the shape of simple and complete bowls, with designs incised on the interior. When the clay was pressed in the interior, a raised decoration on the exterior surface of the new formed censer was created. Also in Tula were found horizontal molds for bowls and plates with low-relief incisions on the interior for producing vessels decorated with curvilinear motifs on their exterior walls (Hernández *et al.* 1999:77). In addition, archeological remains of pottery show that *ollas*, with or without high neck, were made using various horizontal molds. In fragments of *ollas* from the valley it can be recognized that their body was made from two separate hemispherical sections, which were attached leaving visible marks of the juncture around the middle inner part of the body.

According to visible marks on the vessels some aspects of the sequence of forming followed by potters of the valley can be reconstructed. In the case of *ollas*, it seems that a first step was to create the body out of two horizontal molds. Then (or in parallel) the neck was

created using another horizontal mold. Later these three vessel sections were attached, and afterwards the potter smoothed the vessel surface placing the pot on its base. The evidence is that as a rule the upper sections of the vessels are better burnished (Blanton and Parsons 1971:298), while the lower (and less accessible to the potter's hands) are less smoothed. Also the base is often rough and uneven. *Ollas* with high necks were made following a process a bit different. That is, necks were molded and smoothed separately in the hands of the artisan and were then attached to the vessel body. This can be seen in the fact that *olla* necks often have vertical burnishing marks (Blanton and Parsons 1971:304). Handles were modeled separately and after the vessel was dried for some time and burnished they were attached to the body.

Bowls with simple walls had an easier forming process. They were made with one horizontal mold, since no marks of junctures of separate mold sections have been detected on their bodies. After the vessel was formed, the potter commonly smoothed its surface placing it on its base. The evidence is again that upper sections of bowls are better burnished (Blanton and Parsons 1971:298). Supports for tripod vessels were made separately and then joined to the vessel's base. In Early Aztec times some supports of serving bowls were made with molds in order to have a stepped form, while in Late Aztec times most supports were just modeled in conical shape (Whalen and Parsons 1982:441, 450). These conical supports were burnished before they were attached to the vessels. This can be recognized in their vertical burnishing marks (it is difficult to burnish supports in vertical direction when they are already attached to the vessel). Censers were also made out of horizontal molds into which the clay was pressed, as the molds found by Charlton and colleagues (1992:106-107) in Otumba suggest. Their handles were modeled separately as well and then joined to the censer's body. The evidence from Otumba also suggests that some censers were hastily made. The handle was often placed over the molded design decoration (Charlton *et al.* 2008:247). Salt-making vessels were again exceptional in their manufacture. Their exterior has a rough texture that apparently resulted from fabric or basketry impressions on the wet clay surface (Blanton and Parsons 1971:312-313). As potters did not want to invest much time in these objects, they just formed them hastily without smoothing their surface, as was usual for other kinds of vessels.

It seems that in the valley of Mexico potters used similar techniques for vessel forming. Differences in this process were related to vessel shape (*ollas* were made out of more sections than bowls), rather than to vessel use (cooking pots were made in a similar way to serving pots). These techniques, in particular the use of molds, promoted standardization in shape and size. Nevertheless, archeologists have observed variation in this stage of manufacturing during the last five hundred years before the conquest. Garraty (2006a:199-203) and Whalen and Parsons (1982:450) have identified that ceramics for cooking and serving made before the rise of the Aztec empire presented some regional variation in shape and size, while ceramics made in the times of the empire were more uniform in their dimensions. They take this increase in standardization as a consequence of imperial control over ceramic production and distribution in the region.

In Cholula, in the valley of Puebla-Tlaxcala, vessels were also made using horizontal molds and coiling as forming marks on their surface suggest. *Ollas* were made using various horizontal molds. Goblets, vases and censers with pedestal base were made with two molds, one for the body and the other for the pedestal; both sections were joined after they acquired a leather hard consistence as marks on the vessels suggest. Bowls often have supports in the shape of eagles, jaguars or other animals; they were made by mold and applied to the leather hard vessel body. Censers also had handles and effigies of eagles, jaguars or *xolotl* faces made by mold and later applied to the vessel. It seems that during the five centuries before the conquest potters of that city used in general terms the same methods for forming vessels. In Ocotelulco bowls, plates, vases and goblets were made using horizontal molds as well; also supports and handles, in the same shapes as in Cholula, were made by mold and applied to some vessels, as ancient molds found in the town show (Contreras 1994:23). Thus, in late pre-colonial times in the areas of central Mexico where information is available the methods for forming vessels were in general terms similar and stable. This suggests that this kind of knowledge was transmitted without disruption across generations.

(c) *Vessel surface finishing*

Once a vessel is formed, but also during the process of forming, a potter generally finishes its surface by rubbing a tool against the leather hard clay or by applying a slip (fluid suspension of clay in water of dif-

ferent color than the vessel clay) to modify its texture and light reflecting qualities (Rye 1981:89). Some of these techniques are more successful when the vessel is leather hard while others require that the vessel is completely dry. Surface finishing requires particular motor habits, but also experience with clay properties. Both kinds of knowledge are learned and transmitted across generations. However, as this part of the process of ceramic-making is visible on the vessels it may be influenced by other potters and by users. The methods used to finish ancient ceramics can be identified by observing vessel remains, although normally earlier stages of this process are covered by later stages, leaving only the latter visible. Archeologists frequently create an artificial and sequential division between forming, surface finishing and decoration of vessels. However, for potters these processes can be part of a continuum, as they may be performed in parallel and on occasion cannot be distinguished, that is, surface finishing may be decoration, or forming may be decoration. In addition, often the perception that certain aspects of a vessel are decorative, but others are not, is not only culturally determined but also subjective. In this work this artificial division is maintained because it is believed that every one of these processes may be associated to particular ideas, preferences and influences of potters. Surface finishing refers here only to the modification of the surface's texture or the application of a slip, while decoration refers to the use of painting, cutting and joining techniques. In the section for surface finishing I give attention to the techniques used while in the section for decoration I concentrate on the motifs and meanings of the decoration. Potters may give variable attention to the finishing of the surface of a vessel. They may only smooth the surface, that is, rub the vessel until it acquires a regular texture but a matte appearance. They may burnish the surface, that is, rub the surface regularly but the tool is used directionally so that a pattern may be produced and the appearance is a combination of matte and luster. Or they may polish the vessel, that is, obtain a regular surface with uniform luster (Rye 1981:89-90).

The remains of pottery workshops in Tula show that potters used for polishing different kinds, shapes and sizes of stone and pieces of fired clay with a half moon shape (Hernández *et al.* 1999:76). We do not know, however, which kind of tools were used. Late pre-Hispanic potters of the valley of Mexico gave to common vessels, such as those for cooking, storage and transportation, a similar surface finishing that was simple and without extra decoration. The surface of this kind

of object shows the natural color of the fired clay, which is generally orange, light orange or orange-brown (Blanton and Parsons 1971:304). The surface is usually relatively well smoothed but hastily burnished, that is, strikes left by the burnishing tool can be seen (Blanton and Parsons 1971:304). As these marks show, vessels were frequently burnished in horizontal direction, somewhat irregularly. The incidence of a few vertical strikes shows, however, that on occasion potters burnished the vessels in vertical or irregular directions. Small vessels were better burnished than bigger ones (Blanton and Parsons 1971:304). In addition, *comales* were made with an extremely rough base in order to resist thermal shock. Their interior surface is, in contrast, like other cooking vessels, well smoothed and relatively well burnished. Potters also made simple vessels for serving, which had the same surface finishing as cooking implements and were as well not decorated. These vessels were often burnished in horizontal direction, although vertical and irregular burnishing also occurs (Blanton and Parsons 1971:304).

Potters also made serving vessels with painted decoration. These objects show more variety in surface finishing. The most frequent were orange bowls and plates with black painted decoration (archeologists name them today Black-on-Orange vessels) (Figure 1). These objects maintained the natural orange-brown color of the fired clay. They were on the interior and exterior well smoothed and hastily burnished so that strikes are clearly seen, and the final appearance was matte. Vessels were often burnished in horizontal direction, but some vertical and irregular marks suggest that they were also sporadically burnished in other directions. Conical supports of tripod vessels were burnished, but other kinds of supports, such as those molded in stepped shape, did not receive any kind of finishing (Whalen and Parsons 1982:441). Afterwards they were decorated with black designs. Potters also made serving vessels with red decoration; archeologists name them today Red Ware (Whalen and Parsons 1982:446) or Texcoco ware (Cervantes *et al.* 2007:279; Tolstoy 1958) (Figure 2). They were as a rule better finished than the vessels with black decoration. Their orange-brown surface was well smoothed and relatively well burnished, usually in horizontal direction as rubbing marks show. In sections of the surface potters applied a thick red paint, which was polished to reach a glossy finishing, often leaving horizontal rubbing marks (Whalen and Parsons 1982:446). Some of these vessels were additionally decorated with black or white paint, or with incisions. Potters also made other serving vessels with more complex decoration



Figure 1. Fragments of Late Aztec Black-on-Orange vessels from the valley of Mexico.



Figure 2. Fragments of late pre-Hispanic Red Wares from the valley of Mexico.

and higher quality. These objects were painted with red, orange and black designs in the same style as the famous late pre-Hispanic polychrome ceramics from Cholula (archeologists name the vessels of the valley of Mexico Chalco Polychromes). The orange-brown surface of the vessels was well smoothed, although most of it was covered with a thin white matte slip, which was used as background for the painted decoration. Subsequent to the painted decoration, potters polished the vessel surface to reach a glossy finishing, usually in horizontal direction (Whalen and Parsons 1982:441, 446). As most of these objects were open bowls and plates, they received more complex decoration and better polishing in the interior than on the exterior.

Potters also made censers, which had an orange-brown surface relatively well smoothed, sometimes with a fugitive white or cream matte slip (Parsons *et al.* 2008:406). These objects were decorated with several techniques, such as triangular perforations, raised decoration produced by mold, and occasionally red paint (Charlton *et al.* 2008:247). Potters produced as well vessels for salt-making. Their exterior surface had the natural orange-brown color of fired clay and was quite rough due to impressions of baskets and fabrics made when the clay was still wet (Blanton and Parsons 1971:312-313). The interior surface was better finished; the bottom was carefully smoothed while the upper part of the walls was only slightly planed by hand. During the five last centuries before the conquest potters from the valley did not notably modify the surface finishing of their ceramics. Although the decoration of vessels for serving had clear alterations, the methods for modifying the structure of their surface remained stable.

In Cholula pre-Hispanic potters also finished the surface of common vessels, such as those for cooking, storage and transportation, in a simple manner and without extra decoration. These objects show the natural orange-red color of the fired clay and are usually relatively well smoothed but hastily burnished as the strikes left by the rubbing tools suggest. Also as in the valley of Mexico, potters finished the surface of *comales* exposed to heat with a very coarse texture, although the inner surface was well burnished with strikes in several directions. They made as well common serving vessels with simple surface finishing and without decoration; however, in the last centuries before the conquest most of these kinds of objects were decorated with painting. They received a more complex treatment; first potters smoothed the vessel surface. The surface was then covered with thin matte white

slip, and it was covered with orange or white paint. On this background, potters painted black, red or orange decorative motifs. Afterwards, they polished the surface, and submitted it to firing, and the result was a polychrome vessel with a burnished although rather matte surface. In the last two centuries before the conquest potters continued producing this kind of vessel, although they modified to some extent the decoration. Also they created an assortment of vessels that were notably more elaborate than previously and contemporary ceramics. They were made following the same process as other painted vessels in Cholula but received a very lustrous surface finishing, so that they acquired a glossy appearance. In addition, their decoration was more complex and carefully made and included elements of the pictographic corpus of the pre-colonial books from central and southern Mexico (see Hernández 2005, 2010; Lind 1994). For this reason, archeologists call them today codex-style vessels (Figure 3). These kinds of objects were also made in other places of the valley of Puebla-Tlaxcala such as Ocotelulco (Contreras 1994) and Huejotzingo (Schmidt 1975), and were similar to the fine polychrome vessels made in the valley of Mexico.

Potters of the valley of Morelos finished the surface of quotidian vessels for cooking, storage and transportation in a simple manner as well. As the study of Smith (2006b, Ch.C2) shows, their orange surface was only smoothed and burnished. *Comales* were finished in the same way as in the valley of Mexico and Cholula. Some *ollas*, however, received a thin and fugitive white slip, and there were other examples with more complex decoration made with red, black and/or white painting. Bowls and other vessel shapes for serving were often decorated following the same trends as in other regions of central Mexico, that is, by using painting of several colors such as red, black, orange and white. The surface of these serving vessels was sometimes only burnished and sometimes polished. Vessels with red surface, and decorative motifs in black, white or orange, were quite abundant in Morelos. These techniques for finishing the surface were used during at least the last two centuries before the conquest.

In sum, potters in central Mexico finished their vessels in similar manner. They shared not only the methods of rubbing the surface but also the high attention given to the surface of some serving objects. That is, in every region there were repertoires of fine polished vessels with polychrome painted decoration. Surfaces were not decorated with vitreous glaze in pre-Hispanic Mesoamerica. Plumbate ware, a



Figure 3. Fine polychrome vessel with pictographic decoration from a burial in Cholula (Suárez 1989) deposited at INAH Puebla (photo by Sergio Suárez).

widespread trade pottery made in the Soconusco region on the coast of Guatemala during the tenth and eleventh centuries, has some similarity to glazed ceramics. These ceramics have a fine ferruginous slip, which after firing have an iridescent gray/orange color (Shepard 1948). Although this slip is vitrified in some places due to the particular mineralogical composition and firing, it is not a high-fired vitreous glaze (Rice 1987:20). This technology, however, did not continue in Mesoamerica after Toltec times.

(d) *Firing*

The main aim of firing is to subject vessels to sufficient heat for a long enough time to assure the permanent change of physical properties of clay. As the ceramist Owen Rye (1981:25) explains, depending on the composition of the clay, the minimum temperature varies between

500°C and 700°C. Potters should control during firing the rate of temperature, the maximum temperature and the atmosphere surrounding the objects. These aspects not only permit, or not, a successful firing, but also determine the hardness, porosity, stability and appearance of ceramics. For example, the atmosphere surrounding the objects during firing clearly influences the final products. An oxidizing atmosphere, that is, with excess of oxygen due to excess of air, produces vessels of orange and brown color. A reducing atmosphere, that is, with abundant carbon monoxide resulting from insufficient air, produces vessels of gray and black color. Potters can fire their vessels in open firing or in kilns. Although the first involves little or no building, it requires a high degree of skill and observation. As Rye shows (1981:25), the kiln does not always represent an advance over open firing, as some kilns do not permit a good control of temperature or may require more fuel as the structure must also be heated. Nevertheless, he adds, kilns with one chamber for fuel and another for vessels are more efficient than open firing, as they permit a better control of temperature and air circulation.

Thus, firing requires knowledge and experience, which can be learned and transmitted across generations, but also facilities (if a kiln is used) and fuel. The firing atmosphere is visible in the final products; however, other aspects of the method used for firing, such as the temperature and the kind of kiln or fuel used, are not visible. For this reason, users, relatives or neighbors are normally not involved in this part of the process of ceramic-making. However, as present-day potters explain, the method used may be modified or replaced as changes in control of heat, type of kiln or fuel may make the production more efficient, and here fellow potters may give advice and new ideas. Ceramic remains alone do not permit us to identify all conditions of ancient methods of firing. Areas or structures for firing and damaged vessels may provide information on the control of temperature but they are not always found in archeological contexts.

The firing technology in central Mexico during late pre-Hispanic times is poorly known given the scarcity of published information on ceramic workshops. Nevertheless, the partial excavation of several pottery workshops in Tula has given important information on this topic. In Tula potters used two-chamber updraft kilns (Hernández *et al.* 1999:73). That is, they constructed circular kilns (one excavated kiln had 116 cm diameter) with one lower chamber for fuel, separated from the upper chamber for the pots by a floor. The chamber was

more or less above the firebox, creating the effect of a chimney. Kiln walls were constructed with adobe and stones; both the firing and fuel chambers had a pottery pipe, probably for controlling the air flux during firing. This facility at Tula was similar in technology to the two-chamber kilns used at that time in Spain (Lister and Lister 1987:147), indicating that the firing technology on both sides of the Atlantic developed in a parallel way. The excavations in that area also revealed the existence of firing floors, which are evidence of open firing, and of pit kilns, which are shallow firing places (Hernández *et al.* 1999:73). The use of various firing technologies in that city suggests that pottery workshops had different levels of specialization and intensities of production, a common pattern in present-day pottery towns.

In the valley of Mexico ceramic remains suggest that potters fired their vessels in an oxidizing atmosphere, as usually their color ranges from orange to brown. Occasionally, remains of common vessels for cooking, transportation and storage show dark firing cores, that is, when the cross-section of a freshly broken sherd has a center distinct in color from the surface. This shows that this kind of vessel did not always receive sufficient heat for a long enough time, a condition typical of most unglazed ceramics everywhere (Rye 1981:115). Also potters did not always have good control of the firing process as these vessels often show firing clouds in the surface, which implies that they were in contact with fuel during firing and were not fired for enough time to permit the complete combustion of carbon. Wares for serving, both orange vessels without decoration and orange vessels with black decoration, sometimes have dark cores, but only occasionally firing clouds. The same is the case for orange vessels with polychrome decoration. These patterns could be the result of firing small serving vessels together with larger cooking vessels. That is, serving vessels might be grouped in the place of firing and then covered by the larger cooking vessels, as present-day potters often do. In this way serving objects received less heat but were not in contact with fuel while cooking objects received more heat but were exposed to fuel. In that case potters used the same firing method for all orange vessels.

Red wares, in contrast, were fired in fairly different conditions. These vessels have almost always a very distinctive dark firing core (Blanton and Parsons 1971:309). Often inner surfaces are blackened, which suggests they were fired upside-down. Also they have well-documented variations in the tone of the red painting; some are brightly red while others are quite dark or quite light (Cervantes and

Fournier 1995:101), which suggests temperature fluctuations. In addition, they are less hard than orange vessels. It seems that this ware was fired at lower temperatures and with less heat control than other wares. This might suggest that these wares were made in different workshops than orange wares, or at least fired separate from orange wares. Pots for salt-making also show a different firing process. They again evidence that they were hastily and cheaply made. They were low fired as they usually have a dark core, and even in a few cases all the cross-section of sherds is dark; also their texture is usually quite crumbly (Blanton and Parsons 1971:312-313). Ceramic remains suggest that during the five centuries before the conquest potters did not make significant changes in their firing technology. Orange and red wares as well as salt-making vessels do not evidence modifications in firing conditions.

In the Puebla-Tlaxcala valley potters also used kilns. Rafael Abascal (1975) reports that in an extensive surface survey in Tlaxcala were found several pits used as one-chamber kilns to fire pottery and shallow pit-kilns, which he assigned to different periods and settlements of the pre-Hispanic history of the region. In Cholula, late pre-conquest ceramic remains suggest a method of firing similar to that of the orange wares in the valley of Mexico. Also it seems that all potters of the city used in broad terms the same process to fire their vessels, as all sherds have similar color range, hardness and porosity. There were some variations between the wares for cooking, transportation and storage and the wares for serving. The first often have firing clouds, while the serving vessels do not have these clouds but present on occasion dark cores. As in the valley of Mexico, it shows that during firing it was important to protect serving vessels from fuel, while cooking vessels could be exposed to it. The fine polychrome wares evidence the same firing conditions as the other decorated serving vessels of the city. Thus ceramic remains indicate that potters used the same firing methods for all their vessels. Also we cannot recognize changes during the last five hundred years before the conquest.

In the region of Tlaxcala ceramic remains suggest that in broad terms potters used similar methods of firing as in the valley of Mexico and Cholula (Castillo 2007:118-123). In contrast, east of the valley of Puebla-Tlaxcala, in the Tehuacan valley, potters clearly used other firing methods. Many vessels are gray (Castillo 2007:142-146; MacNeish 1970), which indicates that they were fired in a reducing atmosphere. This could be a result of covering the vessels during firing so that air

could not circulate. In that region, however, not all vessels were gray; potters also produced orange vessels, the result of firing in an oxidizing atmosphere. In the valley of Oaxaca the technology of reducing firing was used since very early times (see Caso *et al.* 1967). Thus the Tehuacan valley was the area where the ceramic firing technologies of central Mexico and Oaxaca were in contact. In the valley of Morelos, ceramic remains also suggest firing methods similar to the valley of Mexico and the valley of Puebla-Tlaxcala. Fired vessels are also orange-brown, and sometimes have dark cores (Smith 2006b, Ch.C2). In this area potters also produced a red ware similar to that of the valley of Mexico, although it does not seem to be fired in different conditions from the orange ware, as it does not show a high incidence of dark cores and color variation in the surface as is the case of this kind of vessel in the valley of Mexico. In sum, potters of central Mexico fired their vessels using two-chamber kilns, pits, shallow pit kilns and open firing. The analogous visual appearance of finished vessels throughout central Mexico suggests that potters had similar technologies and preferences for firing during the last centuries before the conquest.

(e) *Decoration*

Decorative techniques for ceramics take into account the possibilities offered by the various properties of clay during the process of drying and the effects of firing. Knowledge related to these aspects can be learned and transmitted across generations. However, as this part of the process of ceramic-making is highly visible, potters may easily make changes influenced by users, relatives, neighbors or colleagues (see Gosselain 2000:191). Designs and patterns executed in a particular decoration technique may even be more easily modified as this does not require extra technical knowledge but only new ideas resulting from inspiration, imitation or reinterpretation. The techniques used for decorating ancient ceramics can be identified from vessel remains alone, but the meanings that ancient producers and users of vessels attributed to decorative motifs are difficult to recognize. On the one hand, decoration on ceramics is an index of preferences, influences and social context of potters and users. Archeologists may be able to have insights into these aspects by means of, for example, comparing large collections of ancient ceramics from different contexts and places. On the other hand, ancient decoration might also have a

particular intended meaning and a particular function, and this is more difficult to identify. The function of decoration on this media is culturally determined; for example, in some places decoration animates a vessel. This is the case of the present-day Maya Lacandon *läkil k'uh*, gods' dishes, small censers which are animated by means of its decoration (face and attributes of gods), prayers and offerings (McGee 1998:42-43). Also decoration might have an important role in ritual practice, as apparently was the case of the late pre-Hispanic fine polychrome serving wares from Cholula, which were decorated with well-known symbols of the Mesoamerican rituality (see Hernández 2005, 2010). Nevertheless, decoration might also be only a way to increase the object's aesthetic value. In addition, in a particular society not all decoration on ceramics has the same importance. Some vessels may be decorated with motifs that do not intend to convey deep meanings, while others may have motifs with complex and multilevel connotations. The latter may be the representation of something (a thing, an idea, an action) but this is not all. The object's makers and users might assign to the thing, idea or action represented particular meanings, which might vary or be enlarged according to their knowledge and experience. Thus the interpretation of decoration on ancient ceramics is a complex task, and requires more sources of information than vessel remains alone.

In late pre-Hispanic central Mexico most of the decoration on ceramics was made with painting (see e.g., Cervantes *et al.* 2007; Noguera 1954; Whalen and Parsons 1982). During the florescence of Teotihuacan several centuries earlier, in contrast, ornamentation was often made with incisions, carving and applications (see Rattray 2001). In the valley of Mexico common serving vessels, as well as elegant versions, were often painted following two widespread styles, the orange with black decoration and the red decoration. Orange ware with black designs on the natural fired color of the surface (Black-on-Orange ware) was the most frequent. The patterns of the black decoration had chronological and spatial variation (see Blanton and Parsons 1971:298; Cervantes and Fournier 1995:100; Cervantes *et al.* 2007; Minc *et al.* 1994; Whalen and Parsons 1982:441). Early vessels, that is, made in the Early Aztec period, from about the tenth century till the rise of the Aztec empire in the fourteenth century (ca. AD 900-1350, Brumfiel 2005; Sanders *et al.* 1979), were decorated with patterns of thick black lines and curvilinear motifs. Late vessels, that is, made in the Late Aztec period, from the rise of the empire till the conquest (ca. AD

1350-1521, Cervantes *et al.* 2007:280; Charlton 2000; Hare and Smith 1996), were decorated with similar patterns but lines and motifs were markedly thinner and more homogeneous (Figure 4). Early vessels also show variation in composition of decoration according to their spatial distribution. Leah Minc *et al.* (1994) have identified three different decorative patterns associated to three regions of the valley. Furthermore, both early and late vessels included in the decoration several signs that were part of the corpus of pictographic writing used at that time in central Mexico, such as the step-fret called in Nahuatl *xicalcolihqui*,⁴ conventionalized representations of feathers and precious stones, which were often used to symbolize qualities such as nobility and preciousness in pre-colonial books, architecture and objects. Less common motifs were stylized serpent heads and the 'Maltese' cross, symbol of *tlillan*,⁵ 'blackness' in Nahuatl (Anders *et al.* 1991:222-223), which could have more complex meanings. In the vessels these signs might occur isolated, like at the bottom of plates and bowls, or combined with groups of lines and curvilinear motifs painted on bands on the walls.

Red Ware, in contrast, had different decoration. These vessels were ornamented with large sections of thick and well polished red paint, and often black designs (Figure 5); less frequently they also included white painting or incisions (see Blanton and Parsons 1971: 309; Cervantes and Fournier 1995:100; Cervantes *et al.* 2007:300; Whalen and Parsons 1982:446, 450). Although their spatial and chronological variation is less known, we can recognize that the decoration of Early Aztec and Late Aztec vessels was fairly different. Early examples usually had in the walls several thick vertical black lines separated various centimeters from each other while later examples had thinner lines, often grouped in various sets. Less frequently, potters made red vessels with black and white lines and motifs. The small fragments found in archeological contexts show more complex decoration than other Red Wares, such as bands of different colors, geometrical motifs and

⁴ *Xicalcolihqui* was the Nahuatl name at that time for a standard and frequent step-fret motif composed of three steps linked to a hook. In the so-called *Magliabechi Codex* (1983:6) is represented a blanket with this motif with the gloss 'manta de jicara tuerta', which is the literal translation of the word *xicalcolihqui*. This sign possibly had different meanings in Mesoamerica since it occurs since the third century in different pictographic themes, contexts and places. In the Maya and Mixtec areas it was associated to nobility contexts and important lineages.

⁵ In various place-names and titles in the *Codex Mendoza* (1992:18r, 46r, 65r) this word is represented with such a motif.

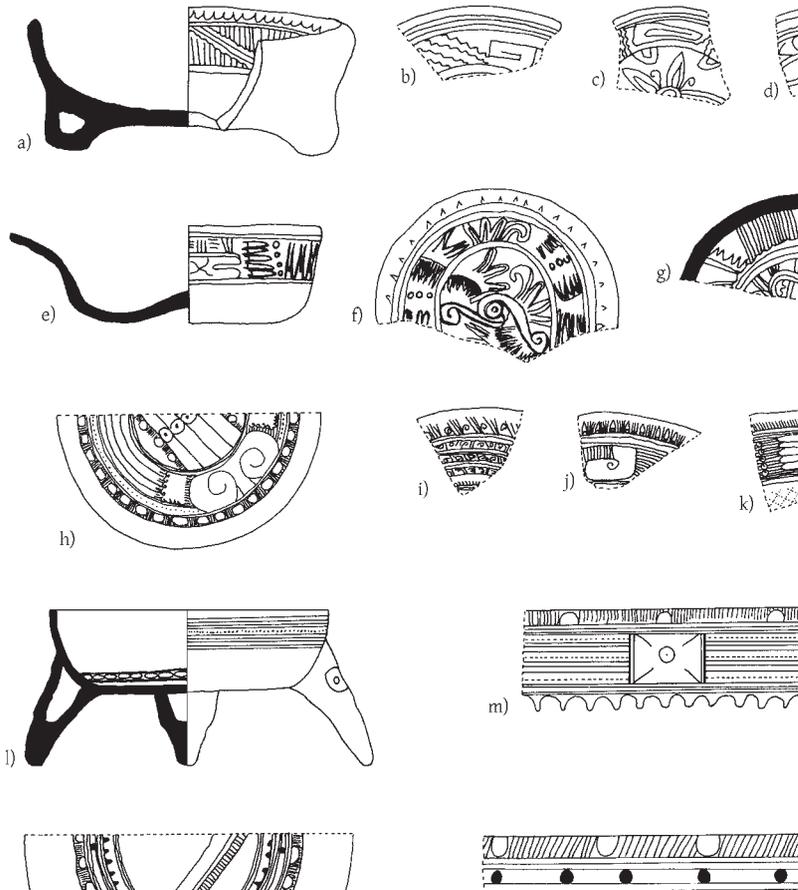


Figure 4. Patterns of decoration on Early and Late Aztec Black-on-Orange vessels from the valley of Mexico: (a) Early Aztec tripod bowl (based on Minc *et al.* 1994: Fig. 6.2a) (b) Early Aztec bowl (based on Minc *et al.* 1994: Fig. 6.3b) (c) Early Aztec bowl (based on Minc *et al.* 1994: Fig. 6.3d) (d) Early Aztec tripod plate (based on Minc *et al.* 1994: Fig. 6.4f) (e) Early Aztec bowl (based on Cervantes *et al.* 2007: Fig. 9) (f) Early Aztec plate (based on Cervantes *et al.* 2007: Fig. 14) (g) Early Aztec plate (based on Minc *et al.* 1994: Fig. 6.4k) (h) Early Aztec plate (based on Cervantes *et al.* 2007: Fig. 23) (i) Early Aztec bowl (based on Minc *et al.* 1994: Fig. 6.6h) (j) Early Aztec bowl (based on Minc *et al.* 1994: Fig. 6.5i) (k) Early Aztec tripod bowl (based on Minc *et al.* 1994: Fig. 6.5k) (l) Late Aztec tripod bowl (based on Cervantes and Fournier 1995: Fig. 2) (m) decoration pattern on Late Aztec plate (based on Cervantes and Fournier 1995: Fig. 8) (n) Late Aztec plate (based on Cervantes and Fournier 1995: Fig. 5) and (o) decoration pattern on Late Aztec bowl (based on Cervantes and Fournier 1995: Fig. 9).

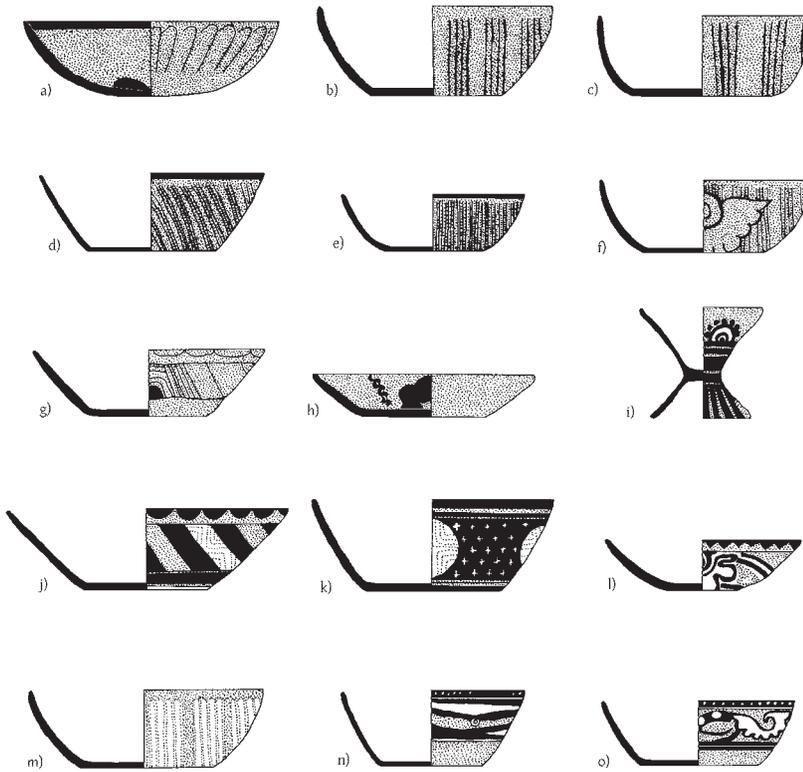


Figure 5. Patterns of decoration on late pre-Hispanic Red Wares from the valley of Mexico: (a) Early Aztec Black-on-Red bowl (based on Cervantes *et al.* 2007: Fig. 15) (b, c) Late Aztec Black-on-Red bowls (based on Charlton *et al.* 1995: Fig. 1) (d, e, f) Late Aztec Black-on-Red bowls (based on Cervantes *et al.* 2007: Fig. 61) (g, h, i) Late Aztec Black-on-Red vessels (based on Charlton *et al.* 2007: Fig. 19) (j, k, l) Late Aztec White-and-Black-on-Red bowls (based on Cervantes *et al.* 2007: Fig. 62) (m) Late Aztec White-on-Red bowl (based on Cervantes *et al.* 2007: Fig. 39) (n, o) Late Aztec White-and-Black-on-Red bowls (based on Cervantes *et al.* 2007: Fig. 43).

curvilinear designs, and occasionally shells in cross-section. In addition, potters produced red vessels with black lines and curvilinear motifs surrounded by incisions forming patterns different to those on other Red Wares. It seems that these vessels were only made during the Early Aztec period (ca. AD 900-1350) (Whalen and Parsons 1982:446). All these Red Wares and the Black-on-Orange wares were common serving vessels made in several places in the valley, as compositional analysis of the clay suggests (Minc *et al.* 1994). The painted

designs were in general simple, schematic and hastily done, which suggests that they did not play a special role in the communication of meanings relevant to the contexts where these objects were to be used. Black-on-Orange wares and Red Wares, however, did not share decorative patterns at all and their firing process was to some extent different, which may indicate that they were made in separate workshops.

In addition, potters of the valley of Mexico made less frequently a better polished and more colorful serving ware that consisted of orange vessels with red, black, orange and white motifs (called Chalco Polychrome by Whalen and Parsons 1982:441, 446). Although the majority of the extant examples are small fragments that do not permit us to identify the polychrome decoration in detail, we can recognize lines, bands, geometric elements and more complex motifs such as representations of feathers and precious stones. It seems that these vessels were more frequent in the Early Aztec period (Whalen and Parsons 1982:441-450). Potters also manufactured some objects of superior quality with complex pictographic decoration (Aztec Polychromes, Vega 1975:25) such as those found in the excavations of the Templo Mayor and its surroundings (Batres 1979; López Luján 1993). These vessels were painted with a number of signs and thematic groups of signs of the pictographic writing of that time in central Mexico. The context of these signs in other media and colonial documents suggests that they were associated to important meanings in the context of Mesoamerican ceremonialism, such as piety, preciousness, nobility, but also to deeper religious concepts, as will be discussed later in this chapter (see also Hernández 2005). Besides all these painted wares, potters also made censers and braziers decorated with other techniques, such as incisions, perforations and applications. Since early times in central Mexico these methods of decoration were distinctive of this kind of artifact frequently exposed to fire.

In Cholula late pre-Hispanic potters also decorated their vessels with painting, but they developed local styles different to those of the valley of Mexico. Since around the tenth century there were made polychrome serving wares (see Lind 1994; McCafferty 2001), that is, vessels with a white thin slip covered by a well-polished orange slip, and red, white, orange and black decoration. It consisted of bands of motifs, such as lines, curvilinear elements and schematic representations of feathers, precious stones and *xicalcolihqui*, disposed around the vessel's walls and bottom. Motifs and their style had modifications through the last centuries before the conquest (see Hernández 2005;

Lind 1994; Noguera 1954; Rojas 2008). Some early examples (ca. AD 950-1150, Lind 1994:81) had similarity to the painted wares of the valley of Mexico. Although the colorful vessels were better done than contemporary plain wares for serving, they were still common and frequent utensils accessible to a large part of the population, as their archeological contexts suggest. In the last two centuries before the conquest potters produced, besides the common polychrome wares, also finer and more exclusive serving vessels with complex and colorful decoration and high quality finishing. These polychrome vessels had signs and arrangements of signs from the pictographic corpus of central Mexico depicted in the same style as in the valley of Mexico (Figure 6), though it seems that they were more renowned than the vessels made in the valley, as Díaz del Castillo (1980:167) mentions that they were also used at Moctezuma's palace. In the region of Tlaxcala, and in Cuauhtinchan, Tepeaca and Tepeji, east of the valley of Puebla-Tlaxcala, there were also made colorful serving wares decorated like the common polychromes of Cholula (Castillo 2007:120-125). In addition, in towns not far from this city, like Huejotzingo, Ocotelulco and Tizatlan, there were also manufactured fine polychrome vessels with pictographic decoration (Castillo 2007; Contreras 1994).

In the valley of Morelos potters also decorated their vessels with painting. Red wares similar to those of the valley of Mexico were the most common (see Smith 2006b, 2007). These vessels had a red slip, and on it black lines, geometric motifs and curvilinear elements with a lot of variation in composition. Sometimes decoration patterns were similar to those of the valley, but there were also various local styles. Potters also made a polychrome ware, that is, vessels with white slip and red, black and orange designs. The painted motifs were simple, like lines and curvilinear and geometric elements, although there was a lot of variation in composition. Both red and polychrome wares were common serving vessels.

To sum up, in late pre-Hispanic central Mexico ceramics for serving were often decorated with painting, although there were many local styles. Painted motifs were in general vivid, but simple and hastily done, thus we believe that they did not have important intended meanings in the contexts where the vessels were to be used. Not all serving vessels were decorated, however. In every region here considered, potters also produced simple and undecorated serving wares. In addition, in the last centuries before the conquest potters made a

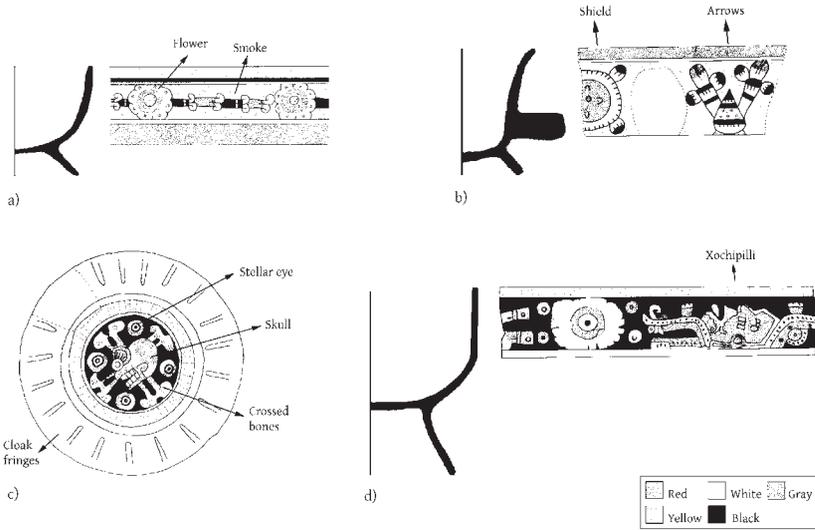


Figure 6. Pictographic decoration on late pre-Hispanic fine polychrome vessels from Cholula: (a) goblet deposited at INAH-Puebla (b) censer deposited at Universidad de las Américas-Puebla (c) plate of frying-pan censer deposited at INAH-Puebla (d) goblet deposited at Universidad de las Américas-Puebla.

higher quality ware with more complex decoration. The majority of these fine polychrome vessels were for serving, although there were also censers. We believe they were used in feasting, in particular at prominent places such as palaces and temples, although, as their archeological context shows, they were also present in domestic spheres and served as offerings in burials (see Hernández 2010).

(f) *Assembling vessel shapes*

The shape of ceramic objects is the result of several interconnected variables: function, physical properties of materials, forming method and aesthetic preferences of potters. Therefore the form of a vessel may change even if its function remains the same. Likewise, shifts in function may not be evident in its shape. The technique to make particular vessel shapes can be learned and transmitted through generations. Nevertheless, potters can easily modify their size, proportions and silhouette by the influence of users, relatives, neighbors or fellow potters. Even if vessels are completely made by mold, potters can simply alter their shape by using a new mold. In addition, potters nor-

mally produce particular assemblages of vessels. That is, they made a specific variety of vessels for cooking, such as several kinds and sizes of *ollas*, bowls and *comales*, as well as a variety of vessels for serving food and drink, like bowls, dishes, plates, goblets and vases, and usually also several objects for ritual purposes, such as different kinds of censers. The variation in the repertoire of vessel shapes across time and space is meaningful. In particular the variation between different functional classes of objects is interesting for archaeologists, as it may reflect consume and stylistic preferences, variation in cooking and eating habits, and the role of ceramics in ritual practices.

Although late pre-Hispanic central Mexican potters made a wide variety of vessel forms, in the regions here considered the shape repertoire was in broad term similar. In the valley of Mexico the most common vessels designed for cooking, storage and transportation were orange high-necked and short-necked *ollas* of various sizes, some of them with globular bodies and three handles on the shoulders, as well as basins with upright walls or flaring walls (Figure 7) (see Blanton and Parsons 1971:299; Cervantes *et al.* 2007:283-284; Whalen and Parsons 1982:438-441, 450). There were also simple hemispherical bowls (smaller, better finished and with thinner walls than basins) and *comales*. These common vessels, little visible as they were used in domestic contexts, did not present notorious changes from the Early to the Late Aztec periods. Exceptions are the *comales* that became thinner and more curved in later times (Whalen and Parsons 1982:450).

Elizabeth Brumfiel (1991:240-241) found that in several places of the valley of Mexico the ratio of cooking pots to griddles decreases from the Early to the Late Aztec periods. According to her, this shows that in Late Aztec times people preferred more dry griddle foods (instead of maize porridges or soups cooked in bowls and *ollas*), and this might be related to a more mobile labor force at that time as *tortillas*, *totopos* and other dry griddle foods are easier to carry and consume away from home. In addition, Garraty (2006a:163-164) studied the variability of vessels' attributes in the valley of Mexico during the Early and Late Aztec periods. He found that Early Aztec cooking vessels had more variation in attributes (like shape of the rim, thickness of the walls) than serving vessels, which suggests that cooking vessels were produced in more places for local consumers, while serving vessels were apparently produced in fewer large-scale production places. In contrast, in the Late Aztec period the attribute variability is lower

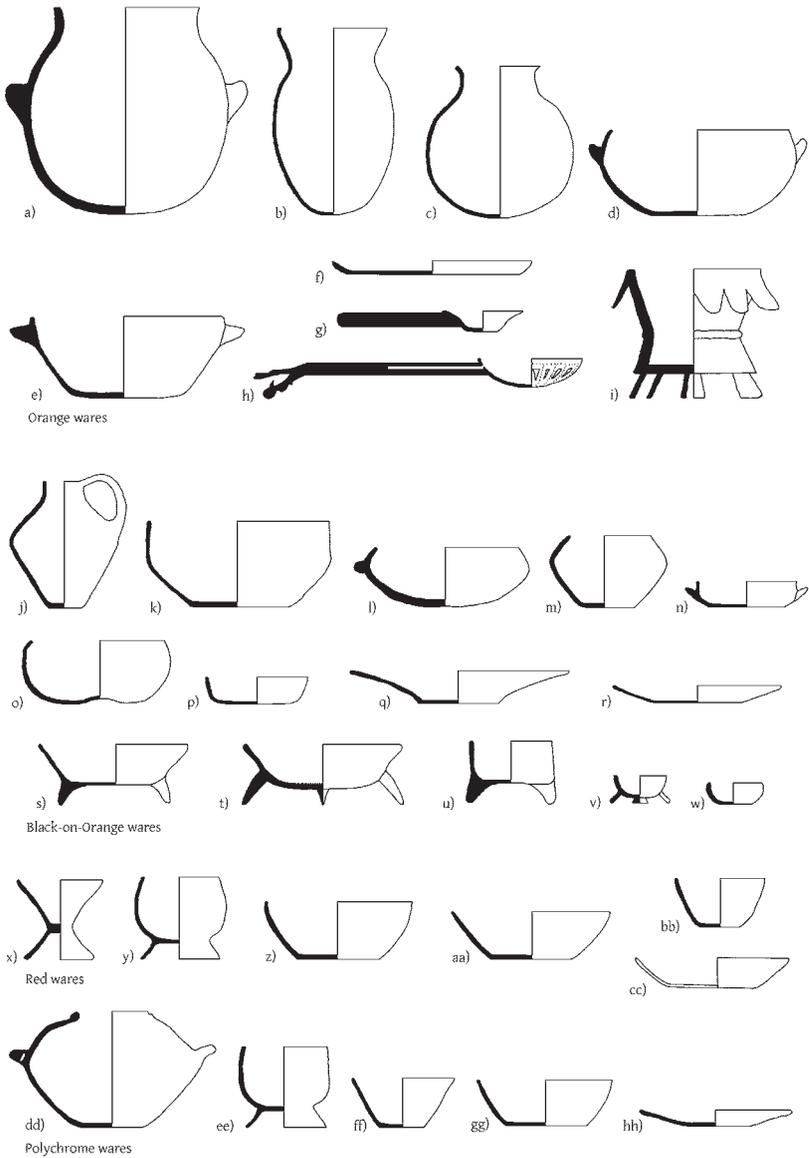


Figure 7. Late pre-Hispanic vessel shapes in the valley of Mexico: (a, b, c) *ollas* (d) basin with upright walls (e) basin with flaring walls (f) *comal* (g,h, i) censers (j) pitcher (k) basin with upright walls (l, m) hemispherical bowls (n) bowl with upright walls (o) hemispherical bowl (p) bowl with upright walls (q) bowl with flaring walls (r) dish (s) tripod bowl with flaring walls (t) *molcajete* (u) bowl with upright walls (v, w) miniatures (x, y) goblets (z, aa, bb, cc) bowls with upright bowls (dd) bowl with composite silhouette (ee) goblet (ff, gg) bowls with upright walls (hh) plate. Not scaled.

both for cooking and serving vessels, and this may imply the existence of fewer pottery centers in the valley which were involved in large-scale production and distribution (Garraty 2006a:199-201).

Common vessels designed for serving food and drink were the Black-on-Orange bowls with upright or flared walls, dishes (lower than bowls) with large tripod supports that could be solid conical, hollow cylindrical or wide thin slabs, *molcajetes* (bowls with striated interior bottom for grinding chilli sauces) with the same kind of supports, and plates (lower than dishes and without supports) (Blanton and Parsons 1971:294; Whalen and Parsons 1982:441, 450). The size of all these vessels could be appropriate for individual servings or for small portions of food, but there were also basins and pitchers decorated in the same style that were larger, as if they were for several portions of food and drink. The shapes of Red Wares were slightly different and less varied than Black-on-Orange vessel shapes. Most of them were bowls with upright walls and no appendages of any kind; though occasionally there were also goblets with high pedestal base and hemispherical bowls with tripod conical supports (Blanton and Parsons 1971:309; Brumfiel 2004:247; Cervantes *et al.* 2007:298-99; Charlton *et al.* 1995:139; Whalen and Parsons 1982:450). All these common, and more visible, serving vessels did not evidence notorious changes from the early to the late period; only their walls became thinner in later times. The common polychrome ware had less formal variety; most vessels were shallow bowls with flared walls and tripod hollow cylindrical supports (Whalen and Parsons 1982:441, 446). In contrast, the fine polychrome vessels with pictographic decoration had a large formal inventory, similar to that of analogous vessels from Cholula. In addition, potters made censers, well-known ritual paraphernalia in ancient Mesoamerica. Usually they were basins with a long handle, often finishing in a serpent-head (Charlton *et al.* 2007:453-454), but there were also larger basins with high upright walls and complex applied decoration (Cervantes *et al.* 2007:303). Containers for salt-making had upright and thick walls; some of conical silhouette, others of straight silhouette with flat base (Blanton and Parsons 1971:312-313; Charlton *et al.* 2007:453).

In Cholula, as in other places of the valley of Puebla-Tlaxcala (see Castillo 2007), vessels designed for cooking, storage and transportation were in general terms similar to those of the valley of Mexico. The same was the case for the regular decorated vessels for serving. In Cholula the most common shapes of this kind of object were bowls

with upright or flared walls and tripod supports, dishes with tripod supports and plates without supports. Earlier vessels had large hollow cylindrical supports while later examples usually had solid conical supports. The fine polychrome ware with pictographic decoration had, in contrast, a wide variety of shapes, which suggests that it was made for different uses. A number of them were censers, though most were designed as serving vessels (Figure 8). Some were appropriate for drinking, like goblets, jars, vases and hemispherical bowls. Other vessels would have been appropriate for individual consumption, such as plates, tripod bowls and hemispherical bowls, and some would have been used for the collective serving of food and drink such as pitchers, craters, bottles and big bowls. From their shape and high quality, these vessels were probably serving wares for feasting, but some of them were also containers for offerings of food, beverages or other substances, given the fact that they have been found in burials and are represented in codices as receptacles for offerings during diverse ritual activities. For example, in the *Codex Borgia* (e.g., 1993:8, 24, 45) and the Mixtec codices (e.g., Nuttall 1992:12), vessels of similar shape appear as containers for food, burning resins, *pulque*, cacao or blood in diverse ceremonies. The vessels' repertoire of the fine polychromes in the valley of Puebla-Tlaxcala was similar to that of the valley of Mexico. Collections of complete and semicomplete vessels from the valley of Mexico: El Volador (Batres 1979) and Templo Mayor (López Luján 1993) and from several contexts in the valley of Puebla-Tlaxcala suggest that the most frequent shapes were goblets, bowls and vases (Hernández 2005:Table 8,2; Smith *et al.* 2003:Table 9,3). In contrast, in other regions where these wares appeared the assemblage of shapes was somewhat different. For example, in Oaxaca the most frequent form was the tripod jar, a shape not represented at all neither in Puebla-Tlaxcala nor in the valley of Mexico (Hernández 2005:223-236).

In the valley of Morelos vessels for cooking, storage and transportation were also similar to those of the valley of Mexico (see Smith 2007:158-160). In contrast, vessels for serving food and drink were to some extent different. The most common shape was the simple bowl with flared walls, while tripod vessels were quite rare; less frequent were the goblets with flared or globular walls and pedestal supports, and the jars. Censers with long handles and serpent heads were also present. In brief, the central Mexican vessel shapes reflect shared and widespread late pre-Hispanic habits, such as using ceramic containers

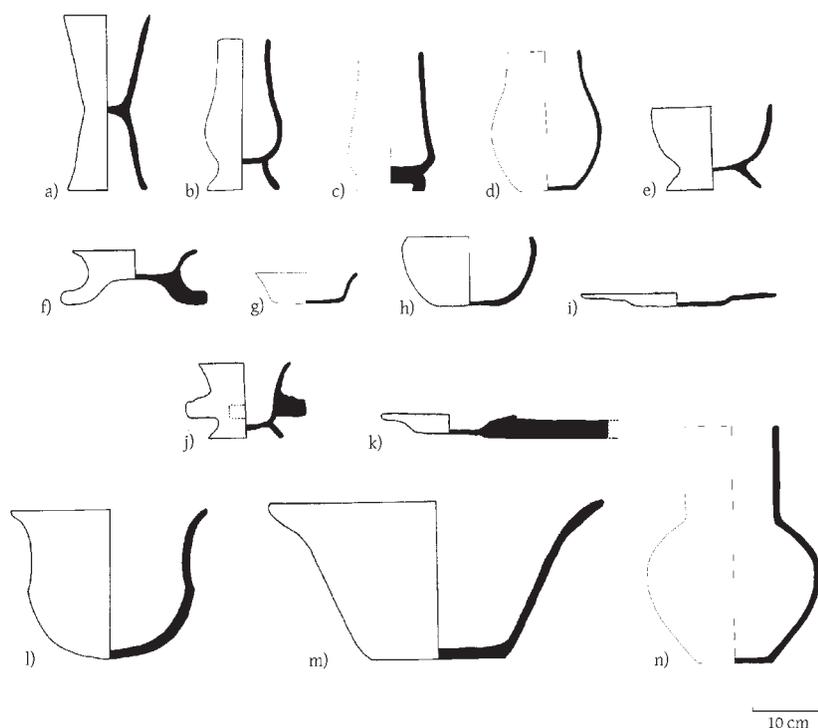


Figure 8. Shapes of late pre-Hispanic polychrome vessels with pictographic decoration from Cholula: (a, b, c) bi-conical vases (d) vase (e) goblet (f) tripod bowl with flaring walls (g) bowl with flaring walls (h) hemispherical bowl (i) plate (j, k) censers (l) composite silhouette basin (m) crater (n) bottle.

for cooking, eating, storage and transportation, making their own *tortillas*, eating and drinking from individual vessels, using censers to smoke both in public and domestic contexts, and having a special ware for more special uses like feasting, offering and other ceremonial activities. In addition, from the Early to the Late Aztec periods we observe a trend toward more standardization in vessel shapes, which seems to be a consequence of the existence of larger workshops involved in interregional exchange.

In sum, the variety of ceramic vessels made in central Mexico during the last centuries before the conquest was the result of the ways in which potters accomplished every stage of the process of manufacturing. In every one of these tasks there were diverse circumstances which

guided their work, in particular the manner in which they learnt this craft, their social network, their available natural resources but also the economic and political panorama. For this reason, they had in every step of the process different attitudes regarding continuity, change or innovation. An historical event that had considerable impact on parts of the process of manufacturing of some regional ceramic industries was the rise of the Aztec empire in the fourteen century.

The impact of the Aztec empire on ceramic-making

The indigenous historical manuscript known as *Tira de la Peregrinación* indicates that in 1163 the Aztecs began their migration to the valley of Mexico. The manuscript known as *Codex Mendoza* mentions that they founded Tenochtitlan in 1325. At present we call the span of time between both events the Early Aztec period, and the time after the foundation of that city till the Spanish conquest the Late Aztec period. According to Alva Ixtlixochitl (1975-1977), in 1428 the Aztecs together with the Acolhua of Texcoco and the Tepanec of Tlacopan created the Triple Alliance. They dominated the approximately fifty *altepetl* estimated for that moment in the valley (Hodge 1984:139-140), expanded to other regions and became an empire based on military control. In conquered places they did not remove ruling families, and they often became related by marriage to Aztec nobles, and established different terms of tribute according to local conditions and their own priorities. When the Spaniards arrived less than a hundred years later, large regions of Mesoamerica were tributaries of the Aztecs (see Barlow 1949; Berdan *et al.* 1996; Hassig 1988).

The empire brought various economic changes in central Mexico, which resounded also in the ceramic industry. Specialists using large collections of ceramics from extensive regional surveys and analytical methods for identifying vessels' provenance, agree that ceramics were widely traded within the valley of Mexico during the Early Aztec period but the rise of the empire brought important changes in their production and exchange (Garraty 2006b; Hodge and Minc 1990; Minc *et al.* 1994; Nichols *et al.* 2002). They identify that before the rise of the empire potters (or their intermediaries) traded their products in the several markets of their *altepetl* or associated centers, but only seldom in the markets of other places. According to Garraty (2006a:163,

190), at that time most workshops produced the whole range of non-decorated cooking vessels, which were only distributed in local or nearby markets, while decorated ceramics were often made in few more specialized workshops and had a wider circulation. After the rise of the empire ceramics were exchanged in a more centralized system. It seems that tribute collection and imperial control of trade and markets resulted in ceramics from a smaller number of places being widely distributed in the valley, and Tenochtitlan and its hinterland becoming the principal producer. However how this exchange functioned and how much control was exercised by the Triple Alliance is still unclear (see Charlton *et al.* 2008; Garraty 2006b; Hodge and Minc 1990; Minc *et al.* 1994; Nichols *et al.* 2002). In addition, the tributary plan of the empire probably altered the manufacturing specialization of some towns. For example, Cuauhtitlan was an important producer of ceramic vessels in the valley, however in the *Codex Mendoza* these products were not listed as part of its tribute obligations, which suggests that its inhabitants had to give more emphasis to other productive activities. Maybe this is true, but as an anonym reviewer of this work indicated, it is also possible that they simply kept on producing pottery and exchanged it in the market for products that they had to render in tribute.

Ceramics made in the valley of Mexico and associated with the Aztec culture were also distributed to several other regions, a difficult enterprise considering the transportation techniques at that time (i.e. lack of pack animals and the wheel) and the mountainous landscape of central Mexico. A detailed study of long-distance trade in imperial times (Smith 1990) shows that Black-on-Orange wares were the most common ceramic products of the valley exchanged in other regions. Most of the places in which those objects have been found were controlled by the empire, such as Calixtlahuaca, Malinalco, Cuernavaca and other localities in Morelos, and even remote settlements such as Coixtlahuaca and Quauhtochco. However some vessels were also present in regions not controlled by the empire, like the Tehuacan valley. According to Smith (1990:162), this shows that these ceramics were traded through common commercial networks and markets rather than through empire direction, although the political relations established by the Aztecs clearly facilitated such commercial exchange. Even if the shape and decoration of these common vessels followed the stylistic trends at that time, they had a distinctive Aztec flavor as in no other region were similar objects made. For Smith (1990:161), the

high frequency of common Aztec serving wares in many places is only one example of the recurrent and extensive interregional trade in central Mexico and neighboring regions during the last two centuries before the conquest, a time of high population increase and mobility. However Aztec ceramics were very rare in *altepetl* independent of the empire, like Tlaxcala or Cholula (see McCafferty 2001; Müller 1978; Noguera 1954). Even in those places potters did not decorate their vessels in styles alike to the Aztec orange and black vessels. This was rather unusual considering that during Teotihuacan times, and even earlier, ceramics from the valley of Puebla-Tlaxcala and the valley of Mexico were quite similar. The development of different local ceramic styles was possibly a result of reduced contact between those regions, but it could also be that certain animadversion to the Aztec empire played a role. In addition, the large and far distribution of Aztec common vessels contrasts with the very few ceramics from other regions found in the valley of Mexico. This suggests that interregional trade of ordinary goods not only responded to commercial needs of markets and contacts of traders, but also to the political situation at that time.

The interregional exchange of luxury ceramics probably had different channels of distribution, which were guided by other economic and political motivations. For example, fine polychrome objects with pictographic decoration were made in several regions of Mesoamerica, such as the Puebla-Tlaxcala valley, the valley of Mexico, the Mixtec region and the valley of Oaxaca as analytical studies of vessels' provenance show (Neff *et al.* 1994). They were even made in Western Mexico (Ekholm 1942; Meighan 1971:761) and the Greater Nicoya in Nicaragua and Costa Rica (Day 1994; McCafferty and Steinbrenner 2005). However, the vessels manufactured in Cholula were renowned and were present in important contexts of the Aztec capital. Moctezuma used this objects according... Also in two large deposits of fine serving vessels near the Templo Mayor, one in the ex-plaza del Volador (López Luján 1993:26) and the other in the street of Escalerillas (Batres 1979), several examples have been found that according to their shape and pictographic composition were from Cholula, or at least from nearby localities.⁶ These objects came from a place that was not integrated into the empire, but was an important religious

⁶ The shape and pictographic decoration of fine polychrome vessels varied according to the region of production. For example, vessels from Cholula have shapes and thematic complexes of signs that do not appear in the Mixtec area or the valley of Oaxaca and vice versa (see Hernández 2005; Lind 1994).

and pilgrimage center. Thus their exchange was probably not regulated by imperial economic strategies but by other cultural considerations. The two caches of fine vessels near the *Templo Mayor* might be ritual deposits after feasting, as the high quantity and concentration of fine vessels of similar function suggest (Smith *et al.* 2003). The vessels from Cholula could be acquired for those events, but they could also be fine gifts given during meetings and ceremonial events of the nobility and other prominent people. In addition, objects with complex decoration could be charged with important cultural meanings, a further motivation for their exchange to far regions. That is, ceramic vessels could also have other functions beyond their task as containers. A number of them were made to be ritual objects and even media of literacy.

Ceramics as ritual objects and media of literacy

In ancient Mesoamerica various traditions of ceramics with ritual decoration were developed in Classic times and later. Well-known today are the Maya vessels made from the fourth to tenth centuries painted with complex images that depicted gods and both public and private rituals of the nobility and a few glyphic texts (see Reents-Budet 1994). These texts were mainly phonetic, with some signs representing the sounds of syllables and others representing whole words in a particular language (logograms), but they were also pictographic (word signs picturing the object recorded) (Coe and van Stone 2005:18; Schele and Grube 1994:4). Often these glyphic texts were dedicatory statements referring in a formulaic way to the act of painting the vessel, its shape and original contents and the name of the patron or owner and the artist (Grube 1990:322-325; Houston *et al.* 1989:720). The archeological contexts of these vessels show that they were offerings in funerary ceremonies of privileged people, but their decoration and shape (many of them were vessels for drinking) suggest that they also had a role during important ritual events.

In Teotihuacan were also made polychrome vessels decorated with pictorial images and conventionalized signs although the meaning of those scenes and signs and their system of representation is today poorly understood as they seem to be highly emblematic (see Kubler 1967; Langley 1986, 1991). Many signs are iconic but others are abstract, and we still do not know if their meaning, or meanings, was

directly related to the object represented or to the associated ideas or sounds. Nevertheless, the high quality of the vessels and the depiction of ritual activities—such as acts of offering or dancing—and images with god attributes, suggest that they had also a ritual function. In other areas of the ancient Americas potters created similar objects as well. In the Andean region from the second to the ninth centuries, the Moche of the north coast of Peru finely decorated ceramic vessels with pictography representing episodes of the sacred history and other cultural narratives (see Jackson 2008).

The art of making ritual ceramics continued, or was invented again, in central Mexico during late pre-Hispanic times. Potters from the region made fine polychrome vessels with short pictographic texts that used similar signs and style of representation as the painted books of ritual and historical content of that epoch. The signs depicted on the vessels formed often standardized thematic complexes. That is, complexes of signs that seem to refer to central concepts of Mesoamerican ritual practice, as their context in pre-Hispanic painted books and the information in colonial pictographic books with explanatory alphabetical texts suggest. Some thematic complexes referred to ritual activities in general. For example, a quite frequent complex was formed by a band representing the sun plus bands of feathers and step-frets, common signs of nobility and preciousness (Figure 9). The sun in Mesoamerica was not only the principle of life, but also symbolized the sacred, and the affairs of the gods. This can be observed in the so-called *Codex Mendoza*, where several place names which included the Nahuatl particle *teotl*, ‘god’, or *teoyotl*, ‘sacred thing’, were pictographically represented by a sun (Berdan and Anawalt 1992:208).⁷ On the vessels’ solar band were usually painted the typical symbols of self-sacrifice, agave thorns and bone awls; a pair of signs which was often used in painted books as ideographic reference to piety, penitence and ritual purification (Jansen 1998:144; Nowotny 1961:27). In that way, vessels’ decoration referred to such central notions of Mesoamerican rituality. Other thematic complexes seem to be associated with particular kinds of ceremonies like, for example, the cult to the ancestors, propitiation of agricultural fertility, ceremonial drinking of *pulque*, actions around warfare, and invocation to Quetzalcoatl or to powerful *nahuales* (for a detailed description

⁷ For example, Teoaçingo, the small sacred water, is depicted with half a solar disc, a water basin and the lower limbs of a man (*Codex Mendoza* 1992:16r).

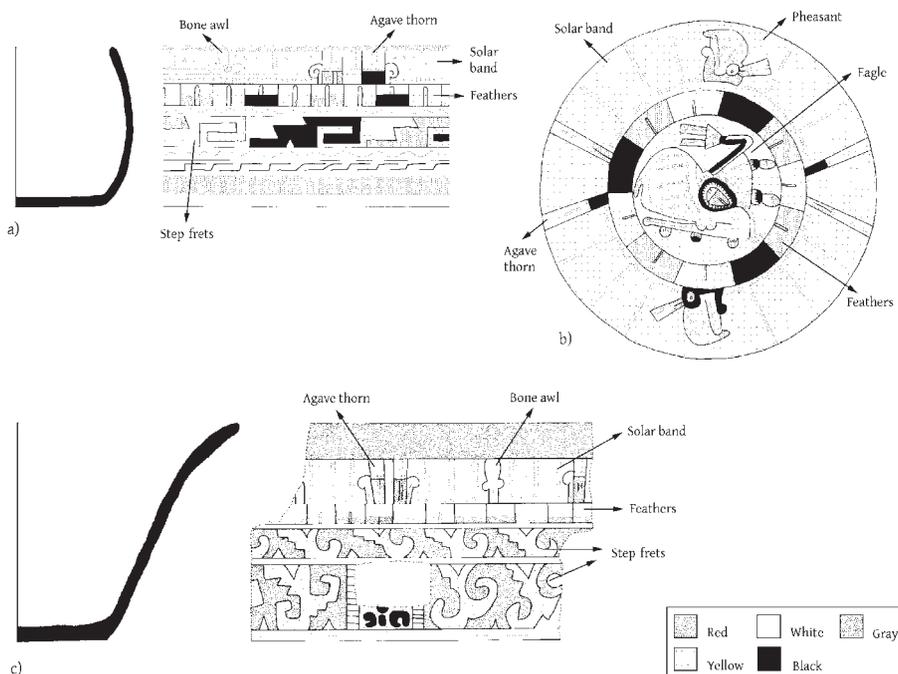


Figure 9. Fine polychrome vessels from Cholula with pictographic decoration representing the “complex of the solar band”: (a) hemispherical bowl deposited at the Universidad de las Américas-Puebla (b) plate deposited at INAH-Puebla (c) crater deposited at INAH-Puebla.

and interpretation of the complexes see Hernández 2005, 2010). In those thematic complexes were included signs with clear religious and ritual connotations, for example, images of gods (e.g., the faces of Xochipilli, Xipe or Tezcatlipoca), attributes of gods (e.g., the snail jewel, earplug or *maxtlatl* of Quetzalcoatl), or ritual symbols (e.g., cut paper, smoke, animated flints) (Figure 10). There were also signs of the late pre-Hispanic iconography of death and the death gods (e.g., skulls, bones, inner organs, severed hands, eyeballs out of their sockets), or of war and military (e.g., arrows, banner and shields, war pathways). In my opinion, the combination of several of those signs on one vessel made possible the transmission of important messages in the context of the Mesoamerican rituality. Not all codex-style vessels had such elaborate decoration, however. There were also vessels with simpler pictography, like bands of signs referring to common notions

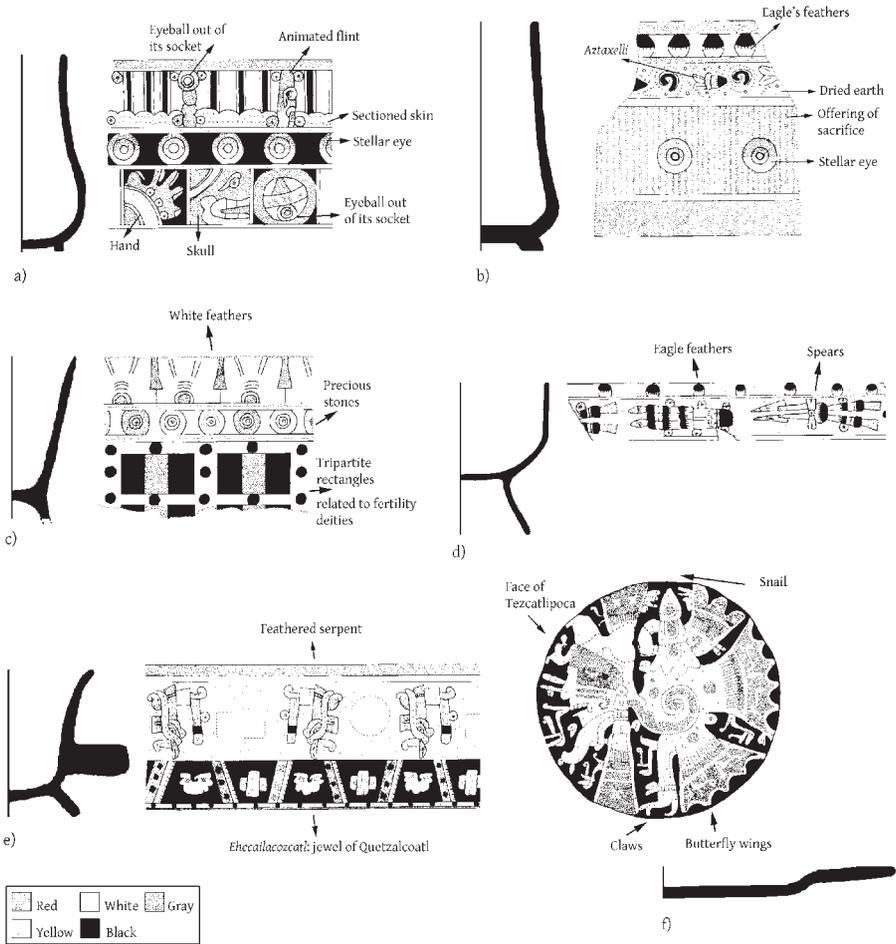


Figure 10. Fine polychrome vessels from Cholula with pictographic complexes with religious and ritual connotations: (a) vase referring to the cult of the ancestors deposited at INAH-Tlaxcala (b) vase referring to propitiation of agricultural fertility deposited at INAH-Tlaxcala (c) bi-conical vase referring to *pulque* and fertility deposited at Universidad de las Américas-Puebla (d) goblet referring to actions around warfare deposited at Universidad de las Américas-Puebla (e) censer referring to the invocation of Quetzalcoatl deposited at INAH-Puebla (f) plate referring to the invocation of powerful *nahuales* deposited at INAH-Tlaxcala.

in ceremonial contexts such as feathers (nobility), precious stones or textiles (luxury), flowers (beauty) or stellar eyes (darkness).

Messages were depicted on the vessels in a standardized, simplified and repetitive manner. That is, signs usually appear in bands around the vessel's surface, and are often represented in pairs. A few of them are well-known Mesoamerican *difrasismos*, or diphrastic kennings, that is, couplings of words that in combination produce new meanings (Garibay 1987:67). For example, known *difrasismos* on the vessels are 'the shield, the arrows', which stands for warrior; 'the flower, the song' that stands for poetry (León Portilla 1970:75), or 'the eagle, the fire serpent', which stands for *nahual* priest.⁸ Diphrastic kennings, together with repetitions and parallelisms of ideas, were rhetorical devices used for ceremonial and formal speech and writing in Mesoamerica. This suggests that the messages painted on the vessels were constructed using the distinctive poetic style of such contexts. Original users of the vessels must have understood the messages, at least on a certain level. However it may also be that some complexes of signs, which look simple, were in fact deep metaphorical ritual concepts the meanings of which were difficult to access since they were represented using the conventions of the ceremonial language, like diphrastic kennings. Thus, it may have been the case that beholders of these vessels who were not familiar with such conventions were not able to understand some of their meanings.

Ceramic vessels with pictographic decoration were media to communicate across time and space in pre-Hispanic Mesoamerica. This kind of pictography can be considered as a semasiographic writing system, as ideas were mainly communicated directly through visual marks and not through phonetic symbols (Sampson 1985:29). Although the properties and communicative possibilities of a small text painted on a ceramic vessel are very different from the broad narrative spaces of painted books, vessels were also involved in the dynamics of literacy at that time. The full skills of production and decodification of writing were highly restricted in pre-Hispanic Mesoamerica, nevertheless the orality and performance closely associated with texts permitted various levels of proficiency (for a discussion on this topic see Anders *et al.* 1994:97; Boone 1994:15-17; Grube and

⁸ In Mixtec *yaha yahui*, translated by Alvarado in his vocabulary as 'eagle fire serpent'; and *nigromántico señor* ('lord sorcerer'), was a title equivalent to *nahual* priest (Anders *et al.* 1992:184-186; Jansen and Pérez Jiménez 2003).

Arellano 1998:31-33; Houston 2008:232; Jansen 1998:152; Jansen and Pérez Jiménez 2000; Monaghan 1994:88). In the case of ceramics, they could only be produced by specialists as not only were manufacturing skills required but it was also necessary to be well familiarized with the system of pictographic writing and the religious meanings associated to signs. Texts on vessels were not copies of segments of books or murals. Although all these media shared the same corpus of signs, vessels had their own system of representation, their own themes and their own manner of simplifying complex ritual and religious meanings. Vessels were not mass produced rather than unique works. For example, from a dataset of 467 objects (complete and semi-complete) that I studied elsewhere (Hernández 2005, 2010), and that were taken from archeological collections, museums and publications, constituting all known accessible polychrome vessels with painted decoration in central Mexican style, no two vessels were identical even when in many cases similar complexes of signs were depicted. While only experts could produce complex pictographic texts on ceramics, it is possible that many people could understand them, at least at a certain level, as many signs were common and well-known elements of the Mesoamerican visual culture in ritual contexts at that time. Thus there were probably several levels of literacy related to these objects.

As in other communication processes, vessels and their messages were linked to receivers through performance. These vessels were probably ware for feasting, according to their shape and their frequent archeological association to public and high-status contexts in central Mexico. That is, they have been recovered in excavations of public and ceremonial areas such as the Great Pyramid at Cholula (Marquina 1970), the Great Platform in Tizatlán, and various rooms close to the polychrome altar of Ocotelulco (Contreras 1994). Also they have been found in fills and trash pits in high-status neighborhoods in pre-colonial times, like the barrio of Tianguiznahuac, a sector inhabited by nobles and merchants in Postclassic Cholula according to Gabriel de Rojas (1985:129). Also several of these vessels were deposited in an offering cache in the Templo Mayor in Tenochtitlan (López Luján 1993). Moreover, some vessels were offerings in burials (Suárez 1989). Nevertheless, in domestic areas on the periphery of Cholula, fragments of these vessels have been found in trash pits and building fills (Hernández 2005:42; Suárez *et al.* 1992). This suggests that not only a restricted sector of the population had access to them, although the nature of these Cholultecan domestic deposits still requires more

analysis (see Plunket and Uruñuela 2005). The events represented by those archaeological remains -public ceremonies, feasts, offerings and funerary rituals- were, and still are, essential elements of community life in Mesoamerica. In that environment the common use, understanding and appraisal of these vessels and their messages helped to create feelings of solidarity. In sum, in central Mexico during the last centuries before the conquest, not only did writing have an important role in ritual practice, but ceramics were also major media to connect such writing to ceremonial life. These kinds of vessels had decoration that made them meaningful in the context where they were used.

Summary

Late pre-Hispanic archeological remains suggests that potters from the various regions of central Mexico used similar technology for manufacturing ceramics. That is, in general terms they had comparable methods for forming and firing, and created vessels using similar stylistic and formal canons. Although there was a lot of local variation in decorative patterns, the majority showed the distinctive trends of that time in Mesoamerica, such as the use of polychrome decoration, the manufacture of bowls with large tripod supports or goblets with large pedestal. Local variation in decoration was likely the result of different familiar and communal traditions or idiosyncratic preferences of potters but the political and economic situation at larger scale might also have played a role. For example, the imperial intentions of the Aztecs might have contributed to the differences in decorative patterns in ceramics between the valley of Puebla-Tlaxcala and the valley of Mexico.

In broad terms during the last five hundred years before the conquest clay recipes, forming methods or firing processes in central Mexico did not have significant changes. Decoration in contrast was repeatedly modified. In general, early vessels had less decoration while late vessels were painted with finer linear patterns and more complex motifs, although there were exceptions. For example, a few Early Postclassic polychrome vessels from Cholula show complex figurative decoration (see Rojas 2008). As we will see in the next chapter, some parts of the process of manufacture are modified after the conquest. Ceramic vessels during the last centuries before the conquest were primarily domestic equipment for a variety of uses. Decorated vessels

with fine quality of manufacture were mainly for serving food and drink on special occasions such as feasts. As these objects were costly, they were also more frequent in the houses of noble and more prosperous families. Ceramics were also used as censers; large and elaborately decorated examples were common in temples, but there were also smaller and simpler objects for quotidian and domestic uses. Also, vessels of all kinds could be recipients for offerings in funerary rituals, inauguration of buildings and other ceremonies, as their archeological contexts in central Mexico show. In addition, vessels had other social functions beyond their task as containers; they were in some situations ritual objects and media of literacy. As we will see, some of these functions disappear after the conquest.

CHAPTER FOUR

CERAMIC-MAKING IN EARLY COLONIAL TIMES

After the Spanish conquest many indigenous crafts continued to be manufactured in central Mexico. From the scarce documentary information on those activities we can infer that during the first colonial decades the production or trade of native goods for native consumers in general did not attract the colonizers, who were looking for other means to make money. According to Gibson (1964:335), colonial secular authorities did not openly interfere in the course of indigenous crafts nor dedicated itself to their eradication. As we will see in this chapter, native ceramics of the early colonial period suggest that the technology of production was long maintained, even after important social and economic changes altered other parts of indigenous life. Archaeological research also shows that other common crafts continued with the same method of manufacture in the first post-conquest years, such as the production of obsidian cutting tools (Rodríguez Alegria 2008:39-40) and cloth (Brumfiel 1996).

On the eve of the conquest artisans and artists made a wide variety of objects, in many materials and styles, in which dexterity, creativity and aesthetics played important roles. This apparently continued into the colonial period as Spanish documents, otherwise so negative in reference to the character of indigenous people, recognize the good quality and inventiveness of their craftsmanship. As Friar Bernardino de Sahagún (1992, X:578), actually trying to make a statement in favor of the missionaries' teaching labor, wrote "... en los oficios mecánicos son hábiles para aprenderlos y usarlos ... como son oficios de geometría ... albañilería, y cantería, y carpintería ... todo esto tenemos por experiencia que tienen habilidad para ello y lo aprenden y lo saben, y lo enseñan, y no hay arte ninguna que no tengan habilidad para aprenderla y usarla."¹ Nevertheless, the enormous impact of the conquest on essential aspects of indigenous life such as land tenure,

¹ "... they are skillful to learn and practice mechanical trades ... such as geometry ... masonry, lapidary and carpentry trades ... we have experience about all this, that they are skilful for this and they learn and know and teach it, and there is no art in which they do not have ability to learn and to use." (Sahagún 1992, X:578).

religion, language and the system of administration also had effects on the native crafts, such as ceramic-making.

Without diminishing its profound and dramatic consequences, the reduction of communal and other forms of indigenous land gave in my opinion a positive impulse to the well-established native craft production in early post-conquest times. The loss of land as a consequence of major population decrease after epidemics, appropriation by *encomiendas* during the mid-sixteenth century, reorganization and concentration of towns during the *congregación* orders at the beginning of the seventeenth century, and other means for transferring land to colonizers' hands (see Gibson 1964:257-264; Lockhart 1992: 142-176), certainly encouraged alternative forms of subsistence that were not based on agriculture. That is, documents suggest that by the end of the first colonial generation indigenous artisans were manufacturing both Mesoamerican and Spanish-style products, at least in urban contexts. On the one side, they made quotidian native goods, including ceramics, to provide the still well organized and well supplied local markets (see Sahagún 1992, VIII:475-476; Super 1988). On the other, Sahagún also mentions that there were indigenous peoples who were blacksmiths (1992, X:553), candle makers (1992, X:575) and shoe makers (1992, X:576). Also Motolinia says in his *Historia de los Indios*, written between 1536 and 1541 (Burrus 1973:145), that they were already elaborating Spanish garments such as doublets, waistcoats and breeches, as well as swords, gloves, glass, metal artifacts, bells, leather shoes, saddles and bellows (Motolinia 1914:217, 1970:98). Although Sahagún's and Motolinia's comments do not give clues on how widespread the production of Spanish-style goods by indigenous craftpeople was, it is possible that this was accepted by the Spanish colonial administration in the first years after the conquest, as it was necessary to supply the cities. However, several decades later documents evidence the creation of guilds of Spanish artisans and regulations to protect the colonial market. For example, the Mexico City *cabildo* proceedings from February 1st of 1552 announced the prohibition for Spanish craftsmen to buy indigenous-made products with the purpose of reselling (Novelo 2007:96). This suggests that the production of Spanish-style objects by indigenous artisans became in some way problematic. Thus, before the end of the sixteenth century several Spanish craft guilds were organized in the city (see Carrera Estampa 1954). It seems that the first colonial potters' guild appears relatively late. The first documentary reference for a pottery guild is

the list of regulations of 1653 for Majolica ware production in the city of Puebla (see López Cervantes 1976:15). One of its purposes was to protect Spanish artisans from other potters who apparently were also manufacturing that kind of pottery.

The introduction of Christian doctrine and the associated elimination of indigenous religious manifestations (see Burkhart 1989; Gibson 1964:99-235; Gruzinski 1993:146-284; Lockhart 1992:205-243) might also have had an impact on the Mesoamerican ceramic craft. In late pre-Hispanic times ceramics had a large variety of functions. As we can recognize from their morphology and archaeological context, the majority was for domestic uses, but there was also a vessels' repertoire for ritual purposes, such as censers of different shapes and fine vessels with pictographic decoration for feasting and offering (see Hernández 2005, 2010). Besides, archaeological remains evidence that common objects were used as containers for offerings in diverse rituals, such as funerals (as grave goods), inauguration of public and private buildings (deposited in offering caches under the floor, e.g. López Luján 1993) or other rituals in temples (e.g., the Aztec new fire ceremony, see Elson and Smith 2001). After the conquest most of the indigenous public religious rituals were eliminated, and consequently the associated paraphernalia disappeared. The typical pre-Hispanic censers with long handles were still used in urban centers of the valley of Mexico as well as in rural areas (at least in the region of Otumba) during early colonial times but they had disappeared by 1620 (Charlton *et al.* 2007:455). Nevertheless, the practice of burning resins during religious celebrations did not vanish; it became an important part of the indigenous Catholic ceremonialism, as we can still observe in present-day indigenous communities. Vessels decorated with religious and ritual pictography also disappeared. Polychrome wares with pictographic decoration were still made and used in the valley of Mexico and Cholula after the conquest, as is evidenced by a few examples in colonial contexts, and, as we will see later, by some decorations and vessel shapes with European influence (Lind 1987:23-27). However they disappeared by 1650 according to absolute dates from associated contexts (Lind 1994:81). In this case not only the decoration was lost, but also the practice of using vessels decorated with meaningful texts in diverse ceremonies disappeared. In addition, the custom of placing offerings, such as ceramic vessels, to the dead was lost when the Catholic funerary rituals were imposed. Thus, indigenous

ceramic-making after the conquest was concentrated on the production of quotidian objects.

The introduction of the Spanish language, and its imposition as *lingua franca* throughout Mesoamerica, also transformed the nomenclature system for ceramic forms and sizes, as we will see below in the section devoted to vessel shapes. The colonial administrative structure also had general effects on indigenous ceramic manufacturing. That is, the end of the Aztec empire resulted in the disruption of the well-developed long-distance and interregional exchange of goods characteristic of the last pre-Hispanic period (see Smith 1990), which also included ceramic wares. Also the separation in early times, at least in principle, of the indigenous and Spanish population in different sectors of the city, and even in different settlements, probably promoted the separation of indigenous-style and Spanish-style ceramics. For example, *La Traza*, an area that covered more or less a hundred blocks around the metropolitan cathedral in the center of Mexico City, was meant to be for public buildings of the colonial government and Spanish habitation (Flores 1970), although indigenous peoples continued living and working in this area after the conquest (Rodríguez Alegría 2002:164-168). In contrast, the houses of indigenous and other people were as a rule in the peripheries. There were as well indigenous settlements, such as Cholula, and settlements founded for Spanish occupation, such as Puebla. This separation that promoted differentiation of habits and material culture, likely also provoked the separation of indigenous-style and Spanish-style ceramics (see Charlton *et al.* 2005:62). At the same time, this segregation, together with the structure of the colonial social order, promoted in my opinion that in indigenous society luxury expressions and status symbols changed. Instead of the traditional feather works and polychrome ceramics, Spanish objects became highly valued and desirable. For example, Rodríguez de Alegría (2008:39) mentions that a document from 1641 granted permission to an indigenous elite from Xaltocan to ride horse back, carry sword and wear Spanish clothing.

Despite all these colonial changes, the indigenous community was maintained as the main social and political unit for regulating the life of native people and the interaction between colonizers and colonized (Lockhart 1992:15). That is, the local organization and its self-contained parts—such as neighborhoods, extended families and nuclear families—continued with few changes during the first colonial century. Thus, many social institutions, ritual practices and modes of sub-

sistence deeply embedded in the community were maintained. This was probably the case for many craft industries based on family workshops, such as ceramic-making, which still today is a family activity and is associated to particular communities. However, the *congregación* orders of 1603, which relocated the surviving rural population decimated by early epidemics, altered the panorama of the indigenous communities (Knight 2002:27-29). Few larger communities were retained as centers, while smaller and dispersed settlements were congregated in these centers or in new locations (Lockhart 1992:44-46). This modified land tenure and the organization, harmony and identities of the indigenous corporation. According to Lockhart (1992:44), often the moved population retained their cohesion in the new town, becoming a new neighborhood, but on occasion the moved people were separated into several settlements or was assimilated to other groups in the new location. Thus, around 1640-1650 (Lockhart 1992:427-430) indigenous communities began to transform parts of their ancient structure, and this promoted that Spanish elements penetrated more profoundly in their organization. As we will see later, indigenous ceramics also evidence more profound changes about that time.

Sources to study early colonial ceramics

As is the case for the pre-Hispanic period, no other region of Mesoamerica has been as extensively explored as the valley of Mexico in order to shed light on the colonial era. This is due to the existence of a vast corpus of documents referring to this area, and because major public works and conservation of colonial buildings have motivated archeological rescue of colonial contexts. Also a main reason is that Tenochtitlan/Mexico City was the core of the colonial world, where the interactions between different components of the colonial society were more vivid and had more material manifestations. In other regions of Mesoamerica there is also documentary information on the colonial era, but it is not as extensive as in the valley, and also it is often not accompanied by archeological exploration. The same applies for our knowledge on ceramic-making during that time; most of the comparatively scarce archeological research and documentary information is concentrated on the valley of Mexico.

Colonial chronicles and other historical documents, although abundant in central Mexico, offer very little information on indigenous ceramic manufacturing. A few manuscripts refer to Spanish-style ceramics, such as the *Ordenanzas de Loceros*, a list of regulations for potters specialized in Majolica wares in Puebla made in 1653. There are also a few brief comments in Mexico City *cabildo* proceedings from the mid-sixteenth and seventeenth centuries about rules for potters specialized in Spanish-style wares. In addition, in correspondence of colonial authorities there are a small number of observations on this craft. However, to my knowledge, the only extant early colonial manuscript directly referring to the manufacture of indigenous-style ceramics is the one named by Robert Barlow (1951) *Códice de los alfareros de Cuauhtitlan*.² It is a large strip of European paper with illustrations, pictographic writing and short Spanish texts. According to that text, this document was presented in 1564 by four potters of Cuauhtitlan to the judge of the same town in order to complain about the *alcalde mayor*, who did not fully pay them for an order of pots. This manuscript provides information about the kind of vessels produced at that time, their price and the situation of indigenous pottery-making in the early colonial period.

Archeological research of early colonial contexts in the valley of Mexico has been the result of different kinds of projects. First, major public works, such as the subway or the city's deep drainage, but also other building activities in different locations, have involved rescue excavations. Often archeologists have obtained large collections of ceramics and other materials of the colonial period. Second, several large conservation programs to restore convents and other colonial buildings, such as the ex-convento de San Jerónimo (Fournier 1990) or the Catedral metropolitana (Matos Moctezuma 1999), have also been interested in collecting and studying archeological ceramics. Also many archeological explorations focused on pre-Hispanic remains have obtained colonial materials as in Mexico City pre-colonial deposits are usually covered with large colonial deposits. This was the case, for example, for the excavations in the Templo Mayor (Matos Moctezuma 1982). In addition, the large-scale projects of surface survey made in the 1960s and 1970s that covered most of the valley of

² The *Códice de los alfareros de Cuauhtitlan* is deposited in the Bibliothèque Nationale de France, in Paris, where it is cataloged as *Codex Mexicain* No. 109 of the Aubin-Goupil collection.

Mexico, although focused on pre-Hispanic remains, also briefly documented evidences and materials of the contact period.

Thanks to all these explorations, there are available several collections of colonial ceramics, although they are not as large and representative as pre-Hispanic collections. Also they are less studied and understood than pre-Hispanic ceramics. Nevertheless, the existing assemblages of post-conquest ceramics from the valley of Mexico permit us to obtain insights into their technology of manufacture. These ceramics are, however, in several aspects problematic. Archeological materials from sealed deposits corresponding to the period of contact are scarce; and the same is the case for deposits associated to short intervals of time between 1521 and 1650 (Charlton *et al.* 2005:55). For this reason, it is difficult to define a chronological sequence for the early colonial period based on ceramics. Most archeological materials come from construction fills throughout the city, which as a rule are mixed due to intensive building activity during the five hundred years after the conquest. Also the sampling of ceramics is irregular. While some parts of the valley are well represented—such as *La Traza*—other peripheral or more rural locations are not documented. Moreover, most of the study of colonial ceramics has concentrated on Spanish-style vessels, such as Majolica wares, as they are easy to associate to short intervals of time according to their painted decoration (e.g., Fournier 1990; Lister and Lister 1978, 1982; López Cervantes 1976; Rodríguez Alegría 2003). There have been detailed studies of indigenous-style ceramics (e.g., Charlton *et al.* 1995, 2005, 2007; Fournier 1997), though they have given more attention to decorated ceramics. In fact, common plain wares as well as simple glazed wares for domestic purposes are difficult to date as they appear during the whole colonial period and continue to the present time. Also they seem to present little variation in morphology or surface finishing through time, and decoration—the aspect of ceramics that can be easily and rapidly changed—is often not present. In addition, it is not valid to directly correlate indigenous-style ceramics with indigenous users, nor Spanish-style ceramics with Spanish users, as we know at the present that the patterns of distribution of those ceramic traditions were more complex (see Rodríguez Alegría 2005). Also we began to recognize that urban and rural contexts in the valley of Mexico had di

genous-style ceramics had several changes in the first colonial decades and coexisted with Spanish-style ceramics, in rural settlements vessels

changed at a much lower rate and Spanish-style ceramics were scarce (see Charlton *et al.* 2005).

The direct association of a particular ceramic style with a particular culture is in my opinion always problematic, as the use of material culture is often determined by economic and social factors rather than by ethnic or cultural affiliation. Certainly economic, social and cultural aspects are associated but there are often exceptions. In colonial situations such as the case of Mesoamerica this can be even more problematic given that colonial society was heterogeneous; it was conformed by more social groups than solely the indigenous peoples and the Spaniards. Also material culture became an important marker of the users' social and economic place in the new society, rather than of cultural affiliation. For example, indigenous caciques in the Mixtec area (Lind 1987:111-112) and native traders in the Soconusco region (Gasco 1992) used Spanish-style objects, while in houses of the Spanish sector of Mexico City—*La Traza*—have been found ceramics of indigenous-style, such as Red Wares (Rodríguez Alegría 2005). Thus, the polar separation between indigenous-style and Spanish-style ceramics does not reflect the social complexity of the colonial society at that time, and probably also does not reflect the situation of the pottery technology. This will be explored in this chapter.

In other regions outside the valley of Mexico colonial contexts and ceramics have been much less explored. For the valley of Puebla-Tlaxcala, there have been a few brief studies of colonial ceramics, considering both indigenous and Spanish-style vessels, coming from brief rescue excavations in colonial locations in the city of Puebla (Hernández 2000a, 2000b; Hernández and Reynoso 1999) and Cholula (Sáenz 2004). Also Florencia Müller (1981) made a description of the colonial pottery recovered in a large-scale surface survey conducted in Tlaxcala and parts of Puebla during the 1970s. She also made a brief revision of colonial materials from Cholula (Müller 1973). However, archaeological projects focused on colonial contexts that also include detailed study and publication of ceramics, have not been conducted in this region to date. For the valley of Morelos the situation is similar. To my knowledge, only one restoration project has also included collection and study of colonial ceramics, and has made the information available. It is the conservation of the palace of Cortés in Cuernavaca (Charlton *et al.* 1987). Also detailed archaeological investigations of colonial contexts in the valley of Toluca have not been published. Therefore, the study of indigenous ceramics from the colonial period

in central Mexico has been mainly focused on the valley of Mexico. This is also the case in this study. Data from other regions complement the information from the valley.

Thus the majority of knowledge on indigenous colonial ceramics is based on archeological research, in particular on the study of the ceramic remains themselves. In the present work the documentation of the different manufacturing stages of indigenous-style ceramics during the colonial period are in major part based on consultation of archeological collections from numerous contexts in Mexico City deposited in the *Departamento de Colecciones Comparativas* (known also as *Ceramoteca*) at INAH in Mexico City. These collections consist of selected samples of diagnostic ceramics found in colonial locations all through the city. Some locations with large collections of indigenous and Spanish-style ceramics were: Casa del Marqués del Apartado excavated by Elsa Hernández Pons in 1984-1987; Casa Limón No. 16 excavated by Octavio Corona Paredes in 1987-1990; Real Seminario de Minería, excavated by Arturo Guevara Sánchez in 1989; ex-convento de San Jerónimo excavated in 1994; ex-convento de Bethlemitas, excavated in 1993-1995 and 1998; San Idelfonso; Bancomer, Coyoacán, studied by Silvia Mesa Dávila; Plaza Banamex; Complejo Hidalgo, excavated by Francisco González Rul in 1979-1981; Catedral Metropolitana, ceramics studied by Constanza Vega Sosa in 1975-1976, and Garibaldi, explored in 1973. These collections were samples of the most representative ceramics found in the places explored. The size and variety of the samples did not respond to any statistical principle and do not provide clues on the total amount and variety of the ceramics excavated in every location. The archaeologists who made them only wanted to show illustrative examples to locate in time and space the collection. In addition, for most of these explorations and analysis of materials, reports are not available. Therefore we do not have information on the specific context of deposition. In spite of these restrictions, those ceramic collections represent a wide and varied sample of the pottery made and used in the city during the colonial period. Thus, they are useful to explore the technology of manufacture. For the present study, these samples were consulted in order to obtain indications on method of forming, firing technology, surface finishing, decoration and morphology of colonial ceramics. For this reason, quantification of specimens or statistical analysis was not relevant. As the majority of the examples showed temporal diagnostic attributes, that are characteristics of the late pre-Hispanic period, the early colo-

nial period or the late colonial period, it was possible to allocate temporally particular details of the method of manufacture. The consult of those collections was complemented by literature research.

Organization of ceramic production

Documentary information about towns specialized in pottery-making in the valley of Mexico during the early colonial period is scarce. According to Gibson's exhaustive archival research (1964:350), pottery manufacture at that time was characteristic of Huitzilopochco, Azcapotzalco and Xochimilco. The major producer of the valley was the town of Cuauhtitlan, north-west of Mexico City. At the time of the conquest it was located on the shores of Lake Xaltocan. Clay deposits were, and still are at the present time, abundant and visible at the surface. In the annals of Cuauhtitlan it is mentioned that the pottery industry arrived late in the pre-Hispanic period to this town; that is, after it was conquered by Azcapotzalco during the middle part [of the fourteenth century (*Codex Chimalpopoca* 1975:31³). Gibson (1964:350) also comments that there are documentary notices of the seventeenth and eighteenth centuries on the pottery of this town. Thus it seems that the importance of Cuauhtitlan in this industry was maintained at least until the late part of the colonial period.

The study of clay composition of early colonial ceramics by means of neutron activation analysis shows that pottery continued to be produced in different parts of the valley of Mexico. That is, ceramics were made at least in six areas: Teotihuacan valley, Texcoco, Chalco, Zumpango, Cuauhtitlan and Tenochtitlan (Garraty 2006a:220). This technological study also indicates that pottery-making was continued in Otumba (Charlton *et al.* 2008:260). However, the patterns of distribution were apparently modified. The composition of vessel clay suggests that ceramics were distributed more locally within the valley (Charlton *et al.* 2008:263; Garraty 2006a:218). Also it seems that Tenochtitlan was no longer the main producer as was the case during the last pre-Hispanic centuries (Garraty 2006a:226). All this implies that the market system of the Aztec empire collapsed after the conquest. According to Garraty (2006a:222), the distribution of ceramics

³ Paragraph 128 in original manuscript, *Anales de Cuauhtitlan*.

across the valley during the Early colonial period is more similar to that of the Early Aztec period, before the empire came into existence.

For the neighboring regions of the valley of Mexico there is little documentary information on places of ceramic manufacture in early colonial times. Cholula, in the valley of Puebla-Tlaxcala, was a well-known ceramic-making place during late pre-Hispanic times and in the contact period, as Díaz del Castillo mentions (1980:149). However, it seems that in the second part of the sixteenth century pottery-making was no longer a city's renowned activity. Gabriel de Rojas, *corregidor* of the city at that time and author of the meticulous *Relaciones Geográficas* of Cholula, mentions that "... antiguamente, en sola esta ciudad se usaba hacer jarros, ollas, escudillas ..." (Rojas 1985:128). Nevertheless, in his description of the city as it was at the time of writing the *Relación*, in 1581, he did not mention this craft again though he describes in some detail other industries and trades practiced there. This may even suggest that pottery was no longer produced in the city. At present pottery is not produced in this place. Rojas (1985:126) comments that Cholula lost a large part of its population after the epidemics of 1540 and 1576. That is, from the ancient forty thousand inhabitants, the city was reduced to nine thousand full tributaries. Thus it is possible that the enormous population decrease provoked a rupture in the transmission of knowledge and pottery-making disappeared. Still, indigenous-style colonial ceramics were used in the city, such as the red ware common at that time in the valley of Mexico. This kind of pottery was even used in convents and churches as remains of vessels in refuse disposals show (Plunket *et al.* 1994; Sáenz 2004). Ceramics could arrive in the city through its traders and large market, which were regionally well-known as Rojas mentions (1985:144).

Indigenous-style pottery was probably made in domestic workshops, as we do not have any evidence that may suggest the contrary and this is the pattern at the present time. This might imply that the transmission of knowledge was family-based. The *Código de los Alfareros de Cuauhtitlan* suggests that, at least in this town, pottery-making was an activity in which men participated, as the claim is presented by the potters Agustín Vásquez, Andrés Bonifacio and Francisco Hernández. At present when pottery is the most important source of income of a family it is practiced by the family heads; some-

⁴ "In the past, in this city people used to make pitchers, jars, bowls ..." (Rojas 1985:128, my translation).

times only the men but sometimes all the family members (e.g., Engelbrecht 1987:299-314; Papousek 1984:485). In contrast, when pottery only complements the resources obtained by agriculture or other means, it is often practiced mainly by women (e.g., de la Vega 2007). In Cuauhtitlan pottery-making was an important and renowned activity as a reference of Juan Suárez de Peralta (1990:185) in his *Tratado del Descubrimiento de Indias* written in 1589 indicates: “Alonso de Avila [*encomendero* of Cuauhtitlan] invited the marquise to a fine feast ... and then the dinner, which was very well made and very expensive, in which was served with vases that they call *alcarrazas*, and earthenware jars, and these were made in Alonso de Avila’s town in Cuauhtitlan where they made a lot of pottery⁵”. Thus, we can assume that the men who presented the claim to the judge were also active potters. In addition, the manuscript of Cuauhtitlan suggests that in this town pottery had another level of organization outside the family. According to the transcription of Rosanna Woensdregt the document states:

En el pueblo de guavtitlan [?] diez dias del mes de abril de myll e quinientos e sensenta e ocho anos parecieron antemi alonso dsolozo [?] juez de Residencia en este dicho pueblo agustin vazquez e andres bonifacio e francisco hernandes e juan damian alguazil de los olleros deste dicho pueblos e presentaron esta pintura e dixeron que juan suares de per[al]ta [?] alcalde mayor e asydo en este dicho pueblo [?] les mando hazer todos estos jarros e tinajas e alcarrazas desta pintura en el tiempo que fue tal alcalde mayor en est dicho pueblo ... (*Códice de los Alfareros de Cuauhtitlan*).

The document suggests that Juan Damian was *alguazil* of the potters, which may imply that there was an authority representing the craft-people of the town. This could well be possible as Sahagún (1992, IX:516-519) mentions that pre-Hispanic fine crafts such as feather work and lapidary were highly organized, and the artisans had particular feasts, patron gods and temples. It is also possible that the colonial craft guilds established in urban contexts of Mexico, following the model of the European guilds at that time (see Carrera Estampa 1954), had some echo in rural locations such as Cuauhtitlan. However, we do

⁵ “Convidó Alonso de Ávila a la marquesa a una muy brava cena ... y luego la cena, la cual fue muy cumplida y muy costosa, en la que se sirvieron unos vasos, que allá llaman alcarrazas, y unos jarros de barro, y éstos se hicieron en el pueblo de Alonso de Ávila en Cuauhtitlan, que se hace allí mucho barro ...” (Suárez de Peralta 1990:185, my translation).

not have more documentary information about the organization of production of indigenous-style ceramics. Pottery like other craft productions, as Lockhart found (1992:176), did not reach levels of legal action in the *altepētł*. For this reason, they are rarely represented in documents.

We still do not exactly know when the Spanish ceramic technology arrived to Mexico, as this industry is scarcely mentioned in early colonial documentation, and ceramic remains do not offer fine chronological details. It seems that after the conquest the Spanish colonizers wanted to maintain their European eating habits, and for them this implied eating from the same vessels used at home, such as glazed wares and white tin-enameled Majolica wares. In the beginning Spanish ships brought loads of ceramics to the Americas. For example, in the early settlement of La Isabela founded by Columbus in 1493 in the Dominican Republic have been found typical fifteenth century Andalusian service wares, which still evidence Arabic stylistic traits (Deagan and Cruxent 2002:139). After the conquest Spanish ceramics also arrived to Mesoamerica (see Fournier 1996:452; Lister and Lister 1978; Sánchez 1996), but probably not in large quantities and not common vessels as transoceanic transportation was costly and reserved for other basic items such as weapons, wine and oil (Sánchez 1996:128). In addition, after the establishment of the Manila galleon trade in 1573 a few Chinese porcelains arrived in Mexico City (Charlton *et al.* 2005:62; Lister and Lister 1978:10).

In a document sent by Alonso Figueroa, Chantre of Oaxaca, to Charles V in 1529 he states: “Con trabajo e ingenio alcancé el vidriado que no tenían, un plato en que comer sino venía de Castilla”⁶ (cited in López Cervantes 1976:15). However, as he says, wares were still imported from Spain (López Cervantes 1976:15). A few later sources, the *Florentine Codex* (Sahagún 1961, X: 839) [apparently prepared as early as 1547 and completed in 1569 (D’Olwer and Cline 1973:193)], the *Historia Eclesiástica Indiana* (Mendieta 1980 [1571-1596]: 404) and a letter of Viceroy Lorenzo Suárez de Peralta dated in 1583 (Cervantes 1939: I, 18); show that by 1570s-1580s the production of glazed wares was already established in the colony. Thus, the first production of glazed wares in Mesoamerica occurred around 1529 and was well established by the end of 1560s. Mendieta (1980:404) also

⁶ “With work and talent I was able to make glaze, as they did not have a plate to eat if it did not come from Castile” (cited in López Cervantes 1976:15).

mentions that a pottery master from Spain established in the colony. We can infer that he, or other Spanish potters, started a workshop for Spanish-style ceramics, such as Majolica ware, and introduced the potters' wheel. However, it is not clear when the first potters arrived, though the letter sent by Lorenzo Suárez de Peralta in 1583 to the *alcalde* mayor of Michoacan mentions:

... por cuanto por parte de los naturales de la ciudad de Patzcuaro, que son oficiales de hacer platos y escudillas de loza vidriada y otras piezas de barro, me ha sido fecha relación que la justicia de dicha ciudad, proveyó veedores de este oficio para que viesen y visitasen la obra que se hacía, para que siendo tal se pudiese vender y no lo siendo se los quitase y no se vendiese. Y agora estos indios ollereros que no son ni han sido ni pueden ser oficiales de dicho oficio ni lo saben hacer dichos platos mal hechos y de donde se sigue fraude y engaño ... y me pidieron les mandase dar y diese mandamiento para los que son tales oficiales usen el dicho oficio y no los ollereros ...⁷ (*Archivo General de la Nación*, Ramo Indios, Vol. II expedient 718; López Cervantes 1976:15).

This shows that by that time not only the manufacture of glazed ware was well established, but also that indigenous potters were using this technique. However, both the indigenous and the Spanish traditions of ceramics were apparently produced in different workshops. The excavation of a colonial workshop from the end of the sixteenth century and beginning of the seventeenth century in the neighborhood of Santa Maria Cuepopan in Mexico City revealed that only Majolica wares were produced there (Gámez 2003:236). Also the guild regulations of the seventeenth century for Majolica potters of Puebla suggest that they produced only common and fine grade glazed. That is, the fifth statute states:

Que haya de tener separación los tres géneros de loza fina, común y amarilla, que se entiende ollas y cazuelas, y otros vasos, jarros colorados, no pueden hacer loza fina, ni común, menos que habiéndose examinado para ello de forma que cada uno ha de labrar, sólo el género

⁷ "... concerning the inhabitants of the city of Patzcuaro, which are officials in the trade of making glazed ceramic plates and bowls and other objects of clay, it was informed to me that the justice of the mentioned city, provided observers of this trade in order to observe and visit the works made, and in the case they were right they could be sold and if not they could be taken and not sold. And now this indigenous pot makers which are not and were not and cannot be officials in this profession and cannot make those wrong made plates and where fraud and tricks are followed ... and they asked me to give an order for those who are officials could practice this profession and not the pot makers ..." (*Archivo General de la Nación*, Ramo Indios, Vol. II exp. 718, cited in López Cervantes 1976:15).

de que se examinarse, y no otro ninguno, si no es que se comprende todo en su examen⁸ (Novelo 2007:101).

Potters of Spanish-style ceramics also maintained different methods of manufacture, morphology and decoration. That is, they introduced the potter's wheel, which was not used in pre-Hispanic Mesoamerica; the lead and tin-based glaze to decorate ceramics, which was also unknown, and vessel shapes that were not produced before in Mesoamerica, such as particular forms of plates, cups and jars as we will see later. Thus, Spanish-style workshops were specialized in the manufacture of lead glazed vessels, and in particular in the so-called Majolica wares which were very popular at that time in Spain (see Pleguezuelo 1999; Sánchez 1994). These vessels were covered with lead glaze that was whitened and opacified by the addition of tin oxide (Lister and Lister 1982: vii). The first Spanish-style workshops for Majolica ware were established in Mexico City. According to the Listers (1978:22), this occurred around 1530s, considering the morphology and style of the vessels made. Afterwards the production was moved in the 1580s to the city of Puebla, where in the seventeenth century Majolica wares received a great impulse, and new shapes and colorful decorations appeared (see Lister and Lister 1984:87). The production became so significant that Mexican Majolica wares were exported to other Spanish colonies in the Americas (e.g., Duarte and Fernández 1980; Goggin 1968:223).

It seems that during the first generations after the conquest there were not many points of conflict between native and Spanish potters and between native potters and colonial authorities as the notorious scarcity of administrative documents and other written sources related to this topic suggest. The creation of pottery guilds and regulations in the seventeenth century suggests, however, that by the late colonial period Spanish-style workshops were competing with other pottery workshops. It also shows that ceramic-making—in particular the manufacture of Majolica ware—became a better remunerated activity that attracted the attention of colonial authorities, artisans and middlemen.

⁸ “It should be made a separation between the three grades of ware, fine, common and yellow, which is understood as the jars, *cazuelas* and other vases, red pitchers, they cannot made fine or common wares, at least they are examined for this in that way everyone can only produce the grade of ware for which he has been examined, and no other grade at least it is included in his exam” (Novelo 2007:101).

In Mexico guilds and regulations for crafts with Spanish antecedent were early established by the colonial administration (see Carrera Estampa 1954; Castro Gutiérrez 1986; Pérez Toledo 1993). Already in 1525, Mexico City *cabildo* proceedings mention: “Este día los dichos señores ordenaron e mandaron que de aquí adelante ningún oficial que usare su oficio en está cibdad no sean osados de jugar a los bolos ni a la pelota en los días de hacer algo ...”⁹ (Novelo 2007:95). Craft guilds were established in particular sectors of the city, their members were examined and had a hierarchy according to their knowledge and experience, and there were many rules for their work and products (Carrera Estampa 1954). This form of organization gave way to workshops not based on family relations but rather on occupation relations. That is, professionals and apprentices might be contracted in workshops to which they did not have any personal relation. This was a clear contrast to indigenous-style workshops based on the family. Likely this resulted in the fact that the two kinds of workshops developed different forms of personal relations and of knowledge transmission.

Nevertheless, it seems that indigenous-style workshops in Mexico City, at least for some professions, were also organized at corporate level. According to Gibson (1964:399-400), by the end of the sixteenth century some indigenous craft barrios were sufficiently organized to make a common appeal to the Spanish authorities; also among the candle makers procedures of examination and supervision were in operation in 1551. In addition, indigenous craftspeople were organized in *cofradías*, an institution which associated persons of same profession for the cult of the patron saint and for other social and religious purposes. This form of organization had a broad acceptance in indigenous society (Gruzinski 1990) and has been conserved until the present time in some places, even after guilds and regulations disappeared in the eighteenth century (see Castro Gutiérrez 1986).

⁹ “... concerning the inhabitants of the city of Patzcuaro, which are officials in the trade of making glazed ceramic plates and bowls and other objects of clay, it was informed to me that the justice of the mentioned city, provided observers of this trade in order to observe and visit the works made, and in the case they were right they could be sold and if not they could be taken and not sold. And now this indigenous pot makers which are not and were not and cannot be officials in this profession and cannot make those wrong made plates and where fraud and tricks are followed ... and they asked me to give an order for those who are officials could practice this profession and not the pot makers ...” (*Archivo General de la Nación*, Ramo Indios, Vol. II exp. 718, cited in López Cervantes 1976:15).

Several stages of the early colonial process of manufacturing indigenous-style ceramics in central Mexico can be reconstructed from visible manufacturing traces on the vessels and from extant documents. Six stages of the process of ceramic-making will be here approached and compared with the situation in late pre-Hispanic times: (a) clay preparation; (b) vessel forming; (c) vessel surface finishing; (d) firing; (e) decoration, and (f) assembling vessel shapes. Most of this information came from the valley of Mexico as more archeological research on colonial contexts has been conducted in this area than in neighboring regions. For this reason, we will concentrate on the valley and, when possible, complement with available data from other places.

(a) *Clay preparation*

At present we have little information on clay preparation during early colonial times in central Mexico. Therefore we cannot yet resolve if there were differences in clay recipes between late pre-Hispanic and early post-conquest indigenous-style ceramics. The main reason is that most of the Late Aztec and early colonial occupations in the valley were inextricably mingled. Thus it is not easy to distinguish which vessels were manufactured in pre-colonial and which in colonial times. Also vessels decorated in Late Aztec style continued to be made during the first decades after the conquest (see Charlton *et al.* 2005, 2007); thus again, it is not easy to distinguish between pre- and post-conquest manufacture. Nevertheless, observation of vessel fragments from contexts identified as early colonial shows that in general potters continued using the same clay recipes. The clay of vessels made in the valley still contains sand inclusions. Also bigger objects still have a higher percentage of sand than smaller objects, and Red Wares have finer texture than orange vessels for cooking and serving (Charlton *et al.* 2007: 448; Parsons 1966:213). Charlton and colleagues (2007:437) mention that in occasions the clay of colonial orange wares for cooking is a little bit coarser than in pre-Hispanic vessels of the same kind, although in other cases the clay is the same as in Late Aztec times. They have also found that in rural contexts a higher percentage of orange cooking and serving vessels include vegetal fibers in the clay (Charlton *et al.* 2007:436, 440).

The application of lead glaze for decorating vessels was an early Spanish introduction. This technique had a wide acceptance by indigenous potters during the colonial period. As we will see in the section

devoted to surface finishing, it seems it was established in indigenous workshops by the second part of the sixteenth century. At the same time, workshops specialized in Spanish-style ceramics also produced lead glazed wares, as glazed vessels show clear marks of being manufactured with the potter's wheel, which was distinctive of that kind of workshop. The clay of lead glazed wares looks similar to that of late pre-Hispanic Aztec wares; although in occasions the clay of glazed objects is a bit more porous and apparently includes organic materials as temper (Charlton *et al.* 2007:486). At present we do not know if there were differences in clay recipes between lead glazed pots made in indigenous-style workshops and those made in Spanish-style workshops. Nevertheless, it is clear that glaze was added as decoration to indigenous-style vessels, which continued to be manufactured with the same clay recipes as in the past.

As in pre-Hispanic times, we recognize little variation in clay recipes throughout the valley of Mexico. Salt-making vessels, although very scarce after the conquest, are still made with the same distinctive clay mixture with high content of vegetal fibers (Charlton *et al.* 2007:455). An exception to this continuity is a distinctive and somewhat rare assemblage of vessels with red painting and feldspar-inlaid found since the early colonial period in the valley and in some places in neighboring regions such as Cholula and Cuernavaca (Fairbanks 1966). These vessels are similar in surface finishing to pre-Hispanic and colonial Red Wares, but they have in the surface inlaid fragments of feldspar. The clay of these vessels has sand inclusions as was typical in central Mexico. However, the study of the chemical composition of the clay suggests that these vessels were not made with clays from the valley, though it is not yet clear where they were manufactured (Rodríguez Alegría 2002, II: 491).

In Cholula clay recipes for common cooking vessels such as *cazuelas*, *comales* and braziers also seem to continue as in pre-Hispanic times. The observation of ceramics fragments from a refuse disposal in the parish church of San Andrés Cholula dated to the seventeenth and eighteenth centuries suggests that clay was blended, as in early times, with sand and basalt (Sáenz 2004:66). In contrast, lead glazed ceramics evidence two clay recipes; one is similar to the recipe used for non-glazed common cooking vessels, while the other is more compact and has little rounded black inclusions (Sáenz 2004:90). This may

suggest that both kinds of vessels were produced in different workshops, or even in different locations.

In brief, present data suggests that clay recipes continued without evident changes after the conquest, at least in the valley of Mexico. Also some wares decorated with lead glaze were made out of the same clay used to produce cooking and other utilitarian vessels of indigenous tradition. In contrast, Majolica wares made in Mexico City and Puebla used other clay recipes. High quality vessels made in Mexico City, named fine grade Majolica in the guild regulations, were made with compact clay in which no inclusions are recognized with the naked eye. According to Rodríguez Alegría (2002, II: 442), chemical analysis suggests that the clay was a mixture of calcareous clays with clays traditionally used by the Aztecs. Common grade Majolica wares had more granular clay than fine grade wares (Rodríguez Alegría 2002, II: 446).

(b) *Vessel forming*

After the conquest potters of the valley of Mexico continued using the same methods of forming vessels. Remains of indigenous-style ceramics from contexts identified as early colonial show that vessels were made with horizontal molds. Also ceramics of indigenous-style with decorative or morphological traits characteristic of the early colonial period were made with horizontal molds. In the case of *ollas*, juncture marks show that they were made using two or three horizontal molds as in pre-Hispanic times (Figure 11). As in Late Aztec examples, on occasion one mold was used for the lower part of the body and another for the upper part which included the vessel's neck; in other cases two molds were used for the body and a third one for the neck. Also as in early times, bowls were made with one horizontal mold. Red Ware received a great impulse in colonial times; many new shapes and decorations appeared. Nevertheless, manufacturing marks visible on the vessels, such as junctures and differential compaction of the clay, show that they continued to be made with molds.

The first Spanish-style workshops for Majolica ware were established in Mexico City around the 1530s, considering the morphology and style of the earliest Majolicas produced in Mesoamerica (Lister and Lister 1978:22). Likely at the same time was introduced the potter's wheel to form vessels, as this implement was characteristic of that kind of workshops. Mexican Majolica vessels, as well as other vessels



Figure 11. Fragments of *ollas* from the valley of Mexico with juncture marks showing that they were made using two or three horizontal molds as in pre-Hispanic times.

made with the wheel, show the typical attributes associated with throwing, such as spiral rhythmic grooves and ridges on the interior of the base, compression ridges on the interior of the walls, or straight, parallel grit dragmarks on the base (Rye 1981:75). Forming vessels with the centrifugal force of the wheel was the common method for pottery manufacturing at that moment in Spain (Sánchez Cortegana 1994), and it had a long tradition in the old world. It was present in southern Levant as early as the beginning of the 4th millennium BC (Roux 2003:2).

In indigenous-style workshops the potter's wheel was apparently not adopted. We can propose several reasons for this. First, the new method of manufacturing did not represent a technical improvement, as some present-day researchers believe (e.g., Foster 1960:101; Katz 1977:124-25). Some kinds of vessels, such as small bowls and pitchers, could be made faster with the wheel, however, bigger forms such as large *cazuelas* or *ollas* were difficult to make by that method that method. In addition, the connection between particular clay recipes, vessel shapes and methods of manufacture was the result of a vast pottery experience accumulated through generations. Potters could not simply replace the ancient forming method in favor of the wheel without also incorporating important changes in the clay and morphology of the vessels. In addition, the method of forming vessels involved motor habits mastered and internalized by frequent repetition, and also knowledge of the sequence of execution. This knowledge was transmitted across generations but it was a knowledge implicitly remembered. That is, potters might not consciously recognize that they were remembering and transmitting all the bodily skills required for making a pot in the adequate way. This likely resulted in the fact that no explicit efforts were made to modify those abilities. In addition, this process was normally not visible in the final products, and consequently users or other potters did not modify it. Furthermore, this was one of the most difficult parts of the process of manufacturing and required knowledge. In family-based workshops, it was acquired from parents or other older relatives, and as a form of respect to them, this knowledge was maintained. Probably for all these reasons the method of forming was very conservative.

In the early colonial valley of Mexico some lead glazed vessels were made with the wheel while others were made by mold. This can be recognized in the vessels themselves; in particular in common and simple examples for cooking and serving as their surface still has some



Figure 12. Fragments of vessels made by wheel with compression rings on the interior of the walls.

visible marks of the process of forming (fine objects with thick layers of painting or glazing have in contrast covered those marks). Thus, *ollas*, bowls and vases formed with the wheel show a spiral groove across the interior of the base and compression rings on the interior of the walls which are unlikely to be confused with other surface markings (Rye 1981:75) (Figure 12). In contrast, the same kind of vessels made by mold present smoothing marks that tend to be concentric but may also be irregular, which are different to the ridges left by the wheel. *Ollas* also had juncture marks of the mold in the middle of the body and sometimes in the connection between body and neck.

In general vessels with shapes of Spanish origin, such as candle holders, basins (*basines*), oil jars (*botijas*), plates or high narrow drug vases (*albarelos*), were made with the wheel. In contrast, vessels with shapes of indigenous origin, such as *ollas*, *cazuelas* and bowls, were made with molds. This may suggest that these two groups of vessels were made in different workshops. It seems that after the conquest

indigenous-style workshops continued using the same methods of manufacture for producing the known repertoire of vessels. At the same time, Spanish-style workshops for manufacturing Spanish-style vessels used the wheel. Certainly there were exceptions. In the collections of the *Departamento de Colecciones Arqueológicas* there are a few scarce examples of Spanish-style vessel shapes, in particular candle holders and plates, with marks of mold and not of the wheel. The difficulty for recognizing fine temporal distinctions in early colonial contexts in the valley does not permit us to explore in more detail how the dynamics of manufacture of lead glazed vessels all through that period were.

Majolica wares were all made by wheel. Thus as a rule, vessels with Spanish-style shapes were made by wheel. A possible exception is a serving ware present during the sixteenth century in Mexico City decorated with white slip covered with lead glaze, which has the appearance of Majolica although its glaze is not blended with tin. Archeologists call them Indígena Ware (Lister and Lister 1978:19). Observation suggests that these vessels were made with the mold as the typical marks of the wheel are not detectable. However, as slip and glaze have covered large parts of the vessels' surface, it is still necessary to conduct microscopic analysis to confirm this hypothesis. The vessels show Spanish-style shapes, in particular plates and small bowls, but are decorated with motifs both of Spanish and indigenous origin. Chemical analysis of the clay suggests that they were made in Michoacán (Fournier *et al.* 2007).

(c) *Vessel surface finishing*

After the conquest the surface finishing and decoration of indigenous-style vessels manifested notorious changes. We can recognize two major trends. On the one side, serving vessels evidence a great impulse of creativity and innovation. Potters modified parts of the surface finishing and decoration that existed before the conquest, and also experimented with new techniques. This was in particular the case of the Red Wares in which new styles and motifs of decoration are observed. Many of them were not new in pre-Hispanic Mesoamerica but were used for the first time in this kind of vessel. At the same time, the manufacture of other decorated serving wares decreased and was a bit simplified, such as the Black-on-Orange and the polychrome vessels. On the other side, a second trend was that the surface finishing of



Figure 13. Fragments of early colonial Red Wares from the valley of Mexico.

cooking vessels and other utilitarian artifacts was simplified while a new technique—the lead glaze—became quite popular.

Potters dedicated to the manufacture of Red Wares had notorious creative impulses during early colonial times. They innovated and experimented with surface finishing, decoration and shapes (Figure 13). At present we have a relative good knowledge of the colonial expression of these kinds of vessels as they are common in many contexts from that time in the valley of Mexico and neighboring regions (see Cervantes *et al.* 2007; Charlton 1996; Charlton *et al.* 1987; Fournier 1996; Plunket *et al.* 1994). Also archeological explorations in Tlatelolco, the largest market in Tenochtitlan/Mexico City, obtained a large sample of colonial Red Wares and they have been studied and published (Charlton *et al.* 1995; Fournier 1997). These ceramics evidence a variety of new ways of surface finishing and decoration after the conquest. For example, the red slip began to be decorated with differential polishing and zonal painting applied on specific zones of the

vessel while some parts were only smoothed (Charlton *et al.* 1995:143). This method of decoration was used in pre-Hispanic times but it became more complex and frequent after the conquest. Also decoration using stamping and incrustations was new (Charlton *et al.* 1995:143-44; Fairbanks 1966). Although these decorative techniques were well known in pre-Hispanic Mesoamerica, they were as a rule not used in Red Wares. In addition, colonial red vessels were longer burnished, and consequently had a more lustrous appearance. Also colonial wares were burnished in different directions while pre-Hispanic wares were more regularly and horizontally burnished. This implies that not only did new decorations emerge but also new methods of working. There were also innovations in decorative motifs; that is, colonial red vessels with black decoration had thicker lines than their pre-Hispanic antecedents. Also colonial vessels incorporated well-known Mesoamerican motifs not used before in this kind of ceramics, as well as elements inspired by the European decorative tradition. The black painting itself changed. After the conquest shimmering mineral black painting, similar to graphite, became more frequent. Further, there were modifications in the distribution of decoration in the vessel's space. In pre-Hispanic Red Wares decoration was placed on interior and exterior sides while in colonial times it was more frequent on the interior, even when vessels had closed shapes such as hemispherical bowls. Also red vessels with black and white decoration became less frequent after the conquest. It seems that the fugitive matte white painting was no longer preferred by potters and users.

In contrast to the great creativity associated to Red Wares, other decorated serving vessels manifested less innovation in early colonial times. Also their production was reduced, and ultimately disappeared roughly a hundred years after the conquest (see Charlton *et al.* 2005; Garraty 2006b:368). The most characteristic Late Aztec decorated wares, the Black-on-Orange vessels, continued after the conquest. However it seems that at least in some parts of the valley potters modified the method of finishing their surface. Charlton and colleagues (2007:440) observed in rural settlements in Otumba that after the conquest more vessels were finished with a reddish slip instead as with burnishing. This modification seems to be a simplification in the manufacturing process as burnishing is more time-consuming than slip application. In addition, Black-on-Orange vessels incorporated new decorative motifs (Figure 14). Some of them were not new, but were in the past exclusive of other kinds of vessels, such as the Red Wares.



Figure 14. Fragments of early colonial Black-on-Orange wares from the valley of Mexico.

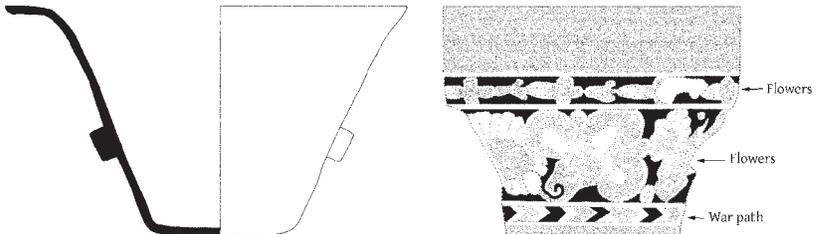


Figure 15. Early colonial fine polychrome vessel with pictographic decoration from Cholula.

Other motifs were apparently inspired by the decorative traditions introduced by the Spaniards.

Also the fine polychrome wares from Cholula changed after the conquest and disappeared at the end of the early colonial period (Lind 1994:81). Although the few extant colonial examples of these ceramics do not permit detailed insights into the modification of their decoration, we can recognize a few trends. Motifs clearly associated to pre-Hispanic religion and ritual practices seem to disappear in colonial times. Decoration incorporated some motifs and styles of representation of the European tradition (Figure 15). At the same time, the high quality and gloss of the surface characteristic of pre-Hispanic vessels was maintained.

Cooking vessels such as *ollas*, *cazuelas* and *comales* continued to be made after the conquest, however, their surface finishing was a little modified. Potters increased the application of a reddish slip. At the same time they reduced burnishing, and the consequence was that vessels look more matte. This was evidenced both in rural and urban contexts of the valley, and for this reason, some scholars have suggested that it implied deterioration of the pottery tradition (Charlton *et al.* 2007:436, 437). Nevertheless, when the whole panorama of colonial pottery is considered, it seems that these changes were related to the introduction of lead glazing. The glaze technique consisted of the application of a mixture of lead oxide, silicate and clay to the surface of a fired vessel (Charlton *et al.* 2007:485-486). After that, the vessel was fired again at high temperature; and the glaze material melted and fused to the surface, obtaining a physical structure similar to glass (Rye 1981:44). The result was a glossy vessel with brownish or greenish glaze.

The application of lead glaze for decorating vessels was an early Spanish introduction. It seems that this technique had a good acceptance by native potters and was established in indigenous-workshops by the second part of the sixteenth century. Sahagún (1961, X: 839) in his description of potters and the pottery craft mentioned that they made a variety of pre-Hispanic wares but also glazed vessels. This reference could date the establishment of this technique among native potters between 1547 and 1569, when the production of the *Floretine Codex* is estimated (D'Olwer and Cline 1973:193), although it could occur earlier. Unfortunately the morphology and archaeological context of indigenous-style glazed vessels do not provide more chronological detail. For example, in several places of the valley of Mexico



Figure 16. Fragments of early colonial *molcajetes* with lead glaze from the valley of Mexico.

have been found typical pre-Hispanic vessels with lead glaze, specifically *molcajetes* (Figure 16). These objects are dated for the early colonial period (AD 1521-1620), according to their morphology and context (Charlton *et al.* 2007:486); however we are not yet able to date them with more precision. *Molcajetes* often present a brown glaze with light greenish spots or even a glaze almost entirely light green. This kind of greenish coloration suggests that vessels were fairly over fired and that the kiln did not have enough air (Rye 1981:110-119); both aspects suggest that potters were in the process of experimenting and learning this technique. *Molcajetes* were clearly for indigenous users. Their function as grinders for chilli sauces was pre-Hispanic; also their shape and decoration were distinctively pre-Hispanic. In addition, other kinds of indigenous-style vessels were also glazed, like *ollas* and *cazuelas*.

Lead glaze as surface finishing required different types of effort and energy than the typical pre-Hispanic surface treatments. These vessels did not require finishing the surface with detailed burnishing, as the glaze covered most of the previous process of finishing. However these vessels required two firings and higher temperatures, and therefore a larger amount of fuel. Even with the higher efforts this involved,

indigenous-style workshops implemented this technique, as is evidenced by the presence of glazed vessels with indigenous-style forming methods and morphology. Although the glaze notably altered the appearance of these vessels, it was relatively easy to implement without modifying other parts of the process of manufacture (with the exception of firing). The fact that this technique was not only implemented in serving wares that are normally those in which potters' influences are reflected, but also in cooking wares, shows that lead glaze had an important impact in the indigenous pottery. This was not exceptional, however; Mesoamerican potters had always been open to new forms of surface finishing and decoration as the variety of pre-Hispanic vessel repertoires in different epochs and regions show.

In contrast, the Majolica technique was apparently not adopted in indigenous-style workshops. It consisted in the application on a fired vessel of a mixture of tin, lead and silicate, and decorative motifs painted with metallic oxides; after a second firing the vessel acquired a white milky glaze and decorative patterns in various colors (see Lister and Lister 1982). In late colonial Mexico the guild regulations permitted the manufacture of fine grade Majolica, which had a higher concentration of tin in the glaze and therefore had a whiter appearance and was also more carefully fired, and the common grade Majolica, with less tin and less care during firing (see regulations in López Cervantes 1976:15). Some specialists consider Indígena Ware (vessels with white matte slip covered by lead glaze) as indigenous imitations of Majolica ware (Charlton *et al.* 2007:470-71; Lister and Lister 1978:21). However we do not yet have enough data to confirm that it was made by indigenous potters or in indigenous-style workshops.

In brief, potters implemented many changes in vessels' surface finishing after the conquest. The new colonial culture apparently influenced to a large extent the decorative preferences of potters and consumers. Red Wares became the favorite among indigenous-style ceramics, not only in the valley but also in neighboring places such as Cholula and Cuernavaca (Charlton *et al.* 1995:150; Fairbanks 1966; Müller 1973:98; Plunket *et al.* 1994). It also seems that they were preferred by various sectors of colonial society, as they have been found, for example, in Tlatelolco, which remained an indigenous sector of Mexico City in colonial times (Fournier 1996), in houses in *La Traza* in Mexico City (Rodríguez Alegría 2005), in the palace of Cortés in Cuernavaca (Charlton *et al.* 1995:150) and in the Franciscan convent of San Gabriel in Cholula (Plunket *et al.* 1994). The colonial popularity

of this ware contrasts with the decrease of Black-on-Orange wares, as well as with the reduction of polychrome vessels; those which were in pre-Hispanic times highly appreciated. Both wares disappeared around the end of the early colonial period (Charlton *et al.* 2007:439-442; Lind 1994:81). However we cannot yet date these events with more precision as we do not have enough temporal detail for contexts of the late sixteenth and seventeenth centuries. In my opinion the disappearance of these wares was related to the introduction of the glazing technique.

(d) *Firing*

The methods for firing indigenous-style vessels seem to be maintained after the conquest. Although pre- and post-conquest evidences for pottery workshops and firing technology are scarce, we know that in Tula, potters were firing their vessels in two-chamber updraft kilns, pit kilns and open firing at least from the tenth to the twelfth centuries (Hernández *et al.* 1999). Similar kilns were also employed in central Veracruz during the Classic period (Pool 1997). For other regions of central Mexico we do not have comparable data yet, so we do not know how extended the use of pottery kilns in late pre-Hispanic times was. Nevertheless, it is probable that two-chamber kilns such as those of Tula were also used in other pottery-making towns. These facilities were clearly visible in the workshop and their implementation had evident effects on the production, such as the possibility to achieve temperatures in the range of 1000 to 1300°C, the control of the atmosphere of firing and the rate of temperature rise (Rye 1981:98). Therefore, potters' neighbors, clients and visitants could easily observe this kind of kiln, recognize its value, understand its function and reproduce it in other workshops, even in far places considering that the interregional exchange of ceramics and ideas was quite extensive in late pre-Hispanic times. Similar kilns were used at that time in Spain and had a large tradition in the old world. Greek, Roman and other Mediterranean pottery, and Arabic glazed ware were fired in updraft kilns (Rye 1981:100).

Early colonial ceramic remains from the valley of Mexico and neighboring regions suggest that indigenous potters continued firing their vessels in similar conditions after the conquest. That is, early colonial Red Wares were still fired with a relatively low temperature as was the case in earlier times. Evidence for this is the high frequency of

vessel fragments with dark clay cores and firing clouds. Orange wares, however, seem to be fired at fairly lower temperatures than in pre-Hispanic times. This can be recognized in that Black-on-Orange serving vessels were less hard and had less metallic sound than before, and that orange cooking wares often had darker surfaces and clay cores (Charlton *et al.* 2007:440, 436). According to Charlton and colleagues (2007:440, 436), the increase in the use of red slip for these vessels during the early colonial period might be related to the changes in vessel appearance as a consequence of lower firing temperatures. This gives the impression that the process of manufacture of orange wares was to some extent simplified after the conquest. In my opinion, one of the reasons might be the predilection for lead glaze.

Lead glazed vessels had to be fired twice and the second firing required higher temperatures. Vitrification can begin at about 700°C, but generally does not become extensive below 900-950°C (Rye 1981:108). Such a temperature could be well reached in kilns such as the two-chamber updraft kilns from Tula. This kind of facility was more convenient to fire glazed wares than open fires as it could reach and maintain higher temperatures (Rye 1981:98). However archaeological remains of colonial kilns are to my knowledge very scarce (e.g., Gámez 2003:237), so we cannot recognize if the expansion of lead glazed ware production in central Mexico was accompanied by the expansion of this kind of kiln. Certainly an effect of glaze ware manufacturing was the environmental impact. These ceramics required more fuel than non-glazed indigenous-style ceramics as they were fired twice.

Majolica wares were also fired twice. An important aspect of that process was the separation of vessels in the firebox in order to avoid that they stuck and melted together. Potters used for this purpose cockspurs with three support struts to separate common Majolica, while fine grade Majolica was placed in *saggars*, ceramic boxes in which triangular pegs were used to hang the pieces upright (Lister and Lister 1978:12). Among the remains of a colonial Majolica workshop excavated in Mexico City all these implements were found (Gámez 2003:237). The lack of scars left by pegs or *saggars* or by the separation of pieces melted together was one of the main criteria to distinguish between fine and common Majolica (see *Ordenanzas* in López Cervantes 1976:15). It seems that in the case of lead glazed ceramics such firing imperfections were not so relevant. Lead glazed vessels, both of indigenous-style as well as Spanish-style often had firing scars.

(e) *Decoration*

After the conquest the form and content of decoration on ceramics, and even the function of decoration itself had changes. Potters embellished their vessels with new motifs and new stylistic patterns, but also incorporated in certain wares well-known elements and designs that in the past were exclusive of other wares. This was in part a result of the new ideas produced by the encounter between indigenous and Spanish culture. Possibly this was also a consequence of the end of the centralized market system during the Aztec empire. That is, Hodge and Minc (1990:426-433) have identified that ceramics of the valley of Mexico in the Late Aztec period -in imperial times- had less variability in comparison to the Early Aztec period. They propose that this was because goods were distributed through a geographically widespread exchange system, creating a higher degree of similarity in artifacts through the region. After the conquest the distribution of ceramics across the valley is more similar to that of the Early Aztec period (Garraty 2006a:222), when potters and consumers have access to several independent exchange centers as the higher variability of ceramics suggests (Hodge and Minc 1990:426-433).

The various decorated wares for serving had different dynamics of change during early colonial times. Black-on-Orange vessels incorporated a variety of new decorative motifs. In contrast, Red Wares do not show much innovation in motifs, rather than in decorative techniques. Besides, in the fine polychrome ceramics some of the earlier pictographic motifs with clear religious connotations (see Hernández 2005) disappeared. My impression is that meaningful decorative elements were less frequent, which suggests that painted ceramics were less used as media of visual communication in the early colonial society. This remains impression however; as the extant collections of late pre-Hispanic and early colonial polychrome vessels from central Mexico cannot be well compared. That is, fine polychrome vessels from undisputed colonial contexts are very scarce. Also many of the known examples are identified as colonial only due to morphology (they present forms typical of other colonial vessels such as small bowls with basal rings).

Early colonial Black-on-Orange serving wares manifested several changes. The typical Late Aztec bands of lines and motifs on vessel walls were simplified, lines became thicker and new configurations of elements appeared (Whalen and Parsons 1982:450). Also colonial

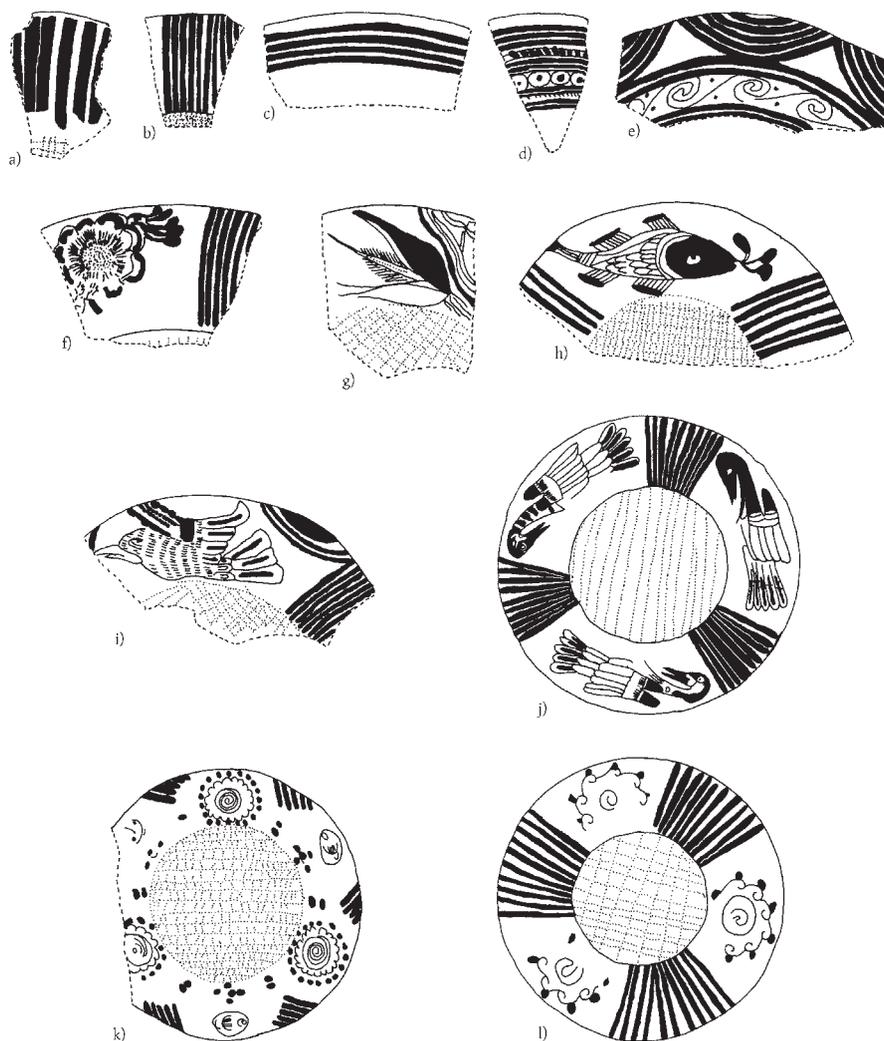


Figure 17. Patterns of decoration on early colonial Black-on-Orange wares from the valley of Mexico: (a, b, c, d) *molcajetes* and tripod bowls (based on Charlton *et al.* 2007: Fig. 12) (e, f, g, k) *molcajetes* and tripod bowls (based on Charlton *et al.* 2007: Fig. 13) and (h, i, j, l) *molcajetes* (based on Charlton *et al.* 2007: Fig. 14).

Black-on-Orange vessels were often decorated with groups of vertical lines on their interior walls, a composition exclusive of Red Wares in pre-Hispanic times (see Blanton and Parsons 1971:299). In addition, colonial vessels were often decorated with figurative motifs (Figure 17). These motifs were often iconic, such as birds, fishes, flowers and leaves, and had a new style of representation (see Charlton *et al.* 2007:Figs. 13-17; Vega 1975:60, 61). That is, flowers were often painted in profile (pre-Hispanic flowers were often depicted frontal) and birds were fully represented (pre-Hispanic birds only the head). Also, these images had a few indications of depth. Some scholars have suggested that they were derived from the European decorative tradition (Noguera 1934:272; Whalen and Parsons 1982: 450). However, flowers and birds were typical signs of the central Mexican system of visual representation during late pre-Hispanic times. Leaves and fishes were also known images although they were not often depicted (see Hernández 2005). Thus the innovation was that these motifs became more frequent after the conquest and their style was a bit modified. This might be inspired by the colonial world as these elements were also common in Spanish decorative traditions (see Lister and Lister 1987). Not all signs on orange vessels were new, however; potters still painted some motifs present in this ware since the Early Aztec period such as stepped frets, precious stones and water volutes (see Charlton *et al.* 2007:Figs. 13, 15, 17). All these modifications of the decoration on orange wares have been identified in both urban and rural ceramics (Charlton *et al.* 2007:439-441), which suggests the new stylistic trends were widespread in the valley of Mexico.

Red Wares incorporated new painted motifs but the most visible innovations were on the treatment of the surface. It seems that potters preferred to embellish those vessels with red slip and a variety of surface finishing such as modelling, differential polishing (see Figure 13), stamping or incrustations, rather than with painted decoration. Nevertheless, on occasion vessels were also painted with black motifs of pre-Hispanic origin, like circles, stepped frets, cut snails and spirals (Charlton *et al.* 1995:144-148). Although these elements were well-known in pre-Hispanic times, they were rarely present in Late Aztec Red Wares. This suggests a easing of stylistic conventions in ceramics after the conquest. Also colonial Red Wares included a few new motifs, like flowers and leaves, painted in similar style as on Black-on-Orange wares, that is, in profile, with full body and with some indications of depth (Figure 18). In addition, in some pieces were painted bands of

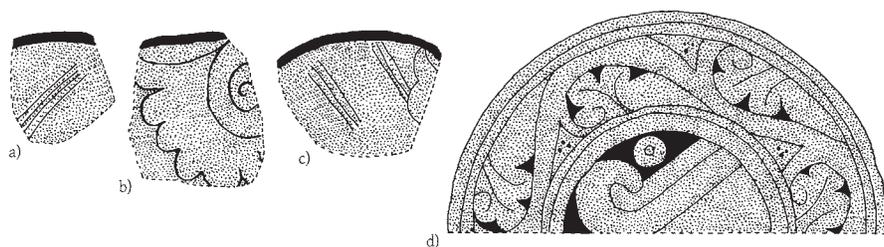


Figure 18. Patterns of decoration on early colonial Red Wares from the valley of Mexico: (a, b) bowls with flared walls (based on Charlton *et al.* 1995: Fig. 6) (c) bowl with upright walls (based on Charlton *et al.* 1995: Fig. 5) (d) plate with interior decoration (based on Charlton *et al.* 1995: Fig. 8).

curvilinear motifs relatively similar to designs painted on the so-called Indígena Wares (see Charlton *et al.* 2007: Fig.49), the vessels with white slip and lead glaze that might be imitations of Majolica. The decoration on those red vessels, consisting of patterns of volutes and other curvilinear elements, had as well some resemblance to the decoration of early colonial Majolica wares from Mexico and Europe (see Lister and Lister 1987). The style of these new ceramics was probably a source of ideas for indigenous potters.

The fine and colorful vessels decorated with pictographic motifs also saw changes after the conquest. Although these ceramics are scarce in collections from early colonial contexts in the valley of Mexico and the extant examples are highly fragmented, we can recognize a few details. In vessel sherds found in colonial deposits at the Templo Mayor, and on objects without detailed provenance but with morphology typical of the early colonial period, we observe that decoration became more mundane. That is, colonial vessels were no longer painted with signs of evident religious and ritual associations. For example, agave thorns and bone awls, well-known pre-Hispanic sacrificial instruments and frequently depicted on earlier vessels, no longer appear on colonial period ones. Also other ritual implements or images and symbols of gods are absent. In contrast, flowers and birds became frequent (see Figure 15). Although these motifs were also part of the late pre-Hispanic pictographic corpus (see Hernández 2005) and had important meanings in ancient religious and ritual contexts (see Anders and Jansen 1993:120; Dibble 1971:324; Nowotny 1961:38; Seler 1963, I:47, 156), they were apparently less obvious for outsiders, and also had other connotations in the new colonial society. On other early colonial vessels these two signs were frequent as well. In addition,



Figure 19. Patterns of decoration on early colonial lead glazed wares from the valley of Mexico.

the pictography on colonial polychrome wares was simpler and less varied. The fact that the thematic of pictographic short texts on vessels became more mundane and simple, suggests that after the conquest these vessels continued being special objects for special occasions, but their use in religious contexts disappeared. It also seems that the function of these vessels as media for transmitting concepts associated to the context in which they were used became less important. These vessels disappeared at the end of the early colonial period (Lind 1994:81). Potters and users preferred other indigenous-style ceramics, in particular Red Wares, which were sometimes painted but their motifs neither constituted pictographic texts nor conveyed complex meanings. Thus, the disappearance of fine polychrome wares also implied the end of the tradition of ceramics as media for writing.

On occasion lead glazed vessels were decorated. The decoration consisted of stamping, incisions and applications made before the first firing; after that, the vessel was covered with glaze and fired for a second time (Figure 19). Motifs were simple, usually incised lines combined with flowers made through stamping or application. Some

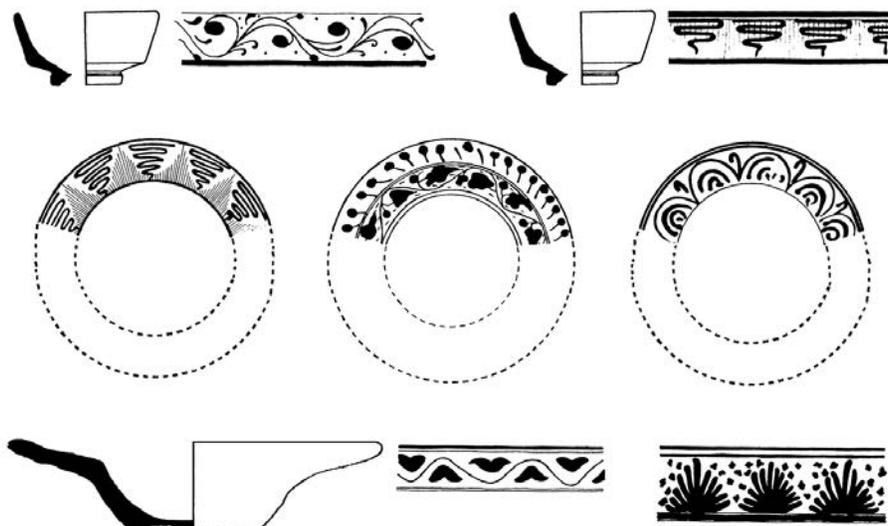


Figure 20. Patterns of decoration on early colonial Majolica wares from the valley of Mexico (based on Lister and Lister 1987: Fig. 85).

incised decorations were similar to patterns of lines characteristic of Late Aztec and early colonial Black-on-Orange vessels (see Charlton *et al.* 2007: Figs. 10, 12 and 13). This suggests once more the easing of stylistic conventions. Following the Spanish tradition (see Lister and Lister 1987), Majolica wares made in Mexico were decorated with bands of curvilinear and geometric motifs painted in several colors, mainly blue, yellow and orange (Figure 20). Compositions were similar to those of the Majolica produced at that time in workshops around Seville (see Charlton *et al.* 2007; Lister and Lister 1978, 1982, 1987). In Mexico City there were also a few decorated vessels imported from Spain, Italy and China (Charlton *et al.* 2007:481-485; Fournier 1990; Lister and Lister 1978). Potters specialized in indigenous-style vessels incorporated in the Red Wares a few elements of these new ceramics. However, indigenous and Spanish decorative traditions were maintained separate until the disappearance of Black-on-Orange wares and polychrome wares at the end of the early colonial period. Red Wares continued to be made in the late colonial period but their decoration was increasingly different to that of earlier times. Also other decorated

wares of indigenous-style appeared in later times, for example, the Tonalá Ware, produced in that town close to Guadalajara after 1650 (Charlton and Katz 1979), and widely traded in central Mexico. The function of decoration in Majolica Wares was to embellish vessels, not to convey visual information in the form of short texts as was the case of polychrome wares decorated with pictography (Hernández 2005, 2010). In colonial ceramics of indigenous-style the function of decoration also became more focused on the aesthetic value rather than on conveying ritual or other important meanings.

(f) *Assembling vessel shapes*

After the conquest the indigenous vessels' repertoire had several modifications. Potters did not make drastic changes in the existing inventory of ceramics but were creative and innovative in formal details. For example, new kinds of supports appeared. Also a number of new shapes were incorporated. Many of these shapes were not really new, however. They were not manufactured in the last centuries before the conquest but they were present in earlier times. A few vessel shapes were in fact new; in particular in the inventory of Red Wares for serving. However in many cases those new shapes replaced shapes of similar function. Only very few vessels were created for new uses, like *candeleros* (candle holders). In addition, a few ritual vessel types continued to be made after the conquest although they were no longer manufactured by the end of the early colonial period.

In early colonial times common vessels for cooking, transporting and storing continued to be *ollas*, *cazuelas* and *comales*. Their basic shape was maintained as in pre-Hispanic times, although minor formal details were modified, such as the shape of the rim or the inclination of the walls (Charlton *et al.* 2007:436). Also fragments of these vessels suggest that their dimensions were maintained. The shape of *ollas* and *cazuelas* finished with burnishing was similar to those finished with lead glaze, suggesting that the main difference between glazed and non-glazed containers was decorative rather than functional. Vessels for serving food and drinks were comparatively more modified after the conquest. As in Late Aztec times, colonial Black-on-Orange wares and Red Wares had different vessel shapes and different stylistic developments. The basic shape repertoire of these wares

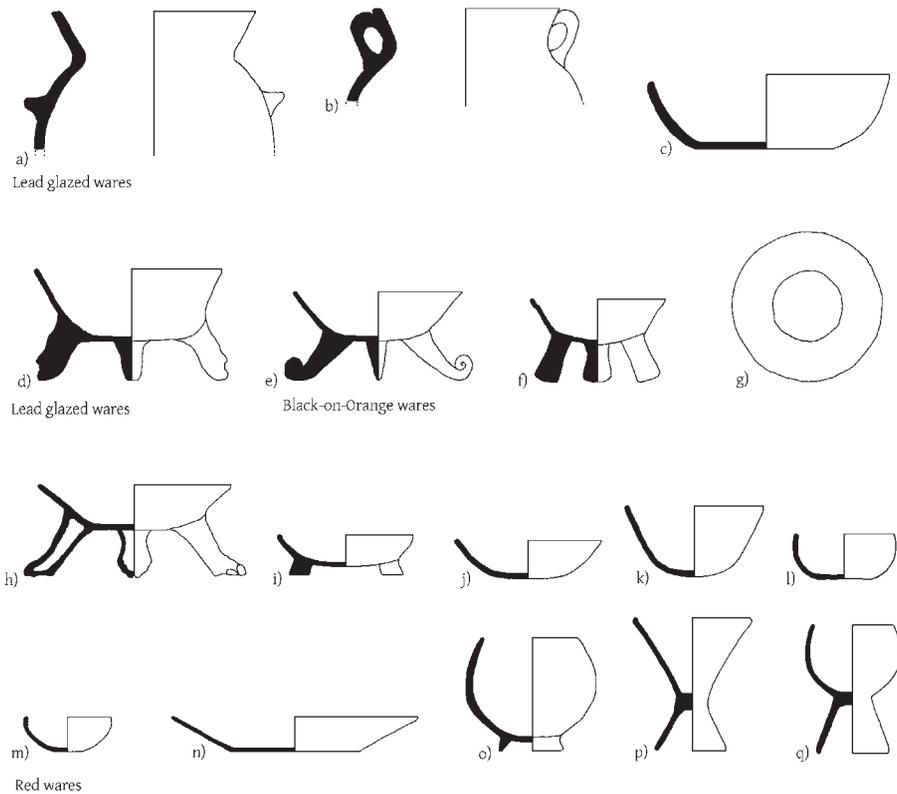


Figure 21. Shapes of early colonial serving vessels from the valley of Mexico: (a, b) *ollas* (based on Charlton *et al.* 2007: Fig. 68) (c) hemispherical bowl (based on Charlton *et al.* 2007: Fig. 69) (d) tripod *molcajete* (based on Charlton *et al.* 2007: Fig. 66) (e, f) tripod bowls (based on Charlton *et al.* 2007: Fig. 15) (g) plate (h, i) tripod bowls (based on Charlton *et al.* 2007: Fig. 23 Rodríguez Alegría 2002: Fig. A.1) (j, k, l, m) bowls (n) plate (o, p, q) goblets (based on Charlton *et al.* 2007: Fig. 26; Rodríguez Alegría 2002: Fig. A.1).

continued but it seems that certain vessels shapes became more frequent (Figure 21).

Colonial Black-on-Orange wares maintained the typical pre-Hispanic shapes such as bowls with upright or flared walls, tripod bowls, dishes, plates, hemispherical bowls and pitchers (Charlton *et al.* 2007:436-452), although it seems that the popularity of certain vessels changed. Tripod *molcajetes* became more frequent than in earlier times; also the scarce hemispherical bowls with ring base became a bit more common (Charlton *et al.* 2007:438-439). The most evident

innovation was related to the supports of tripod vessels. Supports in late pre-Hispanic bowls could be solid conical, hollow cylindrical or wide thin slabs (Blanton and Parsons 1971:304-309; Whalen and Parson 1982:441). After the conquest potters continued manufacturing these supports but also incorporated examples modeled in the form of butterfly antennae, eagle heads, duck heads, bird claws, deer and pig hoofs, lion claws or old men's faces (Charlton *et al.* 2007:442). Some of this variety of forms were used in pre-Hispanic times but were exclusive of other wares, such as the polychrome vessels with pictographic decoration used in Cholula (see Lind 1994:92). Other supports were inspired by colonial animals, like the pig hoofs and lion claws.

Early colonial Red Wares had notably more morphological innovations than Black-on-Orange wares. The *Códice de los Alfareros de Cuauhtitlan* offers excellent insights into the kinds of vessels made in 1564 and their nomenclature, at least in that town. The variety of vessel shapes illustrated in the codex is surprising as several of them are rarely represented in the archeological record (Figure 22). The document shows a list of vessels paid and not paid for by the *alcalde mayor* Juan Xuares de Peralta. Paid vessels were painted on the left side of the manuscript with red color while unpaid vessels were represented on the right side, but were only delineated and without color. This gives the impression that all pieces represented were Red Wares although this is not confirmed in the text. Even if they were not Red Wares, this document evidences the kind of vessels made at that time in one of the most important pottery towns of the valley of Mexico. The collection includes vessels with pre-Hispanic antecedent, Spanish antecedent and new shapes. Among the vessels with pre-colonial origin we recognize vessels named by them as *molcaxetes*, *alcarrazas* (jars with globular body, lateral handles and ring base), *jarros* (pitchers with ring base), and other shapes not named such as goblets with grooved walls and bowls with stamped designs on their bottom. *Molcaxetes* were illustrated in association with a brief Spanish text indicating that they were *molcaxetes para cacao*s, and therefore they had a different function than the orange *molcaxetes* for grinding sauces. All these vessels had pre-Hispanic antecedents, although in that particular form they were not common in Late Aztec Red Ware collections (see Cervantes and Fournier 1995; Cervantes *et al.* 2007). They look like elaborate versions of pre-Hispanic shapes; for example, the body is modeled with grooving (to form grooves on the leather-hard surface of the



Figure 22. Vessel shapes depicted in the *Código de los Alfareros de Cuauhtitlan* with the names given in the document: (a) *molcaxete para cacaos* (b, c) *alcarrazas* (d) *jarro* (e, f) goblets without name in the document (g) plate with incisions on the bottom without name in the document (h) *tinaja* (i) pitcher without name in the document (j) *alcarraza* (k) bottle with lid without name in the document (l) *alcarraza* (m) *jarro pichel* (n) *alcarraza* (o, p, q) *jarros* (r) sugar bowl without name in the document (s) *jarro como caracol* (t) *jarro la hechura como negrito* (u) *jarro* (kidney-shape bowl with an appendage on the rim modelled as a Spanish man and two handles) (v) *jarro* (kidney-shape bowl with a plate -or a pedestal base- and two handles on the rim viewed from the top).

vessel), or a cover lid and a ring base are added. Other vessels illustrated had Spanish antecedents although they also had some Mesoamerican connections, even if they were not present in that form in late pre-Hispanic Red Ware collections. These vessels are named in the document as *tinajas* (amphorae with lids and small lateral handles), *jarros picheles* (pitchers with spout and handle, lid and ring base), *alcarrazas* (bottles with long neck, lid and small lateral handles decorated with an eagle), and other *jarros* (bowls with grooved walls, lateral handles and a small plate as if they were cups), and there are also other shapes not named (small pitchers with spout and handle, grooved body and ring base) that look like tee canes. There were also new shapes, such as *jarros de caracoles* (vessels modeled as snails), *jarros de negritos* (pitchers with long neck and ring base with body modeled like the face of a black man), and other unnamed bowls with composite kidney-like shape and an appendage on the rim modeled like the face of a Spanish bearded man with hut.

Some of the vessels in the codex were frequent in early colonial archeological contexts in the valley of Mexico, such as goblets, cups, pitchers and *molcajetes* (see Charlton *et al.* 2007; Fournier 1996:453). Others seem to be quite rare as is the case of the *jarros de negritos* and *caracoles* and those with the Spaniard face. The vessels with modeled faces were clearly a colonial innovation. Not only were the kind of personages represented new but the idea of modeling images on relatively common serving vessels was also new. Actually this form of embellishing vessels occurred in earlier times (some Teotihuacan style braziers had appendages with faces) but it was not common during the late pre-Hispanic period. This, however, corresponds well with the development of decoration on orange wares after the conquest. The painted decoration on these vessels became more iconic, that is, potters included more representations of animals and plants rather than linear and geometric patterns as in Late Aztec times.

All the vessels represented in the document as well as those found in archeological contexts were serving wares, some for individual consumption and some for the collective serving of beverages. In both cases the great morphological variety and creativity of early colonial Red Wares, which suggests that they became the favorite among indigenous-style ceramics is clearly evident. The illustrations of the codex suggest that already in the sixteenth century new shapes began to replace earlier red vessels of similar function; for example, it seems that cups replaced small drinking jars, or large jars with spout and

handle replaced *ollas* for serving liquids. Vessels from archeological contexts also evidence this trend. Simple bowls with flaring walls and goblets became more frequent after the conquest, replacing simple hemispherical bowls (see Charlton *et al.* 1995:148; Fournier 1996:453). Also among new Red Wares registered were large plates, cups, small pitchers and sugar bowls; all of them suggest in their shape, and even in their function, colonial influences. For example, plates and cups were the most frequent forms in Majolica wares (e.g., Goggin 1968: 152-153; Rodríguez Alegría 2002, II:442). On occasion red plates and cups had the same shape as Majolica vessels, although in other cases proportions and dimensions were rather different.

It seems that colonial Red Wares responded to the habits and stylistic preferences of the new colonial society while colonial Black-on-Orange wares remained more associated to the pre-Hispanic past. In both of them there were formal innovations but they were different. Black-on-Orange wares evidence a great creativity in supports while Red Wares seldom show these appendages. Tripod supports were clearly distinctive of the pre-Hispanic ceramic tradition while they were not used in Spanish ceramics (see Sánchez 1998). Thus their continuation in orange wares evidenced the connection with pre-Hispanic stylistic canons. In contrast, Red Wares included frequently ring bases. This ring for separating the base of the vessel from contact surfaces was common in Spanish-style ceramics (see Lister and Lister 1987; Sánchez 1998), although it was also known in pre-Hispanic Mesoamerica, in particular in Classic period Teotihuacan (see Rattray 2001). Red Wares also incorporated cover lids. In the same way as ring bases, vessel covers were common in Spanish-style ceramics although they were also known in Classic Teotihuacan (see Rattray 2001). In contrast, colonial Black-on-Orange wares as a rule did not have base rings or lids (see Charlton *et al.* 2007). Thus the incorporation of ring bases and lids in Red Wares evidenced the connection with Spanish stylistic canons. Many of the vessels illustrated in the codex of Cuauhtitlan also have ring bases and cover lids. In my opinion these attributes are represented as if they were distinctive elements at that time, as they appear, with clarity, in most of the vessels illustrated. In addition, Black-on-Orange and Red Wares had differences in morphological details but also in the assortment of vessels. Black-on-Orange vessels were often tripod bowls and dishes for individual and collective serving of food (see Charlton *et al.* 2007; Whalen and Parsons 1982:450). In contrast, Red Wares had more variety of forms;

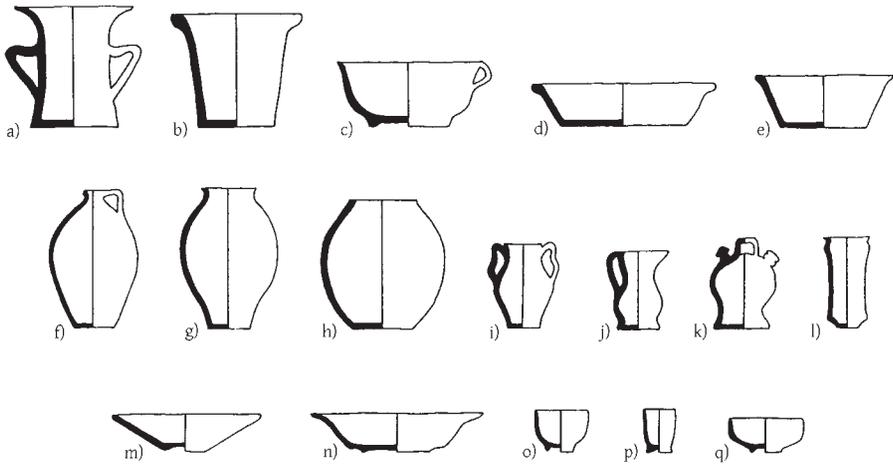


Figure 23. Vessel shapes made with the potter's wheel in the valley of Mexico: (a, b) *bacín* (c) *bacinilla* (d, e) *lebrillo* (f) *cántaro* (g) *tinaja* (h) *orza* (i) *jarra* (j) *pitchel* (k) *hidroceramo* (*botija*) (l) *albarello* (m, n) *plato* (o) *taza* (p) *pocillo* (q) *escudilla* (based on Deagan 1987: Fig. 4.1).

some were for individual serving of food but also for individual drinking and for collective serving of food and drink (see Charlton *et al.* 1995:148, 2007:446; Fournier 1996:453). This suggests that Red Wares were made for a variety of uses and contexts, while Black-on-Orange wares became more restricted to certain contexts. The differences between these two wares were, however, not directly associated to urban vs. rural separation. Black-on-Orange and Red Wares have been found in both urban and rural locations (see Charlton *et al.* 2005:59; 2007: 446; Rodríguez Alegría 2003:315).

Indigenous-style vessels continued to be made with mold after the conquest. Orange and Red Wares for cooking and serving were made using this forming method. Not considering Majolica wares, vessels made with potter's wheel were lead glazed and had specific shapes (Figure 23). These were mainly plates with ring base, cups, pitchers, *lebrillos* (basins), *bacines* (basins with high walls), *botijas* (amphorae for olive oil), *albarelos* (high drug vases) and candle holders. All of them had Spanish antecedent and names taken from the Spanish vessels' repertoire (Lister and Lister 1987; Sánchez 1998). A few of them were clearly related to Spanish uses, such as the olive jars, which were lead glazed in the interior to avoid filtration (Goggin 1960). The rest

could be associated to Spanish uses, such as the *albarellos*, which were medicine containers, or the *lebrillos*, which were chamber pots, but these uses were not exclusively Spanish customs. All these shapes were made with a Spanish-style forming method and did not incorporate Mesoamerican morphological details. This suggests that they were produced in Spanish-style workshops, and accordingly probably remained products for the Spanish colonial market.

A number of vessels for ritual uses continued to be made after the conquest. Charlton and colleagues (2007:455) report the presence of a few examples of long-handled censers in colonial urban contexts. They have also found a fragment of lead glazed censer in the rural area of Otumba. We do not know if these were used for indigenous rituals in domestic contexts or if they were incorporated into Christian ceremonies in churches. In any case, they were not frequent and they were not used in later times as they no longer appear in archeological contexts by the end of the early colonial period. Other objects with clear ritual use, such as large decorated braziers (e.g., Cervantes *et al.* 2007: Fig. 51), it seems that were not used in post-conquest contexts. Other pre-Hispanic ceramic ritual objects continued to be made after the conquest, nevertheless. They were not containers but figurines made of terracotta. These objects were typical of Mesoamerican life since at least the twelfth century BC, and were mainly associated to domestic contexts (e.g., Cyphers 1993; Groove and Gillespie 1998; Marcus 1996). Briefly summarizing the work of several specialists (Charlton *et al.* 2007:455-458; Müller 1973:98; von Winning 1988), early colonial figurines were made following the pre-Hispanic manufacturing method but they began to represent Spanish persons or new animals, like sheep, donkeys or dogs. Persons distinctively showed Spanish-style attire, such as dresses, huts and trousers. After the conquest the function of figurines changed, however. Later figurines were personages from *crèche* (Charlton *et al.* 2005:62), the representations of the nativity of Jesus popular in Spain and the colonies at that time.

In late pre-Hispanic times the fine polychrome vessels with pictographic decoration were for a variety of ceremonial purposes (see Hernández 2005). Based on their shape, high quality and pictography, these vessels were probably serving wares for feasting; namely, ritualized events in which food and drink functioned as the main means of expression (see Bray 2003; Dietler 1996; Dietler and Hayden 2001:3). Those events are well-documented in Mesoamerica. Sahagún and Durán, for example, describe festivities of the ritual calendar, the

government and other public celebrations in which big communal meals with special food, speeches, songs and other prescribed activities played a part e.g., Sahagún 1992, II: 121-122). It is also very possible that some vessels were containers for offerings of food, beverages or other substances, given the fact that in pre-Hispanic codices (e.g., Borgia 1993:8, 24, 45; Nuttall 1992:12) vessels with shapes similar to such polychrome ceramics appear as containers for food, burning resins, *pulque*, cacao or blood in diverse ceremonies. After the conquest, these vessels continued to be manufactured (Lind 1994:81). However, the pictography on these vessels became simpler and devoid of clear religious associations. The colonial eradication of public pre-Hispanic rituals and their associated visual symbols certainly modified the use and the context of these fine vessels. Probably they were still for special purposes, though of more mundane nature.

In brief, the early colonial vessel repertoire conserved many pre-Hispanic shapes, although they frequently incorporated new morphological details, such as ring bases or lids, which were characteristic of the Spanish ceramic tradition. These added extras modified the appearance of the vessels but not their function, however. Some of the morphological elements with Spanish antecedent were not present in Late Aztec ceramics but in earlier examples. It seems that the collapse of the Aztec empire promoted more variability in decorative techniques and morphology of ceramics. That is, archaeological ceramic remains suggest that potters experimented more with new and ancient forms and techniques and produced more variety of vessels. In addition, the uses and contexts of several vessels of the indigenous repertoire had some modifications after the conquest. For example, Red Wares became more preferred to Black-on-Orange wares. The first became the most popular indigenous-style wares for serving while the latter were less produced and finally disappeared by the end of the early colonial period. Also orange *molcajetes* as well as red pitchers, cups and goblets became more popular after the conquest. This was not the result of new functions for the vessels but of new form preferences for known functions. It seems however that a number of Red Wares were actually associated to new colonial uses, for example, *candeleros* (candle holders), *azucareras* (sugar bowls), *teteras* (cans for tee or milk), which were incorporated in the new colonial society and reflect new domestic and eating habits. After the conquest indigenous-style vessels were almost exclusively directed at domestic uses. Fine wares for special and ceremonial uses, such as polychrome vessels

Table 1. Indigenous vessels' nomenclature in Nahuatl, English and Spanish registered in the tenth book of the *Florentine Codex* (Sahagún 1961, X:83).

Nahuatl	English*	Spanish**	Nahuatl	English*	Spanish**
<i>comitl</i>	<i>ollas</i>	<i>ollas</i>	<i>tlamamanalcaxitl</i>	offering bowls	<i>vasos</i>
<i>paoazcomitl</i>	cooking <i>ollas</i>		<i>tlamamanalcaxitl</i>	offering bowls	<i>vasos</i>
<i>acomitl</i>	water jars	<i>tinajas</i>	<i>puchtecaiocaxitl</i>	merchants' bowls	<i>vasos</i>
<i>tzotzocolli</i>	large pitchers	<i>cántaros</i>	<i>ticeoac</i>	white bowls	<i>vasos</i>
<i>apilolli</i>	jars for water	<i>cantarillos</i>	<i>tlicaxitl</i>	black bowls	<i>vasos</i>
<i>apaztli</i>	glazed pottery basins	<i>bacines</i>	<i>xomatli</i>	ladles	<i>cucharas</i>
<i>tlalapaztli</i>	earthen basins		<i>motziquâtli</i>	combs	
<i>apantlecaxitl</i>	large braziers	<i>braseros</i>	<i>mulcaxitl</i>	sauce bowls	
<i>tlauiltetl</i>	candle holders	<i>candeleros</i>	<i>ixtecqui</i>	incised	
<i>caxitl</i>	bowls	<i>vasos</i>	<i>petzmucaxitl</i>	polished sauce bowls	
<i>quauhcaxitl</i>	wooden bowls	<i>vasos</i>	<i>mulcaxpetzli</i>	sauce bowls which have been polished	
<i>petzcaxitl</i>	polished bowls	<i>vasos</i>	<i>tlemolcaxitl</i>	frying sauce bowls	
<i>tlauhcaxitl</i>	reddish bowls	<i>vasos</i>	<i>tlatetzonilcaxitl</i>	frying bowls	

* = According to the English translation from the original Nahuatl text of the *Florentine Codex* by Anderson and Dibble (Sahagún 1961:83).

** = According to the corresponding text in Spanish in the *Historia General* of Sahagún (1992,X:571).

with pictographic decoration, were no longer made by the end of the early colonial period. Red vessels, or even Majolica, became the fine serving ware of that time and possibly replaced the vessels with pictography in some contexts; however they were not *per se* vessels for ceremony.

The tenth book of the *Florentine Codex* offers good insights into indigenous vessel nomenclature in Nahuatl (Sahagún 1961, X:83). Sahagún presents a list of the different clay objects made by potters and sold by dealers according to his indigenous collaborators. Thus, this list reflects the repertoire of vessels that were considered as indigenous in the second part of the sixteenth century; some of them were probably old objects no longer made but still present in the collective memory, while others were at that time in use. The names and categories of vessels are still pre-Hispanic (Table 1). Objects were named following different criteria, like use, material, method of decoration and visual aspect. Vessels for cooking and vessels for water were

clearly separated. Also serving vessels had different names according to their use and appearance. Some of the names can now be associated with particular wares, for example, *tlauhcaxítl*, reddish bowls, were surely the vessels with red slip. However others were difficult to identify, for example, *ticeoac*, white bowls, or *tlilcaxítl*, black bowls, as the vessels' inventory did not include objects covered with white or black painting. In my opinion, offering bowls, white bowls and black bowls corresponded to different names given to the fine polychrome wares with pictographic decoration. In pre-Hispanic times these vessels were often painted with thematic complexes of motifs referring to sacrifice, to darkness or to white papers (see Hernández 2005). The list further indicates that *molcajetes* had several categories, probably because these vessels had different purposes and styles. In addition, included in the list are two Spanish-style objects: the *apaztli*, translated in the *Historia General* as *bacines* (Sahagún 1992,X:571), that is glazed pottery basins, as well as the *tlauiltetl*, candle holders or *candeleros* (Sahagún 1992,X:571). This shows that these two kinds of vessels were at that time already incorporated into the indigenous repertoire, and therefore they were made in indigenous-style workshops and received Nahuatl names.

The *Códice de los Alfareros de Cuauhtitlan* indicates, however, that vessels with a mixture of Spanish and indigenous antecedents and colonial innovations, received Spanish names, at least in contexts of contact with colonial authorities. For example, the codex refers to *alcarrazas* (bottle-like jars with globular body and tall neck), *tinajas* (amphorae with small lateral handles), and *jarros pichelos* (pitchers with handle and stout and ring base). Also in that document is used the Spanish word *jarros* as a generic name for vessels, while grinding bowls, exclusive of the Mesoamerican tradition, are still called in Nahuatl *molcaxetes*. Some of the new early colonial names were connected to specific vessel shapes, thus when the objects disappeared the name was also lost. For example, neither the shape nor the name *alcarraza* or *jarro pichel* continue to be used at present. At the same time, a number of typical Mesoamerican vessels have conserved their Nahuatl name until today, though incorporated into Mexican Spanish language. This is the case of *caxítl* (bowl, today *cajete*), *molcaxítl* (grinding bowl, today *molcajete*), *comalli* (griddle, today *comal*), and *tecomatl* (today for spherical bowls, *tecomate*). On the other side, vessel shapes with Spanish origin and made with the potter's wheel

received Spanish names, such as *lebrillos* (basins), *bacines* (basins with high walls), *botijas* (amphorae for olive oil), *albarelos* (high vases), *tazas* (cups) and *candeleros* (candle holders).

The list of clay objects made by potters and sold by dealers in the *Florentine Codex* shows that vessels were also categorized according to their manufacturing quality (see Table 1). In particular the list indicates that there were different kinds of low-quality vessels, for example, *nanalca*, [those which] sound cracked, *tlemotzinquí*, fired-cracked, *aicucic*, poorly fired, or *tlaçacatlaxcaluilli*, treated with yellow coloring, which Sahagún in the *Historia General* (1992,X:571) explains in this way: “porque no estaban bien cocidas échales algún color encima o tiñelas con amarillo.”¹⁰ This suggests that potters were extremely careful in the use of clay and fuel, and that imperfect vessels were also offered to the market. The same occurs at present, as clay and fuel are expensive and therefore potters have to economize as much as possible. It might be that this was also the case in early colonial times.

In addition, the introduction of the various Spanish systems of measures and weights and the colonial monetary system altered the nomenclature for vessels' sizes. Units for naming the sizes of the vessels and for selling were taken from the Spanish system. According to Hernán Cortés (1942, I:100), in the city markets of the conquest period, indigenous measures were used based on volume but not on weight. Although we do not know how the various dimensions of vessels were named in pre-conquest times, it seems that during colonial times names were incorporated that corresponded to the economic context at that time. This is evidenced by the fact that until the present time in regions of central Mexico some pots are called according to their price in the colonial monetary system. For example, today in Amozoc, Puebla the different sizes of *ollas* are called (from the biggest to the smallest): *dos reales*, *de a real*, *de a medio* (real), *de a tres* (*cuartas*, span of a hand), *de a dos* (*cuartas*, span of a hand), *de a tlaco* (in Nahuatl in the middle). In contrast, in San Miguel Tenextatiloyan, Puebla several sizes of *cazuela* are named according to the quantity of vessels *por carga*, per load: (from the biggest to the smallest) *de a cuarenta* (items *por carga*), *de a cuatro* (dozens *por carga*), *de a seis* (dozens *por carga*). The shifting to the *carga* (equal to two *fanegas*) occurred in the middle or late eighteenth century (Gibson 1964:357).

¹⁰ “Because they were not well fired they covered them with some color or painted them in yellow” (Sahagún 1992;X:571, my translation).

In this case, naming also has reminiscences of the indigenous nomenclature, as the ancient vigesimal numeration is still involved. The use of the vigesimal system can also be seen in the *Código de los Alfareros de Cuauhtitlan*, as it is written that the judge "... pagó un peso dos tomines (y medio) por veinte jarros que le dí (de) más ..." ¹¹ (Barlow 1951:7). Thus, present-day vessel size naming is a mixture of different systems and reflects the colonial intertwinement of various taxonomies, nomenclatures and methods of measuring.

In brief, during the early colonial period every stage of the production sequence of indigenous-style ceramics had different developments. Potters had diverse and complex reactions to the new situation. In some parts of the process of manufacturing they were highly creative and innovative, for example in decoration and morphological details. In other parts of the process they remained attached to their own techniques, as in the case of the forming method, even after a new forming method with new possibilities was introduced to Mesoamerica. Potters were well aware of the Spanish ceramic tradition. The Spaniards introduced new methods for making pottery and new decorative styles, but Mesoamerican potters incorporated them in variable degrees, as we will see below. Furthermore, the Spanish pottery technology not only inspired native potters, but also it became a source of social differentiation. It seems that indigenous-style workshops and Spanish-style workshops were maintained separately, as the dissimilar manufacturing techniques of indigenous-style and Spanish-style artifacts suggest. However, the context of use of the vessels of these two traditions, and their users, were not well differentiated, as we will see in the last part of this chapter.

The impact of the Spanish ceramic technology

In 1960 George Foster published *Culture and Conquest: America's Spanish Heritage*, one of the first studies on the effects of the Spanish conquest on indigenous material culture. For him, European techniques were obviously more advanced; therefore it was to be expected that native craftspeople adopted them, and that this promoted technological progress. However often in Mesoamerica, but also in other regions of the world, this was not the case. Thus, Foster devoted that

¹¹ "He paid one peso and two *tomines* (and a half) for twenty pitchers I gave him extra" (Barlow 1951:7, my translation).

work and further publications to explore why indigenous people did not accept European introductions (Foster 1959, 1962, 1967). This question reflected the evolutionistic thinking at that time. The ideas of Foster are now outdated; in more recent studies indigenous ceramic technologies are no longer seen as underdeveloped, rather than as other traditions with different trajectories as the European (e.g., Gasco 2005a; Lackey 1981; Papousek 1981). Still, the question of what aspects of the Spanish ceramic technology were incorporated by native potters is basic to obtain a deeper understanding of the interaction between indigenous and Spanish culture. After several decades of study of colonial artifacts (e.g., Charlton 1972, 1977; Charlton and Fournier 1993; Charlton *et al.* 1995, 2005, 2007; Fournier 1997; González Rul 1988; Gasco 1992; Rodríguez Alegría 2003, 2005) we now have more elements to offer an answer.

As in the case of Mesoamerica, ceramic-making had a large tradition in the Iberian Peninsula with several episodes of major transformations, such as the Roman period or the later Arabic period that extended from the eighth to the fifteenth centuries (see McEwan 1992; Sánchez 1994, 1996, 1998). Only a small part of that technology arrived in Mesoamerica. Shortly after Columbus founded a settlement in the Dominican Republic, ceramics from Seville arrived on the island (Deagan and Cruxent 2002:139-141). Later ceramics from that city were also shipped to Mexico (Sánchez 1996:132). However, the high costs of transportation, the growing number of Spanish settlers in the colonies, and especially the interest in maintaining the Spanish material culture, resulted in several Spanish potters being brought to Mexico City. At that time Seville was the port of embarkation for the transatlantic fleet and the place where the trade with the Americas was controlled, therefore it was a flourishing and wealthy metropolis. The neighboring town of Triana, specialized in ceramic manufacturing, was the place where the majority of the exported ceramics were made (Myers *et al.* 1992:131), and probably the origin of the potters who arrived in Mexico. This town underwent significant growth as the intercontinental trade expanded and the prosperous Seville society required more luxurious objects (Lister and Lister 1987:122). Due to limitations on transport, the majority of the ceramics that arrived in Mexico were containers (in particular olive oil jars) and serving wares (Sánchez 1998:122-123), in particular Majolica, at that time the favorite vessels for such a function. In Mexico, Spanish potters concentrated on the production of these wares as well, but they also made a

few shapes necessary for maintaining the Spanish domestic culture, such as as *candeleros* or *bacines*. Thus, the ceramic technology that arrived in Mesoamerica from Seville, was associated to the manufacture of serving wares, and stylistically corresponded to the end of the Arabic decorative tradition and the beginnings of the renaissance in that region of Spain (Lister and Lister 1978; Sánchez 1998:127). This transition coincided with the political events of the sixteenth century in the Iberian Peninsula, such as the re-conquest of the last Muslim territories, the unification of kingdoms, and in general terms, the end of the Middle Ages (see Bartlett 1993:241-242).

It seems that Spanish-style workshops in Mexico City were maintained separately from indigenous-style workshops. This is recognized in the use of different methods of manufacture, different shapes and different decorations in vessels from both traditions. Despite that separation, native potters were well aware of the newcomer ceramic technology, and selectively incorporated and readapted various elements. Foster (1960:101-102) and other specialists (Gámez 2003:231; Martínez Peñaloza 1981:26; Müller 1973:98) emphasize that the Spaniards made three major introductions in Mesoamerica in relation to ceramic-making: the potter's wheel, the two-chamber kiln and the glaze. However, the wheel was not really implemented by native potters. As commented above, it seems that this method did not represent an improvement to the known technology, and therefore there was no reason to modify the most stable part of the production sequence, which was deeply rooted in potter families for generations and intimately associated to their own conceptualizations about pottery (Hernández 2008). The kiln was not a Spanish introduction. At least since the tenth century two-chamber updraft kilns were used in Tula, and, although other examples have not been found in central Mexico, there is no reason to believe that this was an exception. The lead glaze was indeed a novelty that attracted the attention of indigenous potters and was widely implemented early in the colonial period. This new decoration was showy and relatively easy to create. The mixture of lead oxide, silicate and clay in three equal parts was not difficult to produce once the potter knew the recipe. The problematic part was that vessels should be fired twice, and the second fire required enough temperature to reach the melting point of the glaze. However, it seems this was not a limitation as lead glazed indigenous-style vessels were broadly distributed in early colonial times, both in urban and rural contexts. This new form of decoration simplified the process

of surface finishing as it was not necessary to burnish the vessel in detail; it also made the surface more impermeable. However, the glossy finishing was probably the most attractive quality for potters. Some early vessels were glazed in parts where economy of burnishing and water-resistance were not important criteria, for example, tripod *molcajetes* had glazed supports.

Decoration with lead glaze was without a doubt the aspect of the Spanish ceramic technology most implemented by native potters. Nevertheless, early colonial indigenous-style vessels also show other decorative elements taken from the Spanish tradition. The majority, however, were not copies of decorations on Spanish-style ceramics but reinterpretations of motifs depicted in other media or original creations derived from the New World brought by the Spaniards. A few colonial Red Wares were painted with a band of black curvilinear motifs which were alike, but not identical, to decorations on the Indígena wares, those early colonial vessels with white slip and lead glaze, considered by some specialists as native imitations of Majolica ceramics (Charlton *et al.* 2007:470-71; Lister and Lister 1978:21). Also that curvilinear decoration had some resemblance to motifs painted on the earliest Majolica wares in Mexico City (see Charlton *et al.* 2007:449,472-477). However this kind of adornment was rather exceptional; most of the new decorations with Spanish influence did not occur in Spanish-style vessels. For example, early colonial Black-on-Orange wares were painted with iconic images of flowers, fishes, birds, leaves and ears of wheat. Most of these images were not new in Mesoamerican ceramics but they were not painted before on these wares. Their style of representation was also a bit different to earlier figural depictions, and showed a little Spanish influence. In addition, the supports of these vessels were modeled in new shapes, some clearly inspired by colonial animals, like pig hoofs and lion claws.

In addition to decorative elements, indigenous potters also incorporated a few vessel shapes of the Spanish tradition. For example, extended plates or small cups with flat handles were the most common forms of Majolica wares (Charlton *et al.* 2007:463) while they, in that particular shape, were not made before in Mesoamerica. These vessels were incorporated into the wide early colonial repertoire of Red Wares. From their shape, they were for uses associated with Spanish domestic culture, but it seems that they also replaced Mesoamerican vessel forms with similar functions that became less popular after the conquest. The rest of the morphological novelties were details

for embellishing the vessels rather than for modifying their function; for example, colonial Red Wares incorporated ring bases and cover lids that were characteristic of Spanish vessels at that time. In addition, as in the case of decoration, some morphological innovations were not imitations of European ceramics but were inspired by the new culture that arrived in Mesoamerica. This was clearly the case of the scarce *jarros de negritos* and the bowls with rim appendages modeled as faces of Spanish men represented in the *Códice de los Alfareros de Cuauhtitlan*.

However, a number of colonial innovations in decoration and morphology of indigenous-style ceramics were not associated with the European world. For example, early colonial potters incorporated in the inventory of Red Wares vessels decorated with grooving, differential polishing, incrustations and stamping, but these techniques were not used in Spanish ceramics. In addition, several decorative elements and morphological details that in pre-Hispanic times were exclusively associated to particular wares, appeared after the conquest in other kinds of vessels. For example, colonial Black-on-Orange wares incorporated decorative patterns that in the Late Aztec period were exclusive of Red Wares. Black-on-Orange vessels also presented supports that in pre-Hispanic times were exclusive of polychrome vessels with pictographic decoration. These novelties and the flexibility of decorative canons were possibly related to the collapse of the Aztec empire which it seems promoted more creativity among potters. That is, not all changes manifested in colonial vessels were a consequence of the encounter with the Spanish material culture. In my opinion, the conquest did not interrupt, but rather altered, the trajectories of indigenous ceramic technology.

Thus, Mesoamerican potters openly and selectively incorporated or reinterpreted a number of elements of Spanish ceramic technology, in particular in vessel decoration and morphology. They were also inspired by the new colonial world and created new decorative compositions, which were more figural and iconic than in pre-Hispanic times. In contrast, Spanish ceramic technology adopted practically nothing from the indigenous tradition, neither in Seville nor in Mexico City. People associated with the colonial rule in the valley of Mexico used indigenous-style pottery. For example, many Red Wares have been found in *La Traza* (Rodríguez Alegría 2003), the most prominent area of the city, and also in churches and convents in the valley of Mexico and elsewhere. However, Spanish-style workshops

apparently did not produce vessels of the indigenous tradition. This is suggested by the lack of indigenous-style vessels made with the wheel. The reasons for this rejection might be in part related to the colonial situation; namely, the unequal power relations between colonizers and colonized, the conviction of European technological superiority, and the need of the colonizers to maintain the cultural association with their fatherland. However, part of the reason was probably of a technical nature. As was the case for Mesoamerican-style workshops, Spanish-style workshops were attached to their own methods of manufacture.

In brief, early colonial Mesoamerican potters had various reactions to Spanish technology. On the one hand, they selectively incorporated and reinterpreted elements of decoration and morphology, and were inspired by the world brought by the Spaniards in the creation of new decorative motifs. On the other, they did not implement technical devices that did not accord to their necessities, such as the potter's wheel. In my opinion, the inclusion of Spanish decorative elements in the vessels was not related to attitudes of submission, just as the rejection of Spanish devices was not related to attitudes of subversion. Potters worked following the same dynamics as in ancient times, that is, they conserved their familiar methods of forming while they adapted the visible aspects of the vessels to the situation of the present time. These two basic characteristics, existing at the same time, are evident in the entire ceramic production of the pre-Hispanic history. Thus, in the early colonial period the incorporation, adaptation or rejection of Spanish elements was not politicized by potters. They just wanted to maintain their way of living and adapt to the new post-conquest society.

*Ceramics as indices of cultural affiliation
in early colonial central Mexico*

The equation of a ceramic complex with a social group is a problematic task in archaeology. Objects may be associated with cultural affiliation (Aztec-style ceramics *are* Aztec ceramics), and with uses distinctive of that culture (Aztec-style ceramics are for Aztec uses), but in practice we recognize that the relationship between objects, users and uses is more complex. In the reconstruction of colonial encounters the correlation of some objects with colonizers and others

with the colonized can be particularly misleading. On the one hand, colonial societies were heterogeneous and included a variety of social groups beyond the categories of native and foreign peoples. On the other, material culture in those situations also had a variety of associations, meanings and contexts, so that it could not simply be pigeon-holed in the dichotomy native *vs.* foreign (for a recent discussion see Voss 2008). For example, in central Mexico early colonial ceramics cannot just be divided into two groups, indigenous *vs.* Spanish. The repertoire was composed of several kinds of vessels which according to their provenance, manufacturing method, shape and decoration had different ties to the various components of the colonial society. According to these aspects, ceramic vessels can be better arranged in a continuum in which the two extremes are clearly differentiated. On the one side, we can group the ceramics made in Mesoamerica with native technology and no Spanish or colonial influence. On the other, we can group the Majolica wares made in Spain and exported to the Americas, but in between there were several wares with variable associations to the native and foreign cultures. Even in the case of these two extremes we cannot make an unambiguous correlation between indigenous ceramics and indigenous users and Spanish ceramics and Spanish users, as we know there were exceptions. For example, indigenous nobility used Spanish-style ceramics (e.g., Lind 1987:111) while in the houses of prominent colonial authorities indigenous-style wares were used (e.g., Rodríguez Alegría 2005).

The regulations of the potters' guild from 1653 indicate that colonial authorities made a distinction between fine grade Majolica ware, common grade Majolica ware and *loza amarilla* (lead glazed ware), while the rest of the ceramics produced in Mexico were just considered apart and ignored in the regulations. At that time guilds were created to protect industries and craftspeople closely associated to the colonizers' culture (Carrera Estampa 1954). Thus, these three kinds of ceramics were seen as components of that culture. Although we do not have documentary references on how the remaining ceramics were categorized, we can recognize several well-differentiated wares according to the method of manufacture, shape and decoration. Every one of these wares had particular connections with the colonial culture. At one extreme of the list we place the simple vessels for domestic purposes made in Mesoamerica with pre-Hispanic forming methods and style, which incorporated minor morphological alterations after the conquest but were not the result of Spanish influence or

of notable modifications in function. This was the case of *jars*, *bowls* and *comales*. The second group is composed of the Black-on-Orange vessels which were clearly a continuation of the popular Late Aztec serving wares but incorporated new decorations inspired by the colonial culture. In a third group we include domestic wares made by mold with indigenous shapes but decorated with lead glazing, a clear Spanish introduction. This was the case of *molcajetes*, pitchers and small jars. In a fourth group we have the Red Wares which were made by mold and were a continuation of the pre-Hispanic red vessels but show notable colonial creativity. New shapes and decorations were introduced; a few of them were taken from the Spanish ceramic tradition but others were colonial innovations. Then we have those ceramics which the guild regulations associated with the colonizers' culture. Thus, a fifth group includes domestic lead glazed vessels made by wheel with Spanish-style shapes. The sixth group consists of the Majolica wares produced in Mexico City, made by wheel and with Spanish-style shapes and decoration. And finally, at the other extreme of the list, we have Majolica and porcelain wares imported from Europe and Asia.

At the beginning of the colonial domination, Spanish-style objects, such as Majolica wares and lead glazed vessels, were for Spanish use as their purpose was to preserve domestic habits of the fatherland. However, by the early seventeenth century society became more heterogeneous and social position was not only determined by cultural affiliation but also by social and economic position (Lockhart 1992:433). In this context many Spanish-style objects became elements for indicating the own social place (Gibson 1964:153-156). It seems this was the case of Majolica wares. They continued being associated with the colonizers' culture but they were not exclusively used by those representing that culture. They were often used by colonial authorities or persons with Spanish antecedent. The archeological distribution of these objects shows that they were common in locations related to the colonizers' culture, such as churches, convents and houses of authorities (e.g., Fournier 1990; Lister and Lister 1978; López Cervantes 1982), but they were also present in, for example, Tlatelolco, an indigenous sector of the city (see Charlton *et al.* 2005:463-469). In addition, the use of Majolica wares was an urban phenomenon in the valley of Mexico, as the city was the place of direct interaction between the indigenous and the Spanish cultures.

However, a few fragments of these wares have been also found in rural locations in the Otumba region (Charlton *et al.* 2005:58).

Red Wares had a different status. They were visibly a continuation of pre-Hispanic ceramics, and their method of manufacture, shape and decoration was distinctive of the pre-Hispanic tradition. However, after the conquest they evidence a creative impulse, as they incorporated many new shapes and decorations; some of them associated with colonial culture. The the *Códice de los Alfareros de Cuauhtitlan* shows that four decades after 1521 Red Wares continued to be made in indigenous settlements, and they were also requested by colonial authorities, like the *alcalde mayor* of that town. The archeological distribution of Red Wares also evidence that they were used in various sectors of colonial society. For example, they were frequent in Tlatelolco (Charlton *et al.* 1995), but as Rodríguez Alegría investigated (2005:560-563), they were also present in houses of *La Traza* associated with prominent families of the colonial administration. A review of ceramic collections from several places in the valley of Mexico shows that they occurred as well in churches and convents, such as the Metropolitan cathedral and the convents of Bethlemitas and San Jerónimo. Their popularity extended even beyond the valley of Mexico, as they were frequent in, for example, convents of Cholula (Müller 1973; Plunket *et al.* 1994; Sáenz 2004) and the palace of Cortés in Cuernavaca (Charlton *et al.* 1995:150). They were frequent in urban contexts although they have also been found in the rural area of Otumba (Charlton *et al.* 2005:59). In comparison to Black-on-Orange ceramics, Red Wares became the favorite indigenous-style serving wares in early colonial times. The colonial shapes and decoration show that they were adapted to the new colonial necessities (e.g., candle holders, Spanish-style plates, cups) but could also be used for pre-Hispanic functions (e.g., *molcajetes*). In that way they could satisfy the necessities of a variety of people.

The situation of Black-on-Orange wares was different. They were a direct continuation of the typical Late Aztec wares. Although they incorporated a few new decorations and morphological details inspired by the new colonial world, they were less produced after the conquest and disappeared by the end of the early colonial period. These ceramics were not adapted to the new colonial preferences. That is, after the conquest there were no innovations in vessel shapes. The archeological distribution of Black-on-Orange wares suggests that

they were more common in contexts related to indigenous culture, such as Tlatelolco and Otumba (Charlton *et al.* 2007:439-440).

Thus, in the early colonial valley of Mexico, ceramics were not clear indices of cultural affiliation. Likely wares associated by style and function to the Spanish world were characteristic of contexts related to that culture. In the same way, vessels associated by style and function to the indigenous world were more frequent in contexts related to that culture. Nevertheless, some ceramics, such as Red Wares and lead glazed vessels made with indigenous techniques, were in-between. They were adapted to colonial society, and for this reason, they had a variety of users and contexts of use.

Early colonial ceramics in central Mexico

After the conquest the pre-Hispanic ceramic tradition from central Mexico persisted. The collapse of the Aztec empire, the new colonial society, and the introduction of the Spanish ceramic tradition did impact native technology, but it was different for every stage of the production sequence of ceramic vessels. The part of the sequence more deeply rooted in potters and more directly tied to their own conceptions on pottery—the method of manufacture—was maintained without change. In contrast, other parts of the production sequence, more visible and flexible, like surface finishing, decoration and assembling the vessel repertoire, had modifications and evidenced great colonial creativity. A few innovations were the direct result of the influence of the Spanish ceramic tradition. For example, the most important novelty in decoration was the lead glaze, a Spanish introduction. It attracted the attention of indigenous potters and users, so that early in the colonial period it was widely implemented in central Mexico. However, the majority of the decorative innovations were a consequence of new ideas inspired by the colonial world. This was the case of motifs painted on Black-on-Orange wares representing animals and plants brought by the Spaniards. Also the indigenous vessel inventory incorporated a few new shapes taken from the Spanish inventory; however many morphological innovations were minor details for embellishing the vessels not present either in Spanish or in Late Aztec ceramics.

The basic pre-Hispanic vessel repertoire for domestic activities was maintained without important changes. These artifacts were not mod-

ified to satisfy the necessities of the new Spanish settlers. For that purpose the colonizers first brought ceramics from Seville, and then Spanish potters who established workshops in Mexico City. They manufactured Spanish-style vessels using the Spanish forming method (the potter's wheel), and shaped and decorated them in the same way as in Spain. Thus, indigenous and Spanish ceramic traditions existed at the same time but were maintained separately, and for this reason, their products maintained their own dynamics of development. It has been suggested that indigenous domestic ceramics deteriorated after the conquest, as the surface finishing of orange jars and bowls was less carefully done (e.g., Charlton *et al.* 2005:58), but in my opinion this was not the case. Early colonial potters preferred to finish the surface of common jars and bowls with lead glaze rather than with burnishing. Thus, as glazed vessels became more popular, burnished vessels were less produced, but this process of replacement has not been recognized.

In contrast to cooking vessels, the early colonial repertoire of serving wares manifested great formal creativity. Many new vessel shapes were introduced, although the majority was not for new functions, but rather to replace earlier vessels of similar functions. Many of the new shapes incorporated morphological details from the Spanish tradition, such as lids or ring bases, while typical pre-Hispanic elements, such as tripod supports, were suppressed. In that way serving wares developed a distinctive colonial style. Red Wares became the favorite vessels for eating and drinking while Black-on-Orange wares became much less frequent and finally disappeared. Colonial serving vessels were often decorated, although not in the same way as in pre-Hispanic times. The most popular decoration became the red slip with a variety of surface treatments. In contrast, the typical Late Aztec decoration, black painting on an orange surface, became less frequent. Also vessels with pictographic decoration became very scarce after the conquest. Their motifs became simpler, less varied and less associated to ritual/religious meanings, thus it seems that the function of decoration on ceramics changed. Fine polychrome vessels were no longer media of literacy. In pre-Hispanic times these fine vessels were serving wares for special occasions, like feasting, but they were also used as containers in other ritual activities such as offering ceremonies or funerary rituals (see Hernández 2005). The changes in their decoration after the conquest suggest that these vessels were no longer openly created for ritual purposes. In addition, vessels for exclusive ritual

purposes, like censers, disappeared after the conquest, although there is rare evidence of their manufacture and use in the first colonial years.

The system of interregional trade of ceramics collapsed after the conquest. This was a consequence of the end of the Aztec empire and the disintegration of trade routes. In prominent contexts the new Spanish-style ceramics took the place of the earlier luxury objects from other parts of Mesoamerica. Thus, the early colonial ceramic repertoire in the valley of Mexico was formed by several kinds of vessels produced for the most part in that region. On the one side, there were Spanish-style vessels. On the other, there was a variety of indigenous-style ceramics, which incorporated new shapes of decorations after the conquest. They maintained, however, many pre-Hispanic elements. Some of them were clearly visible, such as the red slip of Red Wares, or the shape of cooking objects but others were not visible, such as the use molds for forming vessels. Nevertheless, all these traits show that the conquest did not interrupt the transmission of knowledge in potter families.

CHAPTER FIVE

CERAMIC-MAKING AT PRESENT

The Mesoamerican ceramic tradition continued to live on after the early colonial period. It also persisted in the late part of the colonial period and in the subsequent independent era, even after indigenous society experienced deeper changes; and it is still present in central Mexico. Although vessels made today, at the end of the first decade of the twenty-first century, do not usually look as in late pre-Hispanic or early colonial times, potters have conserved many ancient traits in the methods of manufacture. This ceramic tradition is now heterogenous; it has a variety of expressions which are connected in different ways to the pre-Hispanic past. For example, in a number of places potters continue making ceramics very similar in technology, shape, decoration and function to those of pre-Hispanic times. In many other places potters produce lead glazed vessels for domestic purposes, which do not have the same appearance as in earlier times but are still made according to ancient methods of manufacture. Moreover, in other places potters have specialized in the manufacture of ceramics for the tourist market, that is, in the so-called *artesanías*, those ceramics made in the style that tourists or urban consumers consider 'typical Mexican'. These objects have also conserved ancient manufacturing methods.

In these three situations the prospects for the ceramic industry tend to be different. In the first case ceramic-making is endangered, potters are as a rule older people and knowledge is practically no longer transmitted to younger generations. This is the case, for example, of Santo Domingo Tonaltepec in the Mixtec highlands or Tepexoyuca in the state of Mexico. In the second and third cases ceramic-making is now rapidly changing and adapting to exigencies of the market, and younger people continue to be involved. This is the case of pottery towns such as San Miguel Tenextatiloyan and Amozoc in the state of Puebla or Metepec and the towns close to Temascalcingo in the state of Mexico. In this chapter we will mainly focus on the second case because it coincides better with the situation of this industry on the eve of the conquest and the early colonial period, that is, in these three

epochs ceramics are made for domestic purposes and the craft is flourishing and incorporating many innovations. In central Mexico there are a number of towns specialized in ceramic-making with these conditions.

The present-day ceramic technology is a continuation of the late pre-Hispanic and colonial expertises in this industry, although there have been modifications. As we have seen in the last chapter, during the early colonial period many elements of the pre-conquest ceramic tradition were conserved, however in late colonial times it seems that this situation changed. The late part of the colonial era was shaped by the Bourbon reforms. They involved a series of administrative and commercial changes that encouraged trade, augmented bureaucracy and limited faculties of the church (Knight 2002:202-208). In addition, there was a notable population growth, and due to the expansion of mining and other export industries and the concentration of land in the hands of a few landholders (*haciendas*), social and economic differentiation notably increased. All this had deeper consequences in the indigenous communities, so that Mesoamerican forms of organization that were maintained throughout the first colonial century began to change (Lockhart 1992:429). In my opinion, these historical processes also had effects on the indigenous ceramic tradition of central Mexico. That is, indigenous-style ceramics began to change, and became less similar to the pre-Hispanic wares. Although archaeological research in late colonial contexts is to date scarce, we know that typical late pre-Hispanic vessels, such as the Black-on-Orange wares or the polychromes wares, were no longer present (Charlton *et al.* 2007). New serving wares with diverse qualities were introduced to supply the increasingly hierarchical late colonial society. Red Wares continued but they became more differentiated from their pre-Hispanic antecedents (e.g., Fairbanks 1966). Tonalá wares became favorite indigenous-style ceramics at that time (Charlton and Katz 1979). Majolica wares, lead glazed wares and Chinese and European porcelains were frequent and varied (see Fournier 1990; 1997; Gámez 2003; Lister and Lister 1987).

The period between the Mexican independence and the revolution of 1910 is poorly documented in the archeological record from central Mexico. The scarce studies of ceramics from that time are brief and concentrated in a small region of the valley of Mexico (Charlton 1970, 1972), so that a detailed view of the vessel inventory is still lacking. Thus, we do not know how this technology reacted to the first inde-

pendent decades, the enlightenment reforms of the nineteenth century, and the regime of Porfirio Díaz in which technological progress was accompanied by increasing marginalization of the countryside and exploitation of urban workers. We also do not know how the ceramic technology was during the first decades after the revolution of 1910. The information gap ended in the 1950s when the first anthropological studies of contemporary ceramics in central Mexico appeared (Díaz 1966; Foster 1959, 1967; Rendón 1950). These publications documented the situation of pottery towns at that time, considering aspects such as the process and organization of production. Those early scholars gave special attention to the methods of manufacture, vessel forms and decorations with pre-Hispanic antecedents. Thus, they presented ceramic-making as a static and conservative occupation, closely attached to ancient forms of social organization. After these initial studies, in the 1970s and 1980s more scholars investigated contemporary ceramics (e.g., Engelbrecht 1987; Katz 1977; Lackey 1981; Papousek 1981). They recognized that ceramic-making was changing and that some aspects registered in earlier studies were at that time not present. These researchers also observed that potters were not as conservative as their predecessors believed. Today this craft continues to change, and many aspects documented by Foster, and even by scholars of the 1980s, have also been modified. This is evidently related to the important changes that Mexican society experienced in the last fifty years.

Mexico has been transformed since the 1960s. There has been an extraordinary population growth, and the migration from rural areas to urban centers and the United States has notably increased, so that social organization and culture of towns is now being completely reshaped. There has also been a general modernization trend in society and government. For example, the school education has been generalized, the health system has been improved and made accessible to more people, road and communication infrastructure has been notably extended, and access to international information and markets is now possible for more people. All this has had effects on the ancient community and its material culture. In some places the community, as a form of organization, is practically disappearing as towns are being incorporated into the cities, and the urban culture has been extended. In other places, the community has been preserved but mainly because it has not been integrated into the new social welfare. Still, in other towns parts of the ancient organization and habits have

been maintained while at the same time a number of aspects of modern Mexico are present. These dynamics also apply to towns specialized in ceramic-making.

In central Mexico cities are important magnets for the surrounding rural population. Despite this, rural and semi-rural towns in which agriculture and traditional crafts are the main source of income still exist. They have, however, incorporated many elements of the urban life due to their proximity to urban centers. In some of these towns several aspects of indigenous culture have been preserved. For example, some elders still speak Nahuatl, Mazahua or Otomi; the system of cargos for the organization of festivities is present, and religious ceremonies maintain ancient elements intertwined with the Catholic ritual. Some of these towns are still recognized as indigenous towns, for example, the pottery towns of San Miguel Tenextatiloyan in Puebla and Santa María Chancesdá in the state of Mexico. However, many others are no longer seen as indigenous towns, as a large part of their inhabitants do not feel attached to the indigenous culture and the expansion of the urban customs has homogenized the various ways of life. Still, in these towns have been maintained parts of the ancient domestic culture, such as the form of subsistence and the food habits.

As seen in the previous chapter, during the colonial period common industries, like ceramic-making, did not attract the attention of the authorities. It seems that this situation continued after the independence. However, in 1921 the artist Gerardo Murillo (Doctor Atl) (1980) proposed an exhibition of Mexican popular art as part of the events to commemorate the first centenary of independence. This was the first time that common crafts, such as domestic ceramics, were presented in a museum. This was also the first time that quotidian objects associated with contemporary indigenous culture were considered art, although they received the label 'popular' art to distinguish them from what was seen as 'higher' forms of art. This exhibition was a success as it not only attracted the attention of intellectuals and artists but also of the wider public. It also initiated an academic discussion on the definition and purposes of the so-called *popular* art. Moreover, it attracted attention to the objects themselves; for example, they began to decorate the living rooms of prominent personalities (Murillo 1980). The exhibition had as well several effects on the pottery towns: the artistic skills of craftspeople and the value of their works were recognized in urban contexts, thus, the conservation of ancient manufacturing methods was promoted, and a new consumer

market was opened. However, it seems that this event also modified the trajectories of these industries, as new canons in shape and decoration were dictated to satisfy the new market. In my opinion, all these effects have shaped the trajectory of the ceramic technology till the present time. The interest in *artesanías* and their exotization has been maintained, so that now these two aspects are the most important incentives of the traditional ceramic industry (see e.g., Barbosa 2005; Gouy-Gilbert 1987; Moctezuma 2002; de la Vega 2007).

In the last decades there have also been important changes in the relationship between the Mexican government and indigenous culture (Bonfil 1987; Díaz-Polanco 1991; Dietz 1995). Such changes have had effects on the material culture as well. *Indigenismo*, those actions of the state in relation to that part of the population considered as indigenous (Dietz 1995:19), was institutionalized at the beginning of the 1940s. From that time the *Instituto Nacional Indigenista* (INI), and after its dissolution in 2003, the *Fondo Nacional para el Fomento de las Artesanías* (FONART) have carried out a number of projects to promote the development of indigenous communities. In the case of communities specialized in pottery, these programs have mainly fomented the production of ceramic *artesanías*. Those projects have promoted technical changes to make production more efficient, and have introduced new morphological and decorative canons in accordance with urban or tourist tastes creating new 'typical' or 'traditional' styles. As we will see later, in recent years those development programs have had an important impact on the central Mexican ceramic-technology.

Furthermore, in the last decades material culture in general has been dramatically modified in central Mexico. Plastic and other new materials have in large part substituted clay, wood and basketry. In addition, new stylistic preferences have been developed as a consequence of the access to other cultures, due to migration, television or internet. In this context the ceramic-technology has in my opinion followed various directions. In some cases potters have been concentrated on the manufacture of domestic artifacts, which are actually used for quotidian household activities, mainly in rural areas but also in cities. The reason is that some people still prefer to cook in clay vessels, as in many places it is still well-known that beans taste better if they are cooked in clay *ollas*, and the same is the case for coffee or *mole*. This is, however, a relatively small market (see e.g., Arnold 2008; Barbosa 2005; Engelbrecht 1987; Lackey 1981; de la Vega 2007). In

other cases, potters have dedicated to the production of domestic artifacts as well, though they are not only for supplying households but also for a new niche associated with traditional Mexican culture. That is, in urban contexts many restaurants specialized in traditional Mexican food use 'typical' wares for serving; also *piñatas* are becoming more popular and are even exported (e.g., Papousek 1981, 1984). In contrast to the domestic market, this is now a flourishing sector. In other cases, potters have reoriented their production to the tourist market, and elaborate souvenirs, 'typical' *artesanías*, flower pots or imitations of archeological objects (see e.g., Gouy-Gilbert 1987; Moctezuma 2002). This is also a growing, and better remunerated, market. These blooming industries are, however, confronted with important challenges, such as the scarcity of fuel and the exhaustion of clay banks. As we will see later, they have developed several strategies to adapt to those situations.

Majolica wares are still produced in the city of Puebla but they do not have the same relevance as in colonial times. They are now directed at the tourist market and have also been transformed into *artesanías* but with an urban character. Majolica vessels were the fine serving wares of the colonial period; today this position has been replaced by a variety of objects of different materials, such as porcelains, stoneware or glass vessels. At present serving wares are still a means to show one's own position in society, although there are also so many other symbols for this purpose that ceramics are not particularly important. Majolica wares are still made with the potters' wheel; usually in different workshops from the lead glazed ceramics. However, they are only one kind of container among the large variety of contemporary material culture.

Even with all these changes, ceramic-making is today in a number of pottery towns a vigorous industry with prospects for the younger generations. In those places potters have incorporated technological innovations to facilitate the production, and have adapted the vessels' repertoire and their decoration to the preferences of the consumers. Nevertheless, several aspects of the ancient methods of manufacture have been maintained and still connect this industry to the pre-Hispanic past. In that way the products are still indigenous-style ceramics.

Sources to study present-day ceramics

The central Mexican ceramic industry is alive. Thus, potters offer us the opportunity to observe their work, and to ask about the reasons for their choices during the production sequence. In the last decades the manufacture of domestic pottery to supply local and regional markets has concentrated in a number of towns distributed in the several valleys of central Mexico. This study is focused on several of these towns, in particular on those in which this activity represents today the main source of income for many families and knowledge is still transmitted to younger generations. These towns are: Amozoc and San Miguel Tenextatiloyan in the state of Puebla; Metepec, *barrio* de Santa Cruz Texcoco, Santa María Canchesdá, Santiago Cochochitlan and San Juanico in the state of Mexico, and Huasca in the state of Hidalgo. The study of the ceramic technology in these towns is based on several visits, at different periods of the year, and consulting several family workshops. In the same way as in the study of ceramics, research in these towns was not intensive, also not systematic or quantified in statistical terms. This part of the study aimed to obtain an impression of the situation of several pottery towns in central Mexico, and not to create a detailed ethnographic register. The observations below presented are not supported by statistical data. This is because in my opinion the particular circumstances of a workshop when I visited it (e.g., if the men form vessels or not, if children help or if workshops have mechanical tools) correspond to a particular moment in its history. Even when I consulted a workshop several times during various seasons, I have seen that the organization of production may be easily modified according to particular events. As this was not a long-term study, I believe it is better to report the observations as impressions rather than as statistical facts. This is also more coherent with the previous chapters on ceramics, in which information was not systematically registered. The observations recorded in this and the two previous chapters are nevertheless useful as they integrate data to suggest a panorama of ceramic-making in the region during a long period of time. The main emphasis of this part of the study was placed on the documentation of the present situation of this industry, although potters also gave many details of the development during the last twenty years. In addition, in some of these towns there have been previous anthropological studies. That research, together with potters'

accounts of the past, offers insights on the changes in ceramic-making during the last years.

In all these towns the ceramic industry has a particular expression. Amozoc is a town located twenty kilometers from the city of Puebla in the valley of Puebla, although it is now part of the urban periphery of that city. Close to the town there are several banks of clay but potters do not have free access. They have to buy it and pay for the transport. Around forty families are now ceramic makers. The town has specialized in the manufacture of large lead glazed *cazuelas* for *mole*, which are regionally renowned and are distributed to many parts of the country. Nevertheless, potters also produce common domestic lead glazed implements, such as *ollas*, small pitchers and bowls, as well as low-quality *ollas* for *piñatas*. A few potter families are also dedicated to agriculture but this is changing as the town and their fields are rapidly being absorbed by the city. In this town migration to the United States is not common. The focus of attraction is Puebla; many people go there to work or study. Potters explain that in the last twenty years the ceramic industry had been decaying, as many young people did not want to continue this hard task and preferred to study or to work in the city. However, in the last couple of years urban unemployment grew, so some persons who learnt pottery as children are now reactivating this activity. Ceramic-making is hard physical work in Amozoc. Clay is chopped and mixed by hand, and this is not only time-consuming but requires an enormous amount of energy. Before the 1980s there were other places close to the city of Puebla specialized in ceramic-making, like the *barrio* de la Luz and the *barrio* de la Acocota (Espejel 1975:65; Kaplan 1994), but this activity disappeared when these locations were absorbed by the city.

San Miguel Tenextatiloyan is the most important producer of domestic pottery in the state of Puebla. It is located around 200 kilometers north of the city of Puebla directly on the road that connects that city with the northern part of the state of Puebla. There are circa 3,000-4,000 potters in the town, which means that around 80% of the inhabitants are dedicated to this activity. Many older people speak Nahuatl. Clay banks are close to the town and are located in communal land; therefore potters do not have to buy it, although they have to pay for the transport if they do not have a truck. The town is specialized in the manufacture of lead glazed domestic implements, such as *ollas*, small *cazuelas*, bowls, small pitchers and flower pots, which are distributed to many regions in Mexico. Many potter families also

dedicate to agriculture as the valley of Zautla, where the town is located, has place for maize fields. Some other families are fully dedicated to ceramic-making as this industry is flourishing. Young people continue to be involved in this activity. In recent years there have been several state programs of development which have promoted a number of innovations to make the production more efficient. They have introduced electric mills and mixers, encouraged the construction of fuel-saving kilns, and offered courses.

Metepec is a town already incorporated into the urban peripheries of the city of Toluca. Several families continue with the manufacture of lead glazed domestic implements, although other potters have specialized in the production of *artesanías*, such as the well-known *árboles de la vida*, figures and imitations of archeological pieces. In fact Metepec is now renowned for the manufacture of *artesanías*. Clay banks are located close to the town but potters do not have free access, they have to pay for the clay and the transport. Workshops specialized in domestic lead glaze wares are mainly located in the *barrio* of Espíritu Santo, and produce primarily *cazuelas* and *ollas*. In the 1970s Metepec was known as the most important production center in the state of Mexico (Chávez and Camacho 1997; Espejel 1975:39; Huitrón 1962), but this has changed. Now young people continue to be involved but many of them prefer to study or to go to work in Toluca or Mexico City. Also the town is becoming more specialized in the production of other better remunerated *artesanías*, such as furniture.

The *barrio* of Santa Cruz in the town of Texcoco has also been incorporated into the urban periphery. This town is around twenty kilometers from Mexico City but it will soon be absorbed into the metropolitan area. This is the only place in the surroundings of Mexico City where ceramic-making is still practiced. Other places, like Cuauh-titlan, the renowned pottery center in Late Aztec and early colonial times to the north-east of the city, is no longer dedicated to this activity. Silvia Rendón (1950) reports that in 1950 this town was still dedicated to ceramic-making. However, several years ago the use of kilns was prohibited due to the proximity to urban habitation. One of the last potters, the family Payares from the *ejido San Mateo Ixtacalco*, still has a kiln and tools but they now dedicate to the manufacture of paper *piñatas*. In Santa Cruz Texcoco ceramic-making is also shrinking. Two decades ago there were around fifty potters but at present only seven families are devoted to this activity. These potters are

specialized in the production of domestic lead glazed wares such as *cazuelas*, *ollas*, bowls and flower pots. Most of the potters also have agricultural fields. Now young people prefer to study or to work in Mexico City.

Santa María Canchesdá, Santiago Cochochitlan and San Juanico are three pottery towns close to the city of Temascalcingo in the north-west of the state of Mexico. They are now the most important producers of lead glazed wares in this state, and their products are widely distributed in the country. Although these towns are only three kilometers separated from each other, they have their own specialization. In Santa María are mainly manufactured *cazuelas*, *ollas* and bowls; in Santiago flower pots, and in San Juanico *ollas* for *piñatas* and roof tiles. In the three towns many adults speak Mazahua. According to a previous study in the area (Papousek 1981), at the end of the 1960s ceramic-making was almost exclusive of the Mazahua population, and potters had difficulties with the distribution of their products as urban markets were far away and only a few brokers had trucks. However, Papousek (1981:75) himself recognized that this situation began to change in the 1970s. Today we observe several differences to his early descriptions. The highway that connects Mexico City and Michoacan is very close to the towns. A large part of the population, not only the Mazahua, is devoted to this activity and young people are involved and have their own workshops. Migration to the United States is not a central concern as is the case of other towns in the state of Mexico. Clay banks are close to the towns but potters have to buy it. State programs of development have introduced electric mills and have tried to substitute lead glaze with a non-lead glaze but without success.

The town of Huasca is twenty-five kilometers to the north-east of Pachuca in the state of Hidalgo. In a sector of the town there are several families specialized in the manufacture of lead glazed wares for domestic purposes such as *cazuelas*, *ollas*, small pitchers and bowls. Potters explain that in the last twenty years the ceramic industry had been declining but at present it has a new impetus. In the past there were only six potters while today there are thirty-eight, and some of them are young people. State programs of development have arrived in the town although they are still in the early stages. Some potters are now changing the orientation of their production; instead of making domestic implements they are concentrating in the manufacture of low-quality small pitchers made by wheel to serve alcoholic beverages at fairs.

These towns are not the only locations of ceramic production in central Mexico. For example in Tlayacapan, in the state of Morelos, potters are specialized in the manufacture of lead glazed objects for domestic purposes and for the tourist market (Barbosa 2005). Also Chignahuapan in the state of Tlaxcala is concentrated in the production of lead glazed domestic artifacts. There are also a few other places where this industry has followed different directions. For example, in Los Reyes Metzontla, close to Tehuacan in the state of Puebla, potters have specialized in the production of fine domestic and decorative objects for the urban market, which are formed, finished and decorated according to pre-Hispanic techniques (de la Vega 2007). Until recently this activity was concentrated in the production of *comales* and was only to complement the income obtained by other means outside the town, as many inhabitants were day laborers. However, state programs of development began to distribute these ceramics in Mexico City and other cities, created competitions to stimulate artistic creativity and organized courses for young people. The result was that many families began to make pottery, and that production was reoriented to the decorative market. Today potters of Los Reyes win national contests and are considered as a model of sustainable development.

There are also other places where the ceramic industry is still present but will probably soon disappear as knowledge is not being transmitted to younger generations. For example, in San Pedro Tlaquilpan, close to Zempoala in the state of Hidalgo, and in Santiago Casandéjé and in Basoco, close to Temascalcingo in the state of Mexico, the last potters are older people who no longer work. In San Juan Coajomulco, also close to Temascalcingo, and Tepexoyuca, south of the city of Toluca, in the state of Mexico pottery is only occasionally made by older people. There are several reasons for the interruption of this craft. First, young people now prefer to study or to migrate to nearby cities and even to the United States. Also this industry was reoriented after pottery lost its prominent place in domestic contexts; thus production centers are now concentrated in a few locations with easy access to the main trade routes. In addition, in some towns the scarcity of clay or fuel and the proximity to urban centers have been important restrictions. Those places where ceramic-making is disappearing will be considered in the following study, although the focus of attention will be the towns in which pottery is today a living industry.

Organization of ceramic production

Today ceramics are made in family workshops, and they are concentrated in a few towns specialized in this activity. The workshops are part of the houses; in some cases they are an extra room dedicated to this activity although in other cases the workshops are also the living rooms. The house *patio* is also part of the workshop; in this area the clay is stored, dried and mixed, the vessels are dried, the kiln is located and the fuel, molds and other related implements are stored. Usually space is limited, thus everything has to be well distributed and potters have to plan the production process. Potters use simple tools, such as different kinds of stones for polishing, and fragments of metal, plastic and clothes for cutting and polishing.

The present-day family workshops are the basic unit of production, and accordingly the social and work relations between their members are complex. In central Mexican pottery towns usually all family members are involved in this activity. As a rule, those parts of the production process which involve extreme physical effort are performed by men, in particular, collection and preparation of clay, while other stages of the process often involve participation of women and children, especially the decoration of vessels. In practice task division in every workshop is, however, more varied, as it is associated with the existing family circumstances and means of subsistence. For example, in some workshops the whole process of manufacture is conducted by the men while the women and children only help to glaze and decorate the vessels. In contrast, in other workshops women perform the entire production sequence while men are day laborers in the cities. Between these two extremes there is a lot of variation. In addition, the division of task among the men or the women participating in the workshop is varied. In some cases every member has a different task, for example the father forms the vessels while the sons mix the clay, but in other cases every one can perform different tasks. In some pottery towns the massive migration in search of work to the cities and to the United States is changing the family organization of work, for example in Zipiajo and Patambán in Michoacán (see e.g., Moctezuma 2002). However in the towns visited for this study migration is not yet extensive, thus many families have maintained the traditional organization.

In the same way as gender division, distribution of tasks per generation is complex and depends on the situation of the family. Older

people often continue forming vessels, and children on occasion help in minor tasks such as applying the glaze. Young people who study or work in another profession normally do not participate. Thus, often young persons involved in this activity are those who did not want to study or did not find a job outside the house. On occasion other relatives also participate in the workshop. Although ceramic-making is fundamentally centered on family workshops, in some towns the production began to be segregated. That is, some workshops are now specialized in the forming of vessels and the first firing, and then the products are sold to another workshop in which the second firing is conducted. Even in some workshops vessels are only dried and sold to other workshops with big kilns in which the first and second firings are done. The main reason for this development is the high cost of fuel, which is not affordable for all potters. Also the intermediaries play an important role, as they pay such low prices for the vessels that potters' suppliers are not able to buy fuel. Thus, on occasion intermediaries also have kilns and buy non-fired vessels. Papousek (1981) observed this situation in the towns close to Temascalcingo in the 1960s and 1970s, and it is still evident today.

In some of the towns potters are also peasants, thus the production of ceramics is adapted to the agricultural cycle. Ceramic-making can be well combined with the work on the fields and with other domestic activities as the process of manufacture involves many periods of inactivity. In the same way as agriculture, this work is seasonal. During cold and rainy months pottery is produced less as there are more risks. Frost and rain can damage, or delay, the drying of the vessels. Those months in contrast are better for agricultural work. In addition, the market dictates several seasons. From September to Christmas the production of *ollas* for *piñatas* increases as they are required for the *posadas* and other Christmas festivities. Also the main local fairs promote the manufacture of domestic utensils. In the case of Los Reyes Metzontla the annual contest organized by the FONART in August stimulates the production notably.

In the pottery towns of central Mexico there are a number of activities associated with the ceramic industry which are also important means of subsistence for other families. In every town there are several families which sell *greta*, the powder for lead glazing. It is often bought in Mexico City although the majority is produced in the northern city of Monterrey. Other families sell and transport clay, others sell fuel, like wood or sawdust, and other families, which usually are

also potters, make and sell vessel molds. In addition, some families have shops on the road for selling vessels produced in the town and, on occasion, also ceramics from other regions. Despite the occupational specialization, at present in these towns there are no ceramic factories. This form of production, separate from the family, in which several persons are employed and receive a salary, exists in the pottery town of Tonalá in Jalisco (Katz 1977), where the manufacture of ceramics in the last fifty years has notably expanded as it has been reoriented to the national and international tourist market. In central Mexico, in the three pottery towns close to Temascalcingo, three factories were created at the beginning of the 1970s promoted by state programs of development but several years later they failed (Papousek 1981:75, 100), and they have not been reactivated. In Santa Cruz Texcoco there is one factory for fine paste ceramics with three employees. These objects, however, are different to the rest of the pottery made in the town as the clay used is very fine, fluid clay cast in vertical molds in order to form vessels, fire is conducted in a reduced atmosphere, and the products are flower pots and figures. That is, this is another ceramic tradition not related to the indigenous tradition. Thus, in the indigenous-style pottery industry, the family has been maintained as the basic unit of production.

At the regional level, the production of ceramics for the national market has been concentrated in a few towns. In the valley of Mexico towns specialized in pottery production in early colonial times, such as Cuauhtitlan, Huitzilopochco, Azcapotzalco and Xochimilco, are no longer places of manufacture as they are now part of Mexico City and regulations to restrict pollution have prohibited the use of kilns. As today the market for domestic artifacts is relatively small, the few towns of central Mexico specialized in ceramic-making have developed their own niches, for example, Amozoc is specialized in large *cazuelas* for *mole*. San Miguel Tenextatiloyan supplies the central Mexican market with smaller *cazuelas* and *ollas* for domestic purposes. Santiago Cochochitlan has specialized in flower pots; Santa María Cancheshdá, Santa Cruz Texcoco and Metepec make *ollas* and *cazuelas*, although every town has its local style. Santiago Cochochitlán and San Juanico are also specialized in *ollas* for *piñatas*. All these towns are concentrated in wholesale although some shops on the road may attract individual clients. In the towns there are several intermediaries who distribute the production to markets and local fairs, and they are on occasion in contact with other intermediaries

who operate at macro-regional level. Sometimes the latter pay their debts with loads of vessels from other regions, thus, in a storeroom of Santa María Canchesdá a collection of vessels from Michoacán can be seen. In this way the different regional styles of ceramics are coming in contact.

In many towns potters do not have formal organizations to represent their interests. In some places we observe that the reason is the presence of middlemen who control the local production. Still, in other places projects of development have stimulated the formation of groups of potters in order to obtain particular goals, for example, the introduction of electric mills or training courses. In Los Reyes Metzontla state programs promoted in the 1980s the creation of groups of potters in order to increase the production and reach new markets (de la Vega 2007:88). In addition, in some towns potters act as a professional group in the ceremonies for the patron saint, in a similar way to the colonial *cofradías* (see Gibson 1964:127-132).

Several stages of the present-day process of manufacturing indigenous-style ceramics in central Mexico can be reconstructed from observation and consultation with the potters. Six stages of the process of ceramic-making will be here approached and compared with the situation in late pre-Hispanic and early colonial times: (a) clay preparation, (b) vessel forming, (c) vessel surface finishing, (d) firing, (e) decoration, and (f) assembling vessel shapes. The information comes from several pottery towns in central Mexico.

(a) *Clay preparation*

As in late pre-Hispanic and early colonial times, in the pottery towns of central Mexico there is little variation in clay recipes. In most of the towns ceramic vessels were made with clay containing sand inclusions. The sand is not added as temper but is included in the clay. Usually potters blend two kinds of clay recovered from the same bank, one with more sand and the other with less sand. Also as in ancient times bigger vessels are made out of clay with more sand particles than smaller vessels. From the towns visited, only in Metepec potters add to the clay dried reed spikes as temper. Potters explain that the reason for this is that local clay is too fine and does not have the required consistence to shape vessels. The use of reed spikes as temper was practiced since at least the early colonial period as it is mentioned

by Sahagún (1992, XI:702-703). However we do not know how extensive this practice was in the past.

Present-day potters do not invest much energy in preparing the clay recipe. Usually they only mix the two sorts of clay brought from the bank according to known proportions. For example, in the Amozoc family Sánchez prepares the clay to make large *cazuelas* with two wheelbarrows of coarse clay mixed with one wheelbarrow of fine clay, and then they add a bit more of one of the clays until the mixture acquires the adequate consistence. However, the next step of the process of clay preparation requires intense physical efforts and is time-consuming. After the clay is blended, potters extend it on the floor and crush it. Then they add water and carefully mix the wet clay in order to insure that moisture and inclusions are evenly distributed. All stones or strange particles are removed as they can cause the breakage of the pot during firing. It is also important that clay is regularly soaked, as differential water impregnation can cause damage to the pot at firing. Potters use diverse techniques and tools to accomplish this part of the production process, but all agree that it is the most arduous. They also explain that this hard work is one of the main reasons why young people did not want to continue in this profession. In some towns, as in Amozoc, clay is crushed with a stick and then carefully mixed on the floor with foot kneading and with the hands (Figure 24). The whole process takes several hours as clay has to be mixed in various cycles. In Huasca potters use, instead of the stick to crush the clay, a big, heavy stone or cement ball attached to a metal pipe (Figure 25). In contrast, in the towns close to Temascalcingo and in San Miguel Tenextatiloyan potters now use electric mills. These machines arrived in the last five years to both towns as part of the state programs of development. Mills notably reduce the time and energy invested in mixing the clay, as dried clay is just placed in the mill, and then a fine powder is obtained. In San Miguel potters now also use electric mixers which uniformly blend clay powder and water. These technical innovations considerably reduce the time and the physical effort invested in this part of the production process. They also insure that the clay blend is homogenous, reducing in that way the damage to vessels during firing. Before the arrival of the electric mills, potters were looking for other alternatives to mix the clay. For example, in the past in Santa María Canchesdá some used horses or a truck for crushing the clay.



Figure 24. Process of clay preparation in Amozoc.



Figure 25. Process of clay preparation in Huasca (Foto by Hermann Stütze).

Thus, clay recipes used today are relatively similar to those of late pre-Hispanic and colonial times. This is mainly because in the valley of Mexico and neighboring regions clays have comparable composition. In the last three decades potters have tried to simplify this part of the production process as they know it is one of the restrictions to making this craft more efficient and more attractive to young people. In recent years new techniques have been introduced, the newest one being the electric mills.

(b) *Vessel forming*

At present in the pottery towns of central Mexico vessels continue to be formed with molds. Although the potter's wheel is known and is present in many workshops, it is not used to form vessels. In most of the towns lead glazed *ollas* and bowls are made with horizontal molds as in pre-Hispanic and early colonial times (Figure 26). Also as in the past, *ollas* are made out of two or three horizontal molds. The three towns close to Temascalcingo are the exception, however. In Santa María Chanchesdá, Santiago Coahuacitlán and San Juanico *ollas* and flower pots are made with two vertical halve-molds (Figure 27), although bowls are made with horizontal full molds. The divergence in the method of forming in these towns in comparison to other pottery centers of central Mexico might be attributed to the influence of a different ceramic tradition. That is, these towns are located only a few kilometers from the border of the state of Michoacan. In late pre-Hispanic times this region of west Mexico was part of the Purepecha kingdom. This territory was a distinct cultural area as language and some cultural traits were different to those of central Mexico; in addition, it was not conquered by the Aztec empire. The ceramic tradition was also different. In pottery towns of the region, such as Tzintzuntzan, late pre-Hispanic potters formed their vessels in a different way to those in central Mexico. Some vessels were made with vertical molds as juncture marks in archeological ceramics show, and others were made with the drawing technique, which involves squeezing the clay between the hands while simultaneously pulling or stretching it upwards. At present potters still use vertical molds in Tzintzuntzan (Engelbrecht 1987:213). Also in another western region, in Tonalá in the state of Jalisco, potters today make pots with vertical molds (Katz 1977:164). Thus, the use of vertical molds in the three towns close to



Figure 26. Process of vessel forming by molding.



Figure 27. *Ollas* made with two vertical halve-molds in San Juanico.

Temascalcingo suggests that potters were in contact with the ceramic technology of west Mexico.

In central Mexico all the potters of a town as a rule use the same forming method. Also the type of mold used and the sequence to form vessels are similar. In the pottery towns of this region clay is applied on the exterior of the mold and a parting agent is used to avoid the clay sticking on it, like dry powdered clay, powdered sand or ash. Molds can be simple or can have a handle in the interior bottom (these are called mushroom molds). Molds can be made of clay or gypsum, and normally a few potters in the town are specialized in their manufacture. Vessels can be completely formed in a mold, for example a simple bowl can be just cast in a full mold and then is ready. Also part of the vessel's body can be formed in a mold and then it is completed or decorated with other forming techniques, for example, a *cazuela* can be made in a mold and then a coil of clay is added to form the rim (Figure 28).

After clay is firmly pressed in the mold, it has to dry for a short moment and then it is separated from the mold. The vessel is normally not fully formed at this stage; potters still need to model the rim, add the neck in the case of *ollas*, or erase the juncture marks of the molds. For these purposes potters have to rotate the vessel. In most of the towns potters use for this task the potter's wheel. They use a wheel made with a single disk with one bearing in order to rotate vessels after they have been separated from the mold, or on occasion when they are still on the mold. Vessels can be placed with the bottom on the disk, or upside-down, according to the section of the body being modeled. In San Miguel Tenextatiloyan the wheel is not used for this purpose; potters rotate their vessels, still on the mold, with the help of a stick attached to the mushroom mold (Figure 29). Large vessels, like the *cazuelas* for *mole* of Amozoc, are too big and heavy to be modeled on the wheel, and for this reason, potters place them on a truck tire and then they themselves rotate around the vessels in order to shape the rim and finish the surface (Figure 30). In every town potters consistently use the same techniques to form and finish their vessels. Also the size and mechanism of the wheels are similar. The knowledge and bodily skills required for forming vessels in the appropriate way are acquired in the family. Potters learn from parents or uncles; usually as children as the workshop is often the core of family life.

Although potters often have a wheel, they do not use it to form vessels with its centrifugal force. However this is not because potters are



Figure 28. Process of vessel forming in Metepec (Foto by Hermann Stützle).

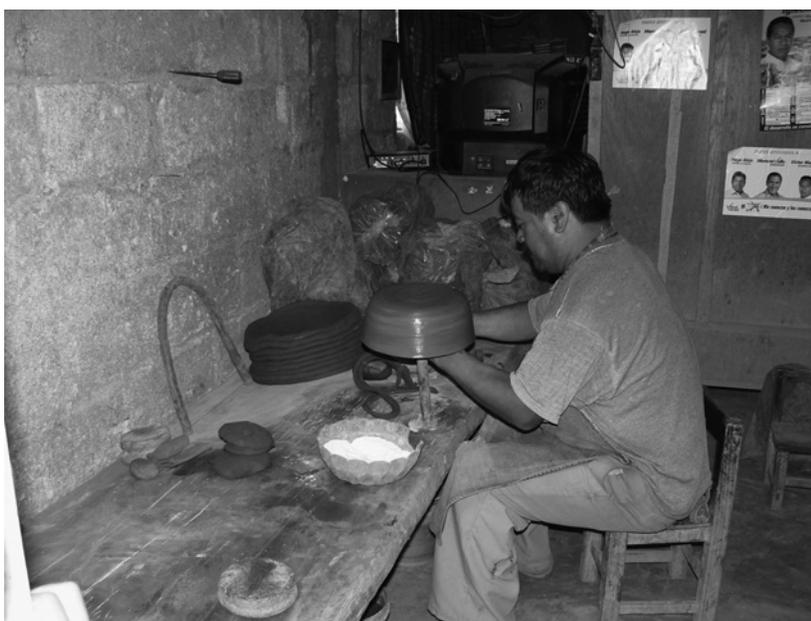


Figure 29. Process of vessel forming in San Miguel Tenextatiloyan.



Figure 30. Process of vessel forming in Amozoc (Foto by Hermann Stützle).

not able to become skilled in this activity. Actually in most of the towns visited, a number of potters know how to use the wheel to form vessels. They learnt this technique in courses given by development programs or, in the case of Amozoc, they worked in *Majolica* workshops in the city of Puebla in which the wheel was used, and they have acquired for their workshops a large wheel with a double disk with two bearings. However, these potters do not use the wheel to form their common vessels' repertoire, like *cazuelas* or *ollas*, because this method of manufacturing does not represent a technical improvement. Potters have experienced that their clay is too coarse for the wheel, and their common vessel shapes can only be correctly elaborated with a mold. As the clay for throwing vessels on the wheel must be fine, it cannot be acquired from the local clay bank, thus potters often need to buy foreign clay with chemical additives. They recognize, nevertheless, that small vessels, like little pitchers or jars, can be made faster with the wheel, and that this is an advantage in the particular case of those vessels. Small pitchers and jars for individual drinking have very low prices on the market, thus potters have to pro-



Figure 31. Small factory for fine paste ceramics in Santa Cruz Texcoco.

duce a large amount of them in order to recuperate the costs, considering that they have to buy special clay. However, these vessels are marginal to the workshop production; because their price is so low, potters prefer to concentrate in other better remunerated objects. Furthermore, in some towns state programs offer courses to learn not only the use of the wheel but also new vessel shapes and methods of decoration. For example, a potter from San Miguel Tenextatiloyan is now experimenting in the manufacture of cups on the wheel, which are then decorated with blue glaze. However, he does not use the wheel to form other vessels, and he does not plan to do so. In these towns the potters who know how to form vessels on the wheel learnt this technique outside of the family. They followed courses or worked in *Majolica* workshops. At present they have not transmitted this knowledge to other family members. That is, this technique has not yet been integrated into the family workshops.

In the towns visited there were no workshops specialized in forming vessels with the wheel, like *Majolica* workshops. Close to Amozoc, in the city of Puebla, there are several workshops and factories for

Majolica wares, but both ceramic technologies remain separate. In Santa Cruz Texcoco one young potter established a small factory for fine paste ceramics (Figure 31). He uses a different forming technique than the rest of the local potters. He pours fluid fine clay, bought specially for this purpose, into two vertical gypsum halve-molds fixed with a cord; he waits until the mold absorbs the water contained in the clay and then separates the molds. He makes figures, flower pots and domestic utensils which are fired in a kiln with reducing atmosphere. This potter learnt traditional pottery from an uncle, and he also worked in a workshop in which the wheel was used, but he did not like those works, and therefore decided nine years ago to establish this small factory. This new ceramic technology has not influenced at all the work of the other potters in Santa Cruz Texcoco. Both traditions remain separate.

Thus, at present in the pottery towns of central Mexico the method of forming vessels is closely attached to the pre-Hispanic and early colonial past. Not only are vessels formed in the same way as in ancient times, but also the required knowledge and bodily skills continue being transmitted through the family.

(c) *Vessel surface finishing*

At present almost all the vessels produced in the flourishing pottery towns of central Mexico are lead glazed. The ancient surface finishing methods, such as red slip, burnishing or polychrome painting, are no longer present. In part the reason for this is the extensive use of lead glaze for decorating vessels. This finishing has now been constituted as the typical treatment of traditional domestic pottery in Mexico (Figure 32). It is easy to apply and considerably reduces the time and effort invested in refining the surface of the vessel after it is separated from the mold. Another reason for the predominance of lead glaze and the disappearance of other methods of finishing is that the present-day traditional ceramic industry has concentrated in the manufacture of cooking vessels and other domestic implements, in which decoration plays a minor role. Today many serving wares are porcelains, fine ceramics, stone wares or glass vessels. Therefore the market for traditional serving wares has been notably reduced, and accordingly their decorative variety has also reduced.

In central Mexico potters used two kinds of glaze; one presents a yellowish tone after firing, and the other a reddish tone. *Greta*, the



Figure 32. Lead glazed wares from central Mexico in the market of Sonora in Mexico City (Foto by Hermann Stützle).

pulverized mixture for glazing vessels is usually composed of one-third lead oxide, one-third silicate and one-third clay. From this blend is obtained the yellowish glaze while the reddish glaze results from the addition of copper to this mixture. Today most of the potters buy the *greta* already mixed in shops or from intermediaries, but potters explain that in the past some persons added the copper to the mixture themselves in order to obtain the reddish glaze. They placed a copper cable in a vessel and fired it; this produced a black powder which was mixed with the regular *greta*. The glazing blend is applied as a slip to vessels previously fired. In general vessels are glazed on only one side. *Ollas* are glazed on the exterior (those for liquids) or in the interior (those for cooking beans) while *cazuelas* and other bowls are glazed in the interior (Figure 33). Practically all vessels of the inventory of the pottery towns of central Mexico are glazed. There are only three exceptions: *comales*, *ollas* for *piñatas* and small jars for serving alcoholic beverages at fairs. *Comales* are per definition not glazed as they require a rough surface and they are continuously exposed to fire. In the second case, *piñata*-makers completely cover the vessel with paper



Figure 33. Application of *greta* on vessel before the second firing in Amozoc (Foto by Hermann Stütze).

decoration, thus they prefer to buy the cheapest non-decorated pots for this purpose. In the third case the small jars are one-way containers for drinks, therefore low price is the most important requirement, and this implies buying a vessel only once fired and without glaze.

In central Mexico an exception to the lead glazed vessels production is Los Reyes Metzontla. Today in this town potters finish the surface of their vessels with burnishing as in ancient times. That is, they carefully smooth the dried vessels with a river stone until the surface is shiny (Figure 34). The result is a lustrous vessel in which burnishing marks are visible. This technique was used in pre-Hispanic times, in particular during the Teotihuacan period (see Rattray 2001). In Los Reyes this method of surface finishing has been stimulated in the last years by state programs. The idea behind it is to promote the production of vessels with pre-Hispanic style for the urban market of *artesanías*, in order to stimulate other means of subsistence in this town in which aridity and poor soils almost do not permit agriculture (de la Vega 2007). For this reason, potters carefully preserve the traditional methods of finishing. However, the case of Los Reyes is special in cen-



Figure 34. Process of surface finishing of vessels in Los Reyes Metzontla.

tral Mexico. Vessels with lead glaze are made everywhere, even in the towns where the ceramic industry is today not flourishing but disappearing. For example, in the *barrio* of Coapanoya in the town of Tepexoyuca, close to Toluca, a very few older potters still occasionally manufacture *ollas* in small workshops with small kilns, but these vessels are lead glazed.

For several decades the health dangers associated with lead glazed ceramics have been studied (e.g., Jones 1975; Kaplan and Spielholtz 1977; Rojas and Santos 2004). In particular the green glaze, typically used in the pottery town of Atzompa in Oaxaca, is considered toxic. However in this aspect there is still much discussion, as the effects of lead on the blood are long term and it is difficult to differentiate them from other health problems of potters and consumers, such as malnutrition. In addition, the supposed toxicity of lead glazed vessels has motivated the United States to prohibit the import of ceramics from Mexico. Besides the possible health dangers, this situation has impacted the economy of some pottery towns, in particular in Atzompa, as the international tourist market has been notably

reduced. In central Mexico, however, the dangers of lead are not yet a main concern, either for potters or for the vessels' users. The toxicity of lead ceramics has not yet been made a public topic in Mexico. In addition, as most of the ceramics produced in the pottery towns visited are for the national market, and especially for domestic purposes, the reduction of the international tourist market has not been a main problem. Still, this situation has promoted the implementation of state programs to replace the *greta* with a non-lead glaze, called *esmalte*, in the pottery towns of central Mexico. This new glaze has been introduced in Santa María Canchesdá, Metepec and Santa Cruz Texcoco but without success. Potters explain that *esmalte* has a matte appearance and therefore customers do not like it. Also the mixture is difficult to obtain, and the vessels require more careful control of the kiln temperature. Thus, at present this non-lead glaze is still in testing phase.

Red wares are no longer produced in central Mexico, although Silvia Rendón reports that in 1950 in Cuauhtitlan potters still manufactured vessels with red slip, and no glaze (Rendón 1950:259-260). The ceramics from Tonalá, which in the late colonial period became very popular (Charlton and Katz 1979), are still manufactured and traded to central Mexico, but they are mostly *artesanías* rather than domestic vessels, and they are not as popular as in earlier times. In many contexts this kind of serving ware has been replaced by vessels of other materials, and with lead glazed vessels. Thus, vessels' surface finishing has notably changed since late pre-Hispanic times.

(d) *Firing*

At present in the pottery towns of central Mexico vessels are fired in two-chamber updraft kilns as in the pre-Hispanic and colonial past (Figure 35). Although the same firing principle is used and kilns look quite similar to those of ancient times, potters have implemented in the last decades several technical innovations to make these kilns more efficient. The reason is that today fuel is limited and expensive, which makes it one of the central problems of ceramic-making. This is particularly important today as most of the ceramic production is fired twice. Most of these changes have been directed to reduce the fuel costs although the same type of kiln has been maintained. In addition, the firing costs are so high that this part of the process of manu-



Figure 35. Process of firing in Metepec (Foto by Hermann Stütze).

facturing determines in major part the schedule of the workshop. That is, the kiln is only fired when enough vessels and fuel are available.

In the pottery towns of central Mexico two-chamber kilns present great variation in size and structure. There are big kilns of two meters diameter and three meters depth but also small kilns of 1,5 meters diameter and 1,5 meters depth, and a lot of variation in-between. Also kilns have different building materials; they can be made of stones, bricks or adobe. In some kilns the firebox is below the chamber for the vessels while in others it is separate. The size of the firebox also varies a lot. Some kilns are completely above the surface, while others have the firebox below the surface. Some kilns have a metal roof on the top to protect them from rain as it may damage the vessels during firing. However, in all of them the firing principle is the same; the chamber where the vessels are placed functions as a chimney for the firebox. Air, flames and combustion rise from the firebox to the chamber and exit through openings at the top of the kiln. In general in a pottery town there are kilns of different sizes and constructions. The kiln is located in the patio and usually potters have only one kiln, although on occasion potters may use as well the kilns of other workshops.

Traditionally firewood has been the main fuel to fire vessels, however in the last decades it has become scarce. Excessive felling of trees and little reforestation in the areas close to the pottery towns has made this resource very limited. For this reason, at present in many regions it is prohibited to cut down trees in communal land. Wood is still available but it is expensive. Potters have reacted to this situation in several ways. Some have changed the fuel, for example, instead of wood they use twigs and leaves, sawdust or waste wood from construction. Some potters have even begun to fire with plastic industrial waste and tires, but this is limited to the manufacture of flower pots, not for cooking vessels. This is the case of Santiago Coahuacatlán, which has specialized in the manufacture of flower pots and uses this kind of fuel in the majority of its workshops. Potters have also reacted to the scarcity of wood in another way; they have constructed bigger kilns with larger fireboxes in order to fire a larger amount of vessels in one session. They also invest a lot of time in filling the kiln with as many vessels as possible and in the most efficient way.

Recently state programs have also introduced technical innovations for kilns in order to make them more efficient. For example, a few years ago in San Miguel Tenextatiloyan the construction of metal covers for kilns and the use of high temperature bricks and isolation for kiln walls was promoted. Many potters have now modified their kilns according to these new ideas as they have seen that they permit them to fire more efficiently. State programs have also promoted the use of gas kilns but they have not been well accepted. This kind of kiln is based in the same updraft principle but the fire comes from a burner installed on the firebox. Potters from Santa Cruz Texcoco explain that gas is also expensive and that the control of temperature is different than in wood kilns and for this reason, loads of vessels are lost until they have enough experience to operate this kiln properly. Also in the pottery town of Tlayacapan in the state of Morelos development projects introduced gas kilns at the end of 1990s but potters stopped using them after several attempts (Barbosa 2005:135). The main reasons were that the dimensions and design of these facilities did not take into account the diversity of production volume and the size of the workshops, the lack of instruction to use them, and the high costs of fuel.

Some potters have reacted in a different way to the scarcity of fuel. As wood and other forms of energy have become too expensive, they did not make firing more efficient, but stopped firing. That is, they sell

their dried vessels, not fired, to other potters who have large kilns and finish the process of manufacture. Thus in many towns the production of ceramics begins to be segregated, and some potters, or middlemen, have specialized in firing the vessels of other potters. Also, other potters have specialized in the production of *ollas* for *piñatas* as they are low quality vessels without glaze, that is, they are fired only once and at relatively low temperature. The problem of fuel scarcity is present in many decisions taken by potters. For example, potters invest a lot of time in the preparation of the clay because they carefully remove large sand inclusions and other foreign particles that may cause damage to the vessels during firing. Also potters control in detail the shape and dimensions of their inventory of vessels because they want small pieces to fit into big pieces in order to form a nested pile that can be efficiently accommodated in the kiln. In addition, potters sell cracked vessels to *piñata* makers, as second class wares. That is, potters use a variety of means to make the process of firing more efficient.

In Los Reyes Metzontla potters fire *comales* in open fires, but this is exceptional in central Mexico. They place a metal structure on the floor in which *comales* are arranged, then they cover all the sides with wood and fire the vessels. In this town, however, only these utensils are fired in this way; potters have two-chamber kilns to fire the rest of their production. In other places, workshops for Majolica wares and fine clay ceramics also use different firing methods. Usually this kind of object is fired in gas kilns with a reductive atmosphere. The kiln is not round but square, the top is closed and has a chimney, and vessels are introduced through an aperture on the side which is closed during firing; thus the circulation of air is very limited. This firing technology has been maintained separate from the two-chamber updraft kilns.

Thus at present the firing technology in the pottery towns of central Mexico is based on the same type of kilns as in the late pre-Hispanic and early colonial periods. Today this part of the process of ceramic-making is marked by scarcity of fuel. The high cost of combustibles is one of the main concerns of the family workshops. For this reason, in the last years potters have implemented technical innovations to make kilns more efficient although their technical principle has been maintained.

(e) *Decoration*

At present in the pottery towns of central Mexico the form and function of decoration is clearly different to pre-Hispanic and early colonial times. Most of the adornment of the vessels is centered on the application of lead glaze. This surface finishing has replaced other techniques such as incision, stamping or applications. Often lead glazed vessels are also decorated with painted motifs, but these are usually simple, schematic and hastily done (Figure 36). Decoration is as a rule not meaningful and it is not a medium to transmit important concepts as was the case of pictography painted on fine late pre-Hispanic vessels. In a few cases we can say that vessels are media of literacy as potters might paint a brief text, like *Recuerdo de Texcoco*, although the function of this writing is probably very different to the function of pictography in pre-Hispanic polychrome vessels in which ritual and religious notions were depicted. Likely the texts on both ancient and present-day vessels refer to the context in which these objects were used. However, in my opinion, ancient pictographic writing conferred to the vessel a special character. Pre-Hispanic writing was not only a means to transmit information but also a religious and aesthetic experience, and even a vitalizing act (see Houston 2004:8; Jansen and Pérez Jiménez 2009:476).

In general, decoration today is not important; it is often so simple that dexterity is not required, so it may be done by children or other occasional helpers in the workshop. In the pottery towns of central Mexico ceramics are sometimes only decorated with a coating of lead glaze. However, it is more common for potters to embellish vessels with glaze and with painted motifs. Painting is usually in black and yellow color but white and green can also be used. It is applied to the vessel in different ways; it can be dropped on one side of the vessel's surface to produce irregular lines or spots; it can be painted with a brush, or it can be stamped with a metal seal made by the potter (Figure 37). The painting is bought already prepared as a powder and is mixed with water or fluid clay. It is applied on vessels previously fired once, before or after the application of *greta*; after that, the vessel is fired again and the final color is obtained. Although painting motifs are simple, every pottery town has its own characteristic decoration. For example, in Amozoc *cazuelas* and *ollas* are decorated with vertical black lines hastily dropped from the rim to the vessel's bottom. In Metepec *cazuelas* and other bowls are decorated with a band of yellow



Figure 36. Decoration of *ollas* in San Miguel Tenextatiloyan.

geometrical and curvilinear motifs stamped on the interior walls and/or black thick lines hastily brushed on the vessel's bottom. In San Miguel Tenextatiloyan *ollas* are painted with bands of thin black geometrical patterns of lines while *cazuelas* often have black vertical lines dropped from the rim. In Santa María Canchesdá bowls are decorated with black painting forming flowers, curvilinear motifs and lines on the walls and rim. In Santa Cruz Texcoco potters decorate their *cazuelas* and *ollas* with black, and often also yellow and green painting, forming curvilinear motifs or flowers in the vessels' walls or bottom. In Huasca bowls and *ollas* are often decorated with white painting forming schematic flowers, curvilinear motifs or lines. Santiago Coahucochitlan is an exception as potters make flower pots decorated with raised flowers produced by carvings made into the molds, and the vessels' exterior side is covered by lead glaze or is painted with acrylic colors. In all these towns painted motifs and patterns are not similar to the decoration of pre-Hispanic vessels. They are also different to the early colonial decoration, and do not show correspondences with Spanish-style vessels of that time either, like Majolica wares. Early colonial lead glazed vessels were also decorated but the techniques



Figure 37. Methods and styles of decoration in: (a) Amozoc (b) Metepec (c) Santa Cruz Texcoco (d) Santa María Canchesdá (e) Huasca and (f) Santiago Coahucochitlan.

and motifs used were distinct from the present ornamentation. Those early vessels were often only decorated with glaze, but on occasion they were also embellished with patterns of lines incised on the leather-hard surface which after a first firing were covered with the glaze slip, or with applications of flowers pasted to the vessel before the glaze slip.

Today every town has a distinctive style of decoration, which is clearly identifiable by potters, traders and the vessels' users. In every town, however, every workshop produces its own version of the local style. For example, some potters prefer certain motifs or prepare *greta* or painting in different concentrations from their fellows. In that way potters can often recognize who manufactured a particular object. Thus, decoration is not made to be meaningful but is an index. That is, it indicates who the maker was and in which workshop the vessel was produced, although this information is only understandable to those well-familiarized with the pottery of a particular town. Decoration also indicates in which town the vessel was made; this information is more accessible to customers and users of vessels from other regions as local styles are quite distinctive.

In recent years the wide distribution of vessels to many regions of the country and the exchange of vessels from different towns through intermediaries has promoted that various local styles come into contact. Intermediaries, and often potters, know how the decoration of vessels in other pottery towns of the region is. They also know which motifs are popular. Nevertheless, pottery towns have maintained their regional style. For example, in Santa Cruz Texcoco in 1975 potters decorated *ollas* with flowers and lines in a relatively similar way to the present time (see Espejel 1975:53). Also at that time in San Miguel Tenextatiloyan *cazuelas* were decorated with groups of lines as they are today (see Espejel 1975:55). However, in this town potters have begun in the last years to decorate some of their vessels with bands of white dots forming geometrical motifs, which imitate the traditional decorative style of Michoacán vessels, as these ceramics are now very popular. In contrast, in Santa María Canchesdá some potters are now experimenting with acrylic colors introduced by the FONART, such as blue, red and green colors which are then covered with *esmalte* rather than with *greta*. This new painting has not motivated changes in the patterns of decoration, however. Potters represent the same well-known motifs as before. Thus, in these towns the vessels' decoration is involved in different dynamics of development.



Figure 38. Shapes of vessels made in Santa Cruz Texcoco.

In comparison to pre-Hispanic times, today the decoration of this kind of vessel seems to be less important for potters and consumers. In part the reason for this is that these vessels are mostly for common domestic uses, such as cooking, storing and serving. However, in part it is also because the function of decoration has changed. Patterns of lines, geometrical motifs and flowers are entirely for embellishing the vessels. Potters do not use them to communicate particular messages, although this does not reduce the indexical character of decoration.

(f) *Assembling vessel shapes*

In the pottery towns of central Mexico the present-day inventory of vessels is in several aspects different to that of pre-Hispanic and early colonial times. Common domestic ceramics for cooking have maintained their ancient basic shapes but potters have incorporated minor variations in formal details (Figure 38). Also several typical Mesoamerican vessel shapes, that continued to be made during the early colonial period, are today no longer produced. This is the case of tripod *molcajetes* but also of a number of serving vessels for individual

eating and drinking. In addition, new vessel shapes for new functions have appeared in association with new food habits. Potters are also willing to produce completely innovative shapes, for new functions, if customers request them. These trends in the repertoire of shapes of present-day traditional ceramics are in large part associated to the popularity of other kinds of domestic material culture. That is, traditional ceramics represents only one category of objects among a variety of implements for household purposes made of metal, plastic, glass, fine ceramic or porcelain. In this variety of artifacts, traditional ceramics have been oriented to particular domestic uses, such as cooking traditional food, and to supply the urban market specialized in typical Mexican food and customs.

Today common vessels for cooking and transporting continue to be *ollas*, *cazuelas* and *comales*. Their basic shape is the same as in pre-Hispanic times, although minor formal details have been modified, such as the shape of the rim or the inclination of the walls. Many of the shapes currently produced are made in the same way as in the 1970s, as previous documentations show (e.g., Espejel 1975; Kaplan 1994; Papousek 1981). Also as in the pre-Hispanic and colonial past, a particular vessel shape is today made in several dimensions. Domestic vessel shapes produced at present are mainly for food preparation, like *ollas* for cooking beans or coffee; *cazuelas* for cooking different kinds of stews and *moles*, as well as *comales* for baking tortillas. This kind of vessel is mainly for customers who prefer to cook in traditional style. Potters also produce collective serving wares, like large serving bowls and *ollas*, as well as *ollas* for *piñatas* and flower pots, which are often directed to supply the urban market. In contrast to pre-Hispanic times, individual serving vessels have been notably reduced. Potters still manufacture small pitchers or plates, but this is a minor part of their production as these forms have a very low price on the market and potters prefer to concentrate in better remunerated objects. In addition, people today favor plates and bowls of other materials for individual consumption. Thus, the present-day variety of individual vessels is more reduced than in pre-Hispanic and early colonial times.

In addition, some vessel shapes and formal attributes are no longer made. For example, bowls with tripod supports, once characteristic of the late pre-Hispanic ceramic culture, are today not produced. This includes the tripod *molcajetes*, distinctive of the Late Aztec period and common in early colonial times. Also vessels with ring bases as in the

early colonial period are not produced. Anthropological documentation in the 1970s shows that these forms were not manufactured at that time (e.g., Espejel 1975). In contrast to earlier times, many vessels today have handles. For example, *cazuelas* have two large handles on the rim and *ollas* often have lateral handles on the shoulders. In addition, new vessel shapes have appeared, like *arroceras* or *paelleras*, to cook rice, or flat bowls to make *fondue* to cater for new urban food habits, some of them now incorporated into the Mexican cuisine. Potters also make flower pots and simple *ollas* for *piñatas* which do not have handles or other formal decoration.

Some pottery towns of central Mexico are specialized in certain vessel shapes, although potters may also produce other kinds of objects. For example, Amozoc is specialized in large *cazuelas* for *mole* (Figure 39), Santiago Coahuacitlan in flower pots and *ollas* for *piñatas* (Figure 40), Santa María Canchesdá in small *cazuelas* and other bowls. Within these towns vessel shapes are similar because potters use similar molds, as they are usually made by a few local specialists. Also intermediaries stimulate the production of standardized vessels, as they often acquire and gather the production of several potters to supply a few wholesale clients. In contrast, every town has its own particular version of common vessel shapes. That is, in every town *ollas* and *cazuelas* have distinctive forms of rim, walls or vessel body. Workshops are usually specialized in a few vessel shapes, for example, some potter families make mainly large *cazuelas*, *ollas* or *comales* in several dimensions. However if customers require vessels of a special size or even completely new vessels, they are ready to make them. For example, potters make, on request, lamps, ash-trays or small flower pots.

In the pottery towns visited vessels exclusive for ritual purposes are normally not produced. However, in Amozoc and Santa María Canchesdá a few potters seasonally make censers for the celebrations of the Day of the Dead. These are vessels with a large pedestal base made by mold and decorated with lead glaze in black tone. They are produced in small amounts, only for that occasion, as incense burning is part of the offerings presented to dead relatives at domestic altars, cemeteries and churches. In those towns censers are only a minor part of the production of a few potters, however. The reason for this is not only that they are requested by customers during just a short period of time, but also because in central Mexico other places have specialized in their manufacture. Although censers were common in ancient



Figure 39. *Cazuelas* for mole in a workshop in Amozoc.



Figure 40. *Ollas* for piñatas in San Juanico.

times, the shape of the contemporary objects is not similar to that of the pre-Hispanic or early colonial periods (see Charlton *et al.* 2007). They have, in contrast, some resemblance to early colonial candle holders; in particular in the large pedestal base, the broad base and the size. Thus, it might well be that this kind of censer originated in the colonial period, and that its use was since then associated with the Catholic ritual; in that way it was one of the many manifestations of the religious syncretism of Mesoamerica.

Today the nomenclature of vessel shapes reflects the intertwining of different methods and languages for categorizing material culture. Some of the names come from the pre-Hispanic period, others are colonial and others have been recently adopted. Common vessel shapes have the same name in all places of manufacture, for example, *ollas*, *cazuelas*, *comales* or *floreros*. Some names are derived from Nahuatl, like *comales*, *cajetes* or *tecomates*, but most are in Spanish. Every pottery town in central Mexico has a particular system for naming the different sizes of vessels. Often the nomenclature for the various dimensions of *ollas* is partly different to that for *cazuelas*. For example, in Amozoc, *cazuelas* are named (from the smallest to the biggest): *de a ochito*, *de a diecito*, *de a tlaco*, *de a dos* (*cuartas*, span of a hand), *de a tres* (*cuartas*, span of a hand), *de a medio* (*real*), *de a real*, *dos reales*, *media campana*, *tres cuartos de campana*, *campana y cuarta*. In contrast, *ollas* are named (from the smallest to the biggest): *de a ochito*, *de a diecito*, *de a tlaco*, *de a dos* (*cuartas*, span of a hand), *de a tres* (*cuartas*, span of a hand), *de a medio* (*real*), *de a real*, *dos reales*. In comparison, in San Miguel Tenextatiloyan *ollas* are named (from the smallest to the biggest): *de a cuarto* (of a kilogram), *medio kilo*, *tres cuartos de kilo*, *kilo*, *kilo y cuarto*, *kilo y medio*. In contrast, *cazuelas* are named (from the smallest to the biggest): *de a diez* (*docenas la carga*), *de a ocho* (*docenas la carga*), *de a cinco* (*docenas la carga*), *de a cuatro* (*docenas la carga*), *de a cuarenta* (*piezas*), *de a treinta* (*piezas*), *de a doce* (*piezas*). *Comales* have different names (from the smallest to the biggest): *nueve pulgadas* (nine inches of diameter), *doce pulgadas*, *quince pulgadas*, *diez y ocho pulgadas*, *veintiun pulgadas*, *treinta y tres pulgadas*. These *comale* names are given according to the diameter of the mold used, as it is a ring made with plastic pipe. All these nomenclatures show that present-day potters combine various systems of categorization. Some of them have pre-Hispanic origin, such as the vigesimal system still used as unity of

quantification to name some sizes of *cazuelas*. Others have colonial origin, such as the Spanish system of quantification based on the amount of pieces per load, or on the price of vessels in colonial money (*reales*). Further, other systems have a more recent origin, such as the use of dimension of diameter in inches for naming different sizes of *comales*. Thus, vessels' nomenclature reflects the complexity of the colonial intercultural contact and the process of cultural continuity in the last five hundred years.

In brief, the present-day traditional ceramic technology is the result of several processes of continuity and change that have occurred in the last five hundred years. Over this long period, every stage of the sequence of production has had different developments. The method of forming vessels has been maintained as in pre-Hispanic times. This is mainly because the knowledge and bodily skills required are still transmitted through the family, and are still an essential component of quotidian life in the house-workshops. In spite of the great social changes in Mexico over the last forty years, family workshops continue to be the basic unit of production. The method of forming vessels has also been maintained because the adoption of other methods, such as the potter's wheel, would require larger modifications in technology, like a different kind of clay, method of clay preparation, shapes and surface finishing, and this would imply the end of this ceramic tradition. Nevertheless, in other parts of the production process potters have been creative and open to new technologies and ideas. In firing, for example, potters have maintained the same kind of kiln, based on the updraft and two-chamber principle, but have modified the dimensions of these facilities and have incorporated new technical devices to make them more efficient, as well as new types of fuel. Surface finishing and decoration are also different to those of ancient times. The typical pre-Hispanic decoration, such as black painting on orange background or red slip, is no longer present. The large majority of vessels produced are lead glazed, but they are decorated in a different way from in the early colonial period. The function of decoration is also distinct from in pre-conquest times. Decoration is today simple, hastily done and not made to be meaningful, that is, it is not important. Furthermore, the inventory of vessel shapes is not the same as in ancient times. Some basic shapes for cooking have been maintained as in the past, although potters have modified minor formal details. However, the repertoire of serving vessels is now less varied and typical pre-Hispanic forms, such as tripod bowls, are no longer

made. Also new vessel shapes for new functions have been introduced. These changes in surface finishing, decoration and shape mean that vessels look different to those of pre-Hispanic times. Nevertheless, vessels are formed in the same way as in ancient times, and this task and the method of learning it is still embedded in family workshops. As this part of the process of manufacture is closely related to potters' own conceptions about their technology and their material world, its continuation also implies the preservation of those understandings. In that way the contemporary traditional ceramic technology is a continuation of the indigenous-style technology of the late pre-Hispanic and early colonial periods.

The environmental impact of ceramic-making

Towns specialize in ceramic-making because they are located close to clay sources, and have access to fuel for firing, like firewood. In central Mexico clay banks are recurrent in many regions, and are usually easy to access as they are exposed. In principle, clay and firewood are frequent natural resources, often abundant, and for this reason, this industry may be accessible to a large number of craftspeople. However, access to clay, and in particular to firewood, has been restricted in recent years, so that the supply of these resources is today the main concern for potters. Limited access to clay and firewood is due to high costs or shortage, although both are often related. Adequate clay for pottery is abundant in the region but in many cases it is not freely available to potters; they have to pay for it. Shortage of firewood is mainly the result of inadequate exploitation of woodland and expansion of human settlements. These problems have been accentuated in the last decades, thus firewood is today very scarce. The restriction of these resources has shaped several aspects of ceramic-making and its social context.

Clay banks are usually located in the margins of a pottery town, or within a distance of a few kilometers, and are often in communal lands. In some towns potters have free access to this raw material, but they have to organize and pay for the transport if they do not have a truck. In other towns potters have to pay for the clay, because the bank is in private land or because there are specialists in excavating, cleaning and transporting the clay. Thus, potters often have to pay for

obtaining this resource, and this is expensive. In this region clay is not usually limited; therefore the problem for potters is the cost but not the insufficiency. They have reacted to this situation in several ways. Potters deal sparingly with clay during the whole process of manufacture, even if this implies more time and effort. For example, clay remains from the process of manufacture are carefully collected and reused, or vessels which are cracked before firing are pulverized to use the clay again. They also repair damaged vessels and try to sell imperfect pieces as second class wares. In other regions of Mexico clay is not only costly but also scarce. For example, in Ticul on the Peninsula of Yucatan, clay banks are sparse and difficult to access because they are not at the surface, and they are at risk of exhaustion (see Arnold 2008). Potters have responded to this particular situation in other ways, for example, they have begun to acquire clay from further away sources.

By and large, the most important concern for potters today is the limitation of fuel. Firewood is as a rule scarce in the regions around pottery towns due to inadequate use of woodland resources, lack of reforestation, expansion of agricultural fields and livestock, and growth of human settlements. Part of the rapid deforestation might be attributed to the potters themselves, but also to the activity of charcoal dealers, as was the case in the region close to Temascalcingo in the 1920s and 1930s (Papousek 1981:59). In some cases, this has resulted in firewood no longer being available, because the forest has disappeared or because it is prohibited to cut down the remaining trees and twigs in communal forests. This has obviously increased the cost of firewood. For this reason, potters began to use alternative sources of energy several decades ago. They often use sawdust, but this is also expensive, and it is a quick-burning fuel which does not permit a good temperature rate. Potters also use waste wood from construction; it permits a good temperature rate but it is also expensive and not always available in areas far from urban centers. Also in the 1970s potters began to use petroleum as fuel as at that time, at the beginning of the Mexican oil boom, it was cheaper than firewood (Espejel 1975:43, 53) but this is now in disuse. Also some potters have implemented the gas kilns promoted by state programs of development, but they often desisted as these facilities were not adequate to the volume of their production and required a lot of experimentation to be able to control the firing process. In addition, gas was also expensive.

In the last years in a few towns potters began to fire with industrial plastic waste and tires, but this practice is only for firing vessels not used for cooking or eating, such as flower pots or *ollas* for *piñatas*. Potters explain that this kind of fuel impregnates vessels with a plastic flavor which clients do not like. In Santiago Coachochitlan potters fire with this new fuel as they are specialized in that kind of vessel. However this is not the case in the neighboring town of Santa María, as there potters are specialized in cooking vessels and fire with sawdust. The situation of Santiago is new, but it is a consequence of the human use of the environment over the last five hundred years. In the early colonial period cattle and sheep herds were introduced to central Mexico, reducing agricultural fields, promoting deforestation and impoverishing soils. This was the case in the areas around the pottery towns of Santiago, Santa María and San Juanico, where dryness and high altitude were also limitations for farming. As soils were inadequate for agriculture, people relied more on pottery, and this intensified deforestation. Also other people dedicated themselves to produce charcoal, and thereby accelerated this process.

Other potters have reacted in other ways to the limitation of fuel. Some of them stopped firing, that is, they have concentrated in the production of vessels which are dried and then sold to other potters or intermediaries who have large kilns and finish the manufacturing process. Other potters fire their vessels only once, and then sell them to other workshops in which the second fire is conducted. In particular this last firing is difficult for many potters to afford as it requires higher temperatures to reach the melting point of the glaze. Potters obviously receive very low prices for their unfinished vessels. In addition, the fuel restriction has notably stimulated the production of *ollas* for *piñatas* in the last decades. Many potters now specialize in these low quality products. They are fired only once, at low temperatures, fuel can be plastic waste, and even cracked or damaged pieces can be sold as second and third class wares. However, remuneration is very low, thus it is not a good alternative for potters.

In general potters have adapted their firing technology to the shortage of fuel. They have constructed bigger kilns to fire a larger amount of vessels with relatively less fuel. They gather vessels from several workshops to fire collectively. They also construct roofs in order to avoid the damage of vessels due to rain. In addition, they have adopted some technical innovations proposed by the projects of development

to make kilns more efficient, such as metal covers, high temperature bricks and isolation. Thus, today scale of production, schedule and specialization of traditional ceramic-making are in large part determined by the difficult access to fuel. The disequilibrium between available resources and production is now part of the life of potters. This is not new, however. Papousek (1981:67) reports this situation in the towns close to Temascalcingo already in the 1970s. Espejel (1975:52, 54) observes the same in Santa Cruz Texcoco and valle de Bravo, and Engelbrecht (1975:52) in the pottery town of Patambán in Michoacán during the 1980s. This disequilibrium in the pottery industry contrasts with the situation of traditional agriculture. Still today this activity has a regenerative cycle due to the combination of crops, rotation of fields and use of organic fertilizers. Most of the potters in central Mexico were, or still are, peasants. Thus they were well-familiarized with sustainable use of resources. The present situation of ceramic-making is different. Thus peasant-potters are now looking for new ways to reach the equilibrium between clay, fuel and production, or to survive despite it. For example, in San Miguel Tenextatiloyan there is a recent program of reforestation. Potters explain that in 2009 sixty thousand trees were planted in the near region.

Impact of institutional programs to stimulate ceramic-making

Since the first implementation of *indigenismo* policies in the 1940s the relationship between Mexican institutions and craftspeople, in particular makers of *artesanías*, has been protectionist and authoritarian (see Dietz 1995). This relationship has also been politicized and focused on short-term results, as state programs to promote this sector have often been directed to obtain votes. It has also been bureaucratic, as actions have often been preceded by large periods of time, much documentation and decision-making at several levels. Despite this, numerous projects to improve the economic and social conditions of craftspeople and the conservation of traditions have been carried out. These programs have been directed to solve the main problems of traditional crafts at present, in particular, the insufficient distribution and commercialization of products, the abuse of intermediaries and the lack of access to technical innovations to make production more efficient and less exhausting. However, many of these

projects have failed. Craftspeople and scholars report that programs and their implementation have in many cases been inadequate because they did not adapt to the particular conditions of a community (see e.g., Barbosa 2005; Gouy-Gilbert 1987; Papousek 1981). Also many programs are started but then due to changing political agendas they are not continued. In addition, some programs have promoted dependence on the government rather than economic autonomy in a community, as artisans often receive money from the program to acquire raw materials and then the whole production is bought by the same program. In part, all this is a consequence of the lack of participation of artisans in the creation of programs, as several scholars agree (see e.g., Barbosa 2005:247-273; Dietz 1995:373-377; Gouy-Gilbert 1987:51-57). Nevertheless, there are also positive results. The contact between artisans and institutions has in several cases contributed to improve part of the life conditions in communities where other means of subsistence are difficult.

At present FONART is the national organization which creates and coordinates development programs for craft production. It has mainly focused on *artesanías* with artistic character made by indigenous communities, although also other more common crafts for quotidian uses are supported. The production of objects for the tourist market is particularly important for the government as tourism is today one of the main sources of foreign capital in Mexico. Traditional ceramic-making has obviously been focus of those programs. The first projects were carried out at the beginning of the 1950s. At that time delegates from an organism precursor of FONART tried to introduce in the pottery town of Tzitzuntzan new manufacturing methods and to encourage the production of objects for tourists (Foster 1967). More recently FONART has launched projects in other towns, for example, in Ocumicho in Michoacán where craftspeople are specialized in the manufacture of colorful clay figures (see Gouy-Gilbert 1987), in Los Reyes Metzontla where potters make non-glazed vessels (see de la Vega 2007), or in Tlayacapan in Morelos where potters are specialized in lead glazed objects (see Barbosa 2005). This organization has applied in these towns, and in many other communities specialized in traditional crafts, the same strategy, which is mainly centered on: (a) organization of cooperatives or groups of artisans to represent the community's interests and act as intermediaries with institutions; (b) credits for artisans to acquire technical devices to make production

more efficient, such as electric mills and mixers and high temperature kilns; (c) distribution and commercialization of the production, in particular in the shops of FONART in the cities, and d) preservation of the artistic character of *artesanía* by means of courses and artistic competitions. These lines of action are in fact well directed to resolve the most important problems of present-day traditional pottery. However their implementation has often failed because they are not adapted to the particular context of a community.

FONART has also established contact with several pottery towns of central Mexico specialized in the manufacture of common lead glazed vessels for quotidian use rather than in *artesanías*. The towns visited for this study have been involved with this institution in different ways and at different times during the last decades. For example, in Metepec a state project tried to create cooperatives in the 1950s but it failed (Huitrón 1962:134). In the 1960s a new project was again directed to the formation of cooperatives as well as to promote technical innovations by means of credits and to commercialize the production (Huitrón 1962:134), but those attempts are now part of the past. Today in Metepec state programs no longer promote the manufacture of common lead glazed ceramics, but rather other distinctive *artesanías*, such as *árboles de la vida* made of clay. Cooperatives of lead glazed potters do not exist. Thus, family workshops manufacture and commercialize their products and innovate independently of FONART. In that way this industry has been developed according to current requirements of the market, and for this reason, it has endured until today. The problem is that potters depend in large part on intermediaries for the commercialization of their products as well as for credits to buy fuel, repair kilns or other personal circumstances.

In the towns close to Temascalcingo state programs tried to introduce gas kilns and electric mills at the end of 1960s (see Papousek 1981, 1984). At present electric mills are still in use but gas kilns have been abandoned. Delegates of FONART are today in contact with potters of Santa María Canchedá. They have proposed the use of non-lead glaze, the so-called *esmalte*. Potters have tested it but are not interested in its implementation because customers prefer the shiny finishing of lead glaze. In addition, *esmalte* is more expensive, it can be acquired only by mediation of that institution, and it requires a different control of temperature during firing, which in the period of experimentation results in the damage of many loads of vessels. The people

of FONART have also promoted the use of acrylic paintings to obtain new colors, like blue, green or red, but this is just in the starting phase and potters continue to use their common paintings. In Huasca delegates of this institution have recently encouraged the creation of a cooperative, and have offered credits to improve kilns and to buy non-lead glaze, but until now potters have not organized it and the contact with coordinators of the program has been sporadic.

In Tlayacapan this institution also tried to create cooperatives. Potters formed several groups but they did not last (Barbosa 2005.247-272). Also the use of gas kilns was promoted and several potters obtained credits to install them, but they were abandoned because they were too big for the volume of vessels produced by potters. In addition, gas was expensive. In Santa Cruz Texcoco a state program also gave credits to acquire gas kilns; however, only a few potters use them today due to the same reasons as in other towns. Gas is expensive and the control of the temperature is difficult. In San Miguel Tenextatiloyan a state program has recently offered credits to acquire electric mills and mixers and to modernize kilns. The conditions of these credits are so good that most potters now have these technical devices and more efficient kilns. Also a non-governmental organization, the CESDER (*Centro de Desarrollo Rural*), has offered pottery courses to learn new methods of forming, such as the potter's wheel, and new decorations and vessel shapes. Thus, for example, some potters are now experimenting in the manufacture of cups made with the wheel and decorated with glossy blue glaze, although their production is completely concentrated on the manufacture of lead glazed vessels made by mold. Potters are now very positive about these new opportunities to increase production and make the process of manufacture less strenuous.

In all these towns state programs have mainly promoted the creation of cooperatives and the use of technical devices to make production more efficient. The formation of groups of potters has often not functioned as it seems that this form of organization, with the format and dynamic required by FONART, is not compatible with the two axes that guide social life in pottery towns; the communal organization and the family workshops. Some technical innovations have certainly been useful to potters and have therefore been quickly incorporated into the workshops. Other technical devices have not represented an improvement and have been abandoned. In contrast to the

case of *artesanías*, these programs have not tried to distribute and commercialize potters' production as this industry has its own mechanisms. The market for common lead glazed vessels is relatively large and intermediaries have a well-developed system of distribution. The problem is that they pay very low prices to the potters, and limit the creativity and initiative of potters by imposing the kind of vessels to be produced. Very few potters commercialize their vessels themselves. Nevertheless, the system of distribution, as it is now, has permitted pottery towns to adapt to the requirements of the market, and for this reason, this industry is still flourishing. Thus, in these towns FONART has contributed to making production more efficient and less arduous, but has not altered the organization of production, the methods of forming and decoration or the inventory of vessels.

In Los Reyes Metzontla the situation is different. This town is located in a very dry area with poor soils, difficult access to urban centers and few possibilities of other means of income apart from the very limited agriculture. Nevertheless, pottery is an important activity, in the hands of women, and is distinctive because surface finishing and decoration of vessels are as in pre-Hispanic times. The main limitation of potters is, however, the commercialization of vessels. In view of this situation, state programs have encouraged the production of pottery, in particular of *artesanías*, with the aim of creating new means of income (Figure 41). That is, FONART buys large amounts of vessels for its urban shops and also gives credits to potters to buy firewood and to modernize kilns. In addition, this institution organizes annual artistic competitions to stimulate creativity. Potters are positive about the first results. Today more families make pottery, young girls want to learn this activity and for this reason, courses are organized, and, what is more important, living conditions have been a slightly improved. However potters depend entirely on the government. Almost all the production is acquired by agents of FONART, who do not have an adequate plan of commercialization, as most of the vessels are only sent to their shops. In addition, potters have not been involved in the commercialization of their products. Potters also do not have the opportunity to adapt to new requirements of the market. In that way pottery in Los Reyes is not self-sustainable.

Although programs of development for pottery as a rule follow the same strategies, they have had varied impact on pottery towns and on the traditional ceramic technology. In some towns these projects have



Figure 41. *Artesanías* manufactured in Los Reyes Metzontla.

stimulated the manufacture of *artesanías*. As a result potters have made production more efficient but at the same time they have given special attention to the preservation of ancient manufacturing methods and to artistic creativity. However, many of these potters became dependent on these programs. Living conditions have been slightly improved, and the ceramic tradition has been maintained, but the prospects for the future are not clear. In contrast, the projects of development for towns concentrated on the production of common domestic pottery have had different results. Potters have adopted technical devices to make production more efficient, though they have maintained the ancient methods of manufacture. These programs have not been involved in the commercialization of the production and for this reason, potters continue to rely on intermediaries. These intermediaries notably limit potters' economic growth and creativity. Potters' living conditions have slightly improved in the last decades but not at the same rate as those of intermediaries. However, these traders quickly react to the preferences of the market, therefore this industry is continuously adapting to at present, and in that way has a future.

Present-day ceramics in central Mexico

Today in central Mexico traditional ceramics for domestic purposes do not look as they did in ancient times. Late pre-Hispanic and early colonial decorations, like the typical Aztec black painting on orange and the polished red slip, are no longer existent. Decoration is extensively dominated by the use of lead glaze, a colonial innovation that rapidly extended in Mesoamerica after the conquest. However ornamental details in addition to glaze are now different to those in early colonial times. Instead of applications, modeling and incisions, the embellishment of the vessels is now made with simple and hastily done painted motifs. The present-day repertoire of domestic vessels has maintained several ancient shapes, such as *comales*, *ollas* and *cazuelas*, but with the exception of *comales*, these kinds of vessels manifest several morphological modifications so that they do not look as they did in the past. Despite these changes in the visible aspect of vessels, the ancient methods of manufacture have been maintained. Potters continue to make vessels in mold, and use the same pre-Hispanic molding principles. In particular this part of the production process has been preserved because ceramic-making continues to be fundamentally centered on family workshops. That is, knowledge and skills required to form vessels are learnt in the family, often during childhood, and are transmitted across generations as family legacy. The method of forming has also been conserved because it is the most adequate considering the kind of forms made and the clay recipes used.

In that way present-day traditional vessels are a continuation of the pre-Hispanic and early colonial ceramic tradition. However, the function of these ceramics has changed. Today this industry has concentrated on the production of common lead glazed wares for domestic purposes, which are sold because they are low-priced but also because they continue to be related to ancient Mesoamerican cooking and eating habits that are still present in parts of Mexican society. In those contexts ceramic vessels represent only a fraction of the containers used in the household, as they have been replaced by objects of plastic, metal, fine ceramic or glass. In particular serving vessels for individual consumption made of clay are much less frequent than in the past. The reason is that they have been substituted by other artifacts but also because they are no longer seen as symbols to represent a person's

social position. In addition, new functions for these kinds of vessels have appeared; some are now *artesanías*, as they are directed at the tourist market. Others have found new urban niches associated to typical Mexican customs, for example, serving vessels in restaurants specialized in Mexican cuisine or *piñatas* for *posadas*. All these vessels today have a relatively large market. For this reason, several towns in central Mexico are specialized in their manufacture, and this represents the main source of income for many families. As a rule intermediaries control the production in those towns. Their role is, however, controversial. On the one side they exploit the potters, limit economic growth of the workshops and restrict creativity. On the other, they offer some security to potters, as they guarantee the commercialization of their vessels and are constantly reacting to the new requirements of the market.

The pottery industry is today confronted with an important limitation. Firewood is scarce and therefore expensive. Potters have reacted in several ways. They are using other fuels, constructing bigger and more efficient kilns and segregating their production so that there are now workshops specialized in firing vessels. They have also modified their schedules and organized the production in order to economize on fuel as much as possible. Still, the access to fuel remains the main concern for potters and is shaping the future directions of ceramic-making. However it might be that this limitation is not new. In the tenth book of the *Florentine Codex*, Sahagún presents a list of different clay objects made by potters and sold by dealers. This list includes a group of vessels categorized according to their manufacturing quality, and different kinds of low-quality vessels are mentioned (Sahagún 1961, X:83). This suggests that potters were, like today, extremely careful in the use of clay and fuel, and that imperfect vessels were also offered on the market.

Fuel restriction is not the only difficulty for potters at present. Like many other traditional crafts, ceramic-making does not permit good living conditions. Potters receive very low payment for their production, thus they depend on intermediaries for credits to buy fuel and to resolve other family circumstances. Also agriculture is often poor in the region and within the towns other means of subsistence apart from pottery are difficult. In many cases all this has promoted that young people do not see prospects in this activity and prefer to migrate to work or to study. State programs of development have tried to

stimulate the manufacture of traditional pottery for this reason, for several decades. Many of these projects have failed because their strategies have not been adapted to the particular situation of the towns or their implementation has depended on political agendas. Nevertheless, in some cases these projects have had some positive impact on the social and economic situation of potters. In terms of the ceramic tradition their impact has been varied. In the case of towns dedicated to the production of common domestic wares, these projects have encouraged potters to adopt new technologies to make production more efficient. These projects have also tried to create cooperatives but with less success. However, these projects have not interfered in other levels of organization in the community, particularly not in the family workshops. In that way potters have maintained their methods of forming, styles of decoration and vessel shapes. Thus, these parts of the production process have been changing according to the preferences of the market, and not because of the institutions coordinating these programs. In contrast, in the case of towns dedicated to the manufacture of *artesanías*, the impact of development projects has been greater. In many cases potters became entirely dependent on these programs. Although traditional methods of manufacture have been maintained and creativity has been stimulated, the production has been shaped according to the requirements of these programs and not according to the preferences of the market. Thus, in some cases this industry has not been adapted to the present time.

Thus, environmental restrictions and state programs of development have shaped the actions of potters in the last decades. Despite this, they have maintained connections with the pre-Hispanic ceramic tradition. This, however, does not imply that craftspeople are static and conservative. They have adopted technical innovations when these represented an improvement. They have been open to new ideas and methods of decoration to satisfy the preferences of the market. Nevertheless, they have maintained the ancient methods of forming because they are intimately related to family life, and also because they are the most adequate to produce the vessels requested by their customers.

CHAPTER SIX

CERAMICS, CULTURAL CONTINUITY AND SOCIAL CHANGE

After the conquest the indigenous ceramic culture persisted. This did not mean that it remained static however; rather it developed and transformed in response to new circumstances. Pre-Hispanic ceramic-making in central Mexico had few changes during the early colonial period. Clay recipes, method of forming and firing technology were maintained as in earlier times. Shape, surface finishing and decoration of vessels had modifications but objects were still visually associated to the pre-Hispanic tradition (with the exception of the lead glazed wares). The most common Late Aztec ceramics continued to be made after the conquest, although we can recognize that the preferences of potters and users of the vessels began to be modified. For example, the typical Black-on-Orange wares were still produced after 1521, but they became less popular and were no longer made by the end of the early colonial period. Red Wares, in contrast, flourished after the conquest. They became the favorite indigenous-style wares in early colonial times and manifested great creativity.

After 1650 ceramic-making experienced more changes. Clay recipes, method of forming and firing technology were still as in ancient times, but morphology, finishing and decoration were so modified that vessels became gradually more differentiated from their pre-Hispanic antecedents. This trend continues until the present-day. Thus, today vessels do not look as in the pre-colonial past. In central Mexico the majority of the production is now concentrated on lead glazed wares, which are embellished with motifs not related to ancient decorations. The shapes still have resemblance to ancient forms although potters have made many innovations in minor formal details. Nevertheless, the method of forming has been maintained as in the past. In my opinion, this is intimately related to the core of this tradition, and therefore they are signs of the continuation of the pre-Hispanic ceramic culture till the present time.

The method of forming can be considered at the center of a pottery tradition because it is closely associated, and even determines, other

stages of the process of manufacture such as the clay recipes used, the method of firing, the finishing of the surface and the possible repertoire of vessel shapes. It is also related to a particular scale and schedule of production and work division. That is, it is also connected with the organization of production. This aspect is also at the center of a pottery tradition as the form in which this industry functions (family workshops, factories, cooperatives) determines the manner of knowledge transmission across generations, and therefore the dynamics of ceramic change.

When we observe the ceramic industry in a long-term perspective, that is from 1521 to the present time, we recognize that potters have been more resistant to change in those parts of the pottery process that are closer to the core of the tradition. At one extreme of this process we can locate the decoration of vessels. Artisans have been very open and flexible in this activity. For example, in the first colonial years potters learnt the lead glazing technique to decorate vessels, and it was rapidly and widely extended in central Mexico. Also indigenous-style ceramics that continued to be made after the conquest—such as the Red Wares, the Black-on-Orange wares and the polchromes—incorporated new decorative elements. Some of them were clearly influenced by the new colonial world, like the vessels' supports in the form of lion claws, the *vasijas de negritos* represented in the *Código de los Alfareros de Cuauhtitlan*, or the painted patterns on Red Wares imitating decorations in Majolica wares. However, other new decorative elements were created out of the pre-Hispanic tradition, such as the great variety of differential polishing for embellishing Red Wares. At the present-day potters continue to be open and creative in vessels' decoration. Although the ornamentation of vessels is usually hastily done and insignificant, artisans are willing to incorporate new motifs or new decorative methods when customers require it.

At the other extreme of the process of production we can locate the method for forming vessels. Artisans have been very conservative in this activity. After the conquest vessels continued to be made with molds as in the past, even after the Spaniards introduced a new method of forming in the early colonial period. The potter's wheel did permit them to make small vessels faster than with molds but this technique did not represent an advantage for native potters. At present vessels continue to be manufactured with molds, even when some potters in some towns also know how to form vessels with the wheel and are skilful in its use. The method of forming consists of a series of motor

abilities learnt and internalized by potters, often in childhood, that have been made habit, and for this reason, it is difficult to change. The method of forming is also directly related to the potters' own conceptualization about ceramic-making. For example, central Mexican potters visualize vessels as part of a sphere, composed of several horizontal parts in which the neck or rim is the last section to be manufactured. The ideas about how vessels should be made also constitute a habit, and therefore they are difficult to change. However, the permanence of the method of forming is not only due to the fact that motor habits and ideas are difficult to change.

The method of forming used by central Mexican potters is also intimately related to their clay recipes, their methods of firing, and their vessel shapes. That is, the ancient recipe in which clay is blended with sandier clay gives stability to the vessels during drying and firing. This recipe is, however, not practical when vessels are made with the wheel because the presence of large particles in the clay scrapes potter's hands and does not permit them to adequately model the vessels. The vessel shapes distinctive of the Mesoamerican tradition, such as *ollas* with round bases and globular bodies, bowls with flat bases and angular silhouettes or *comales*, can be adequately made with molds but not with the wheel. In the case of these kinds of vessels, the permanence of a particular shape is not only a matter of aesthetic but also of function. The form of these vessels is optimal for cooking directly on the hearth, which is the traditional Mesoamerican method of cooking. Also the form of *ollas* is optimal for cooking beans and maize, as their globular and close shapes maintain moisture for a longer time, and these are traditional Mesoamerican foods. Thus, the method of forming vessels has been preserved as in the pre-Hispanic past because it is intimately related to other elements of indigenous culture that have persisted.

In addition, the method of forming has been kept stable because the knowledge and experience required has been transmitted in the family across generations. According to the artisans, one who can form vessels is viewed as a potter. Members of the family who help in decorating vessels, filling the kilns or mixing the clay are not viewed as potters. In family workshops the knowledge necessary to become a potter, that is, the skills for forming vessels, is as a rule learnt from the parents or older relatives. As a form of respect to them and to the family, this knowledge is maintained and transmitted to younger generations. Also, forming vessels with molds implies a particular dynamic in the workshop. As a rule, potters cannot work alone because the

quantity of available molds, the various stages of forming and drying the vessels' sections, the space in the workshop and the number of vessels planned to be made require at least two well-coordinated persons. Thus, a drastic change in the method of forming, for example from the use of molds to the use of the wheel, may imply important changes in the organization and schedule of the workshop, and in some families this may also imply changes in other daily activities. That is, the method of forming vessels is at the heart of the ceramic tradition because it is closely connected with several essential aspects of family life, like respect to the elders, cooking habits and domestic organization.

Between decoration and method of forming we can recognize other parts of the process of manufacture that may be modified if they represent a benefit for potters and if the situation is favorable for the changes. For example, the process of clay preparation and the firing have incorporated in the last decades technical innovations to make production more efficient. Potters have acquired electric mills, made bigger kilns with better isolation and modified the fuel. This occurred because institutional programs of development have given credits and because potters realized that these technical strategies did increase their production. However, these innovations only simplified the process of manufacture, they did not change it. The sequence of manufacture and the final products have been maintained as in earlier times. Nevertheless, these innovations to make pottery less arduous have motivated younger generations to continue in this profession.

In a long-term perspective, the function of ceramics has also changed. After the conquest ceramic vessels continued being the most important containers for domestic activities. However, this kind of material was notably less used in ritual contexts. In part, this was because pottery censers were clearly identified with pre-Hispanic religious practices, and were therefore suppressed. Also the Spaniards introduced in the early colonial period containers of other materials, such as metal objects, and other forms for manifesting devotion, such as candles, that became very popular. Due to the reduction of ceramics in ritual activities the function of decoration was also modified. Vessels with pictographic decoration, in which short messages associated to the context in which they were used were depicted, were no longer made by the end of the early colonial period. Thus, the tradition of ceramics as media of literacy disappeared. Vessels continued to be decorated in the late colonial period although motifs became sim-

pler and less meaningful. At present, in the case of ceramics for domestic uses, decoration is not an important part of the production process; it is simple, hastily done and does not have special meanings for potters or consumers.

The change in the function of ceramics is particularly evident in the case of *artesanías*. Some of them are per design for utilitarian purposes but potters produce them for urban or tourist markets in which they have only decorative uses. Other objects are specially created for ornamentation, for example, the imitations and reinterpretations of polychrome archeological pieces made by a potter in Metepec. In this case the use of the vessels has been more evidently separated from pre-Hispanic functions, and also the role of decoration has been modified as the painted motifs do not convey the same meanings as in the past. In most households in Mexico today ceramics are not the most common containers, but rather only one type among a variety of objects of other materials. This is, however, not the rule. In contexts in which the Mesoamerican tradition is more present, ceramic vessels are still an important constituent of the cooking implements. Also censers are again present in religious celebrations, in particular in those in which the Catholic and the Mesoamerican rituals intertwine, such as the ceremonies for the Day of the Dead.

The development of ceramic-making during early colonial times

The *Códice de los Alfareros de Cuauhtitlan* is in my opinion a clear illustration of the situation of the native ceramic industry in the first decades after the conquest. This document was presented in 1564 by four potters of Cuauhtitlan to the local colonial authority to claim their rights. It shows that by that time potters of domestic wares in the valley of Mexico had adapted to changing circumstances. That is, they were in contact with the colonial administration, had good knowledge of the colonial legal procedure, and used it to claim their rights. The manuscript illustrates with drawings and a few pictographic conventions the vessels paid and not paid for by the *alcalde mayor*. This is done in pre-Hispanic style although the illustrations are simple and clearly understandable for those not versed in pictography. The *juez de residencia* in the town commented on this document with a short text in alphabetic writing in Spanish language that potters made this claim because “son pobres e juraron por dios e por Santa maria e a la

senal de la cruz que no lo piden de malicia syno por alcanzar justicia¹”.

This shows that potters were well aware of the importance of indicating that they were good Christians and good persons. William Hanks in his recent study of colonial Maya culture convincingly argues that the colonizing process in Yucatán was guided by the logic of *reducción*, a total project of pacification, conversion and ordering of the indigenous culture that was manifested in the transformation of space, conduct and language. He explains that a main product of *reducción* were the *indios reducidos* who acted in accordance with *policía cristiana* ‘Christian civility’ (Hanks 2010:xiv-xv). This same process seems to be reflected in the codex of Cuauhtitlan. The document gives the impression that potters clearly recognized the value of showing acceptance of the new Christian habits. The manuscript also mentions that the potters were poor, a general condition of potters of domestic wares at present, and apparently also in the colonial past, but it seems it was important to mention it, as poverty was also part of the Christian values transmitted by the first religious orders in central Mexico. The document was sent to the defendant *alcalde mayor* and the *juez de residencia* comments in his answer that he said: “lo es ny es que no le mandado nynguna jarro que no este pagado y que se ... [?] en [...] porque ello [...] piden mas de lo que mercen y en lo [...] dicho aranzel les tiene presentado y satisfecha e sy lo dixe [?] e los di ... [?]” (*Códice de los Alfareros de Cuauhtitlan*).

That is, the *alcalde mayor* negates the accusation, and insists that the potters have not paid him the corresponding taxes. This is the only written information in the document (excepting several explanatory glosses for the drawings), so we do not know how this case finished. However, very probably the potters had little chance of success as the word of colonial authorities, even local ones, had more weight, and as can be implied from the text, taxes were an important tool of control and manipulation. The fact that the *alcalde mayor* of a large *altepetl* in

¹ They are poor and swore in front of God, Saint Mary and the Holy Cross that they ask that not because of malice, but because they want to reach justice (*Códice de los Alfareros de Cuauhtitlan*, my translation).

² It was not sent to him any pot that was not paid and that ... [?] in [...] because [...] they want more than they deserve and in ... [...] such tax was presented and resolved and I told them [?] and I gave it them ... [?] (*Códice de los Alfareros de Cuauhtitlan*). This is the third block of text transcribed by Rosanna Woensdregt. Barlow (1951) only reproduced the last line of this text, but it coincides with the new transcription.

the valley of Mexico requested Red Wares confirms the wide acceptance and distribution of this kind of vessel evidenced in the archeological record. It also shows that local colonial authorities used Red Wares with typical pre-Hispanic shapes, like the *molcaxetes* illustrated in the document, as well as vessels with shapes related to the Spanish tradition such as *alcarrazas*, *tinajas* or cups.

The document also exemplifies the situation of the native ceramic tradition. The vessels represented are Red Wares that had their origins in pre-Hispanic culture. However, the shapes clearly show the interaction of indigenous and Spanish ceramic culture. A few shapes have direct pre-Hispanic antecedents such as the vessels named in the text *molcaxetes para cacao*s, though the majority show formal attributes of Spanish origin that became very popular in the early colonial period, such as ring bases and cover lids. Also some vessels show the creativity of potters who produced new vessels with ideas taken from the new colonial world, such as those objects named in the text *vasijas como negritos*, or the vessels with appendages representing Spanish faces. The vessels show a lot of innovation and intertwinement of native and Spanish ideas; however, the study of archeological remains of these kinds of wares indicates that this exchange was somewhat superficial. Ceramics incorporated new formal elements, but the method of forming vessels remained as in pre-Hispanic times.

The text or the brief alphabetic notes explaining the illustrations do not associate the vessels or the pottery of Cuauhtitlan with the indigenous world. Neither the potters nor the vessels are qualified as indigenous. Although the texts are brief and likely omitted a lot of information, the lack of association of the Red Wares of Cuauhtitlan with the indigenous society might suggest that this kind of ceramics and the potters of that town were not unambiguously identified as indigenous. That is, the colonial society in the valley of Mexico, at least in large towns such as Cuauhtitlan, was at that time no longer polarized as indigenous *vs.* Spanish people but a variety of social groups had developed in-between. In particular Red Wares might not have been seen as indigenous wares directly connected with the pre-colonial past, but rather as flourishing colonial ceramics, likely separate of the Spanish tradition, although not part of the past.

The developments of indigenous ceramics after the conquest should not be hastily labeled as decline. Although affected by the Spanish ceramic tradition, Mesoamerican potters reshaped their own notions about pottery and manipulated them as a means to attain their own

ends. Thus, they manufactured vessels according to the preferences of the new colonial society. For example, the typical Aztec Black-on-Orange wares incorporated decorative motifs that were common in all forms of colonial material culture, such as flowers, birds and patterns of leaves. They also elaborated Red Wares with typical Spanish formal attributes, like ring bases and lids, that were apparently very popular at that time. They also produced lead glazed wares as this kind of decoration became the favorite colonial innovation of this industry. However, the methods and goals of the potters were indigenous rather than Spanish. They continued producing with the same process of manufacture the whole repertoire of vessels for the indigenous quotidian life. They also produced a few vessels clearly originated in the Spanish tradition, like the candle holders, because these artifacts were widely adopted in colonial society.

Native ceramic-making in early colonial times corresponded with the general situation of indigenous culture at that time. Lockhart (1992:429) explains that in central Mexico Spanish elements pervaded every aspect of Nahuatl life, but with limitations, often as discrete additions within a relatively unchanged native framework. Indigenous ceramics show a similar process. Even typical and highly standardized Aztec wares, like the Black-on-Orange vessels, incorporated elements of the Spanish world, in particular decorative motifs. Other indigenous ceramics adopted and reinterpreted more Spanish elements in vessel shapes, morphological details and decorations. However, the indigenous framework for ceramic-making was preserved. Vessels continued to be conceptualized in the same way as in the past, and were made with the same process of manufacture and organization of production, and knowledge was transmitted using the same mechanisms as in the past.

The pre-Hispanic ceramic categorization was modified, however. The codex of Cuauhtitlan evidences that a majority of vessels received Spanish names (although it is not clear if this was only in contexts of contact with colonial authorities). In his tenth book Sahagún (1961, X:83) shows that the indigenous taxonomy of vessels was simplified in the translation to the Spanish language. For example, he offers eight different Nahuatl terms for bowls, which in the *Historia General* he concentrates in one term: *vaso* (see Table 1) (Sahagún 1992, X:571). In addition, the nomenclature for vessel dimensions changed after the conquest. At present in some pottery towns of central Mexico potters categorize the various sizes of a vessel shape according to pre-His-

panic, colonial and modern conceptions. For example, in Amozoc some sizes of *cazuelas* are named according to their price in *reales*, others according to spans of a hand, and still others are called *de a tlaco*. Although it is not clear when these terms were introduced into the nomenclature, this shows that after the conquest the ceramic categorization began to be modified, and in that process it incorporated and mixed various systems.

The development of ceramic-making at present

The pre-Hispanic ceramic tradition has persisted until the present time. Today it is known as 'traditional' or 'typical' pottery. In central Mexico towns specialized in the manufacture of this kind of ceramics are often associated with the contemporary indigenous culture, or have direct indigenous antecedents, although this is not the rule. Still, we can categorize this form of material culture as 'indigenous-style' because it has preserved the central elements of the pre-Hispanic ceramic culture, and is related to other aspects of the indigenous world such as food habits and the close link between family, means of subsistence and place of production. Although in the last four decades pottery towns in central Mexico have been involved in the enormous social and economic changes in Mexican society, potters continue to use the same process of manufacture as in the past, and the family workshop continues to be the unit of production. The situation of the pottery towns in this region is particularly interesting. Most of them are close to large metropolises and have incorporated many elements of urban culture. They are also placed next to important communication routes and intermediaries have greatly increased the scale of distribution of their products. Due to their central location, the ceramic industry of several of these towns has received an important boost in the last decades. Although urban culture is widely extended in central Mexico, indigenous domestic habits are still preserved in some rural and urban contexts. Thus, cooking implements such as *comales*, *ollas* and *cazuelas* are still requested. Also 'traditional' ceramics are in demand in urban contexts for serving Mexican food or for ornamentation.

In these pottery towns many young people now go to work or to study in the cities or migrate to the United States. Despite the intense contact with other cultural frameworks, pottery has conserved the

core elements of the pre-Hispanic ceramic culture. In my opinion, the main reason for this is that the family workshop continues to be the unit of production. The family structure, even when some members go to work or study in other places, has promoted that the organization and schedule of production has been maintained as in the past, and that the transmission of knowledge has not been interrupted. In those pottery towns ceramic-making is very conservative in the method of forming but innovative in decoration and morphology. Potters are quite open to new decorations and shapes if customers require them. These two different forces result, on the one side, from the fact that this industry is still embedded in the family and is a strong source of cultural stability, and on the other, from the fact that young potters have to adapt to the current needs of the market if they want to earn a living with this craft. In these towns intermediaries are often important motors of innovations, as they are aware of the preferences of customers and new trends outside of the town. However, they often exploit the potters. They pay them very low prices for their products so that potters have to ask them for credits to continue with the production, and are not able to create the capital to improve their facilities or resolve other problems of life. This has also had negative consequences for the ceramic tradition, as potters have to save as much as possible in the production, and therefore they often produce simple or rough vessels without decoration or use plastic trash as fuel.

For several decades institutional programs of development have tried to improve the social and economic situation of Mexican potters. They have promoted the creation of cooperatives in order to restrict the influence of intermediaries and stimulate potters to commercialize their products. They have given credits to acquire electric mills or better kilns, and they have offered courses in which new techniques of manufacture and methods of decoration are taught. Although the main lines of action would be adequate to solve the central problems of potters, many of these programs have failed because they have responded to political agendas and have therefore lacked continuity. Also the projects have not been adapted to the particular situation of the pottery towns. For example, the regulations of cooperatives have often not been in accordance with the social organization of a town, or the gas kilns offered have not corresponded to the volume of production and the size of the workshops. Regardless of this, in the last forty years programs of development have been important sources of change. In some pottery towns today, as is the case of San Miguel

Tenextatiloyan, all potters use electric mills, electric mixers and efficient kilns. Also some potters are experimenting with new vessel shapes and forms of decoration learnt on the capacitating courses. Potters are also organized into cooperatives. Until now all these innovations have contributed to make production more efficient and less arduous and have improved slightly the social and economic situation of potters. Nevertheless, the process of manufacture, and in particular the method of forming, still conserves many aspects of the ancient ceramic tradition.

Ceramics and cultural continuity

Knowledge and experience associated with indigenous ceramic-making continued to be transmitted after the conquest. The family workshop was not only the place where this traditional craft was done, but also the mechanism for conveying the understanding of pottery across generations. Lockhart (1992) has convincingly shown that during the early colonial period there were few changes in the organization of the indigenous communities of central Mexico. The persistence of the communal framework in the first post-conquest century certainly promoted the maintenance of the family workshop. Although colonial documentary sources provide scant information about this form of industry, the present-day predominance of family workshops in the manufacture of traditional crafts suggests that it has been the central unit of production since pre-Hispanic times.

Today the pottery workshop in general involves two family generations. This is also the rule in the pottery towns of central Mexico which intensively produce lead glazed vessels. This guarantees that knowledge is transmitted in the family without interruption. Usually all members of the family—elders, young people, children—are involved, although many of them only in an informal way. Habitually potters instruct some of their children or nephews in the method of forming vessels more in depth. These are the children who do not go to work outside the town or do not study and therefore remain helping in the workshop. Young potters learn the required motor skills and experience by frequent repetition, so that these are soon internalized and become habits. Thus, this knowledge is implicitly transmitted by means of body performance across generations in the context of the family. The knowledge required to make vessels in a particular way

continues to be transmitted because this is the method that potters learnt from their parents, but also because the particular kind of vessels made with this method are still preferred by potters and requested by customers.

Ceramic-making is only one example of the great variety of knowledge that was transmitted by body performance, in an implicit way, across generations in the pre-Hispanic past. A large part of ancient knowledge was composed of this kind of understanding, for example, agricultural practices, food habits, hunting and fishing or the manufacture of other crafts. In the same way as the ceramic technology, these aspects of life were embodied in actions and transmitted in the family without them being clearly aware of it. Their persistence over a long span of time gave cultural continuity to Mesoamerica. This kind of information complemented the knowledge conveyed by means of explicit mechanisms of memory, like books, monuments and ritual practices. They commemorated past events and in that way ancient knowledge and experience was deliberately transmitted across time and made part of the present time. In the words of Assmann and Czaplicka (1995:130-132), these media maintained the knowledge from which the Mesoamerican culture constructed its living identity.

However, after the conquest these declarative media of remembering were suppressed. It is widely documented that Christian monks burned native books and prohibited public ceremonies of the ancient religion. Parts of the knowledge linked to these media, however, did not disappear; they became confined to oral literature and merged with new understandings and experiences. In my opinion, media of implicit memory acquired a new importance. That is, mechanical, repetitive and ritualized activities became the main media to transmit knowledge. It is possible that these activities, and their material manifestations, served to recall the pre-Hispanic past, and in that way helped to construct the self-image of the indigenous society after the conquest. This might be the case of agricultural practices and of native crafts, such as ceramic-making. The mechanism for transmitting knowledge was the performance of sequences of actions, very internalized, in the context of the family.

In the case of pottery, the early introduction of the Spanish ceramic tradition to Mexico City, which used other methods of manufacture and firing, vessel shapes and decoration might provoke that at the beginning native ceramic-making was seen as distinctive of the indigenous culture, clearly contrasting to the Spanish tradition. At that

time it was recognized that a basic difference between the two traditions was the method of forming. This can be observed in one of the few documentary references to indigenous ceramic-making in the early colonial period. An early manuscript mentioned before in this book, the document sent by Viceroy Lorenzo Suárez de Peralta in 1583 to the *alcalde mayor* of Michoacán shows that colonial authorities recognized ceramics made with molds as distinctive of the indigenous world, and by the way, they characterized them as deficient and fraudulent. In the text the viceroy makes a distinction between *olleros* and *oficiales para hacer platos y escudillas*. It seems that the first made indigenous-style vessels while the latter made Spanish-style vessels. This division seems also related to the techniques used, so what he calls *platos mal hechos con fraude y engaño* were likely vessels made with the indigenous methods of forming, that is, with molds. Thus, it seems that the method of forming—the use of molds or wheel—became emblematic of both ceramic traditions. These two methods of forming were associated with different ceramic complexes as manufacturing marks on archeological ceramic remains suggest. Vessels made by mold had shapes, surface finishing and decoration originated in the pre-Hispanic ceramic tradition. In the same way, vessels made by wheel had shapes, surface finishing and decoration associated with the Spanish ceramic tradition. Lead glazed wares clearly exemplify this separation. Glazed wares made with molds had shapes that were part of the Mesoamerican repertoire while glazed wares made by wheel had Spanish-style shapes. The separation of these two ceramic complexes on the basis of their forming method may imply that the two groups of vessels were made in different workshops.

The 1583 document of the viceroy Suárez de Peralta suggests that by that time there were institutional efforts to separate the two ceramic traditions. He wrote that there were *oficiales* in this industry and they made *platos* and *escudillas*, while at the same time there were *indios olleros que no son ni han sido ni pueden ser oficiales de dicho oficio ni lo saben hacer dichos platos mal hechos y de donde se sigue fraude y engaño*. This implies that there was a kind of guild or organization for potters who made pottery in the correct manner (with the wheel), which instructed potters outside the family and conferred authorization to practice this activity. Such institution, apparently antecedent of the pottery guild officially founded in Puebla in 1653, separated even more the indigenous-style ceramic tradition from the Spanish-style ceramic tradition. Not only were the products different but also

the form of knowledge transmission varied. That is, it seems that the first one was centered on family workshops while the second was centered on non-family workshops with apprentices, officials and masters. Although non-family workshops had rules dictated by the guild statutes, the broadcasting of information to younger generations was less personalized and not attached to core values of the society, such as respect to the elders, and therefore the dynamics of change were different.

It is possible that after the early colonial period vessels made by mold were no longer associated with the indigenous pre-Hispanic culture. Vessels made by mold and vessels made by wheel still constituted two separate complexes with different methods of firing, shapes, finishing and decorations. However, potters specialized in vessels made by mold incorporated a growing number of new shapes and decorations so that the visual connections of these objects with the pre-conquest past were reduced. At present pottery made by mold is still separated from pottery made by wheel. The first group is considered 'traditional' or 'typical' pottery, and in that way it is still connected by some potters and consumers with ancient ceramic traditions. However, this industry is today not a commemorative element of indigenous culture. It does not deliberately mark ideas to be remembered. Rather, it is part of the ancient knowledge and experiences that have been implicitly transmitted in the family till the present time. It is one of the elements that have made possible the continuity of Meso-american culture in the twenty-first century.

The role of material culture in the process of colonization

Material culture clearly reflects actions of people and social processes. For example, indigenous potters after the conquest continued working as in the past, with the same conceptualization about their craft, but they were impressed by the new visual culture introduced by the colonizers. This had echoes in their ceramics, and for this reason, we find in early colonial contexts vessels made in the Late Aztec style with new decorative motifs such as leaves, flowers and birds, and new supports in the form of pig hoofs and lion claws. However, material culture is not only a reflection of social actions but also provokes social actions. That is, it also has agency. In the first years after the conquest indigenous-style ceramics represented the pre-Hispanic world and for

this reason they related their makers and users with the indigenous culture and accordingly created particular social relations. In the same way, Spanish-style ceramics represented the Spanish world, or the group of social ideas that Kathleen Deagan (2001:186) in the Caribbean colonial context has called *hispanidad*, and for this reason, they related their makers and users with the Spanish culture. In an early account from 1529 sent by Alonso Figueroa to Charles V. it is stated that Spanish wares were necessary to maintain the Spanish way of life.

However, several decades after the conquest it seems that the bipolar association between Spanish ceramics and the Spanish world and between indigenous ceramics and the indigenous world was no longer existent, and for this reason, the actions that ceramics provoked were ambiguous. The several indigenous-style ceramics of the early colonial period were connected in different ways to the ancient ceramic tradition. For example, the Black-on-Orange wares were made as in the past and look as in the past, and therefore we can suppose that people connected them to the pre-Hispanic past. Red Wares, in contrast, had their origins in pre-Hispanic times and maintained the ancient methods of manufacture. However, they incorporated several morphological details and decorations of the Spanish culture as well as new elements not present before in both the indigenous and Spanish ceramics. Thus, they likely provoked ambiguous responses. Probably, according to the context, these red vessels could bring to mind the pre-Hispanic past and associate their users with the indigenous culture, or they could just evoke the colonial present. Thus, they were probably not related to the indigenous and pre-colonial past as we today suppose. The codex of Cuauhtitlan and other scattered documentary references did not relate them to the indigenous society. Juan Suárez de Peralta even mentions that they were used by new colonial nobility (1990 [1589]:185). For example, he says that they were used as serving ware in a dinner organized by Alonso de Avila of Cuauhtitlan for the wife of the Marqués del Valle.

Very probably Red Wares continued and flourished in early colonial years because they promoted a variety of social responses, and for this reason, were appropriate for a variety of contexts. Lead glazed wares were even more ambiguous. Some vessels had Spanish-style shapes and were imported from Seville, others had Spanish-style shapes but were made in Mexico City in Spanish-style workshops, others had Spanish-style shapes but were made in indigenous-style workshops with pre-Hispanic manufacturing methods, and others

had indigenous-style shapes and were made in indigenous-style workshops. Thus, they likely motivated in their users different associations, and also different social relations. All this shows that early colonial ceramics cannot be simply divided into two groups, indigenous *vs.* Spanish, as we do today. Thus, early colonial ceramics reflected the existent social relations and at the same time created them, but these relations were more varied and complex than the simple opposition between indigenous (colonized) and Spaniards (colonizers).

In my opinion quotidian material culture, like domestic ceramics, did not play an important role in the process of colonization. Probably only in the first years after the conquest ceramics categorized people and provoked particular social relations. It might be for this reason that Aztec Black-on-Orange wares and the polychrome vessels disappeared and Majolica wares extended in urban contexts. However, after some years potters and vessel users adapted to the new circumstances, and therefore there were produced ceramics in accordance to the new colonial reality. It seems that access to the variety of ceramics available on the market was not determined by the social situation of the consumers but by their economic position. For this reason, we find Red Wares in affluent houses of *La Traza* in Mexico City, as well as in domestic areas of the indigenous city of Cholula, or we frequently find Majolica wares in contexts associated with colonial authorities in the city but also a few examples in rural and indigenous locations, like the countryside of Otumba.

Reactions of Mesoamerican potters to the colonization

Indigenous potters reacted to the new post-conquest circumstances. They continued producing vessels for the indigenous market, with the same shapes as before. They decorated these objects in the same way as in the past but also incorporated new motifs inspired by the colonial world. They also began to make vessels with new formal elements and to create new vessel shapes to meet the colonial needs. For example, they made candle holders or Red Wares with shapes of Spanish origin, such as plates, cups or tee canes. They also adopted the lead glaze technique because it was an appealing novelty and became very popular. That is, they adopted and reinterpreted several visual elements of Spanish ceramic culture, and developed new elements out of

their pre-Hispanic tradition. However, all these innovations were done at the surface of their ceramic tradition. Potters wanted to supply the new market but there was no reason to modify the organization and process of production, because the colonial regime did not interfere with the framework of this industry.

We cannot qualify the reactions of the colonial potters as subversive. Ceramic remains and the scarce documentary references do not suggest that potters used their pots to actively oppose the new colonial regime, either in an explicit or an implicit manner. This form of material culture was not at the center of the project of colonization, and for this reason, in my opinion, it was not openly involved in the cultural struggle of that time. Without diminishing the dramatic impact of the conquest, we observe that the main distinctive of the potters of the early colonial period is that they were adapting their craft to the new situation. They adopted several elements of the Spanish ceramic tradition, and rejected others, but we cannot assume that this cultural transfer was politically or ideologically charged as we might believe today.

The fact that this work has concentrated on indigenous-style ceramics may give the impression that indigenous potters did not manufacture Spanish-style ceramics, like Majolica wares. Flora Kaplan (1994:7) mentions that a document from the cathedral archives of Puebla states that in 1681 an indigenous potter, an *oficial de lo blanco* (a skilled potter of white ware, that is Majolica), was married. However, in the 1653 potters' guild regulations of Puebla it is mentioned that: ... *que no se pueda admitir examen de dicho oficio, a ningún negro, ni mulato, ni otra persona de color turbado, por lo que importa que lo sean de toda satisfacción y confianza ...* (*Ordenanzas de Loceros de Puebla*, in Novelo 2007:100). We do not know how extended the presence of indigenous potters in Spanish-style workshops was, or if the situation during the late colonial period was different to early times. However, ceramic remains from that time suggest that potters were not avoiding the Spanish ceramic tradition. Red Wares incorporated forms of Spanish origin, *molcajetes* were glazed and Black-on-Orange wares included supports in the form of lion claws. However, it seems that they did not perceive the Spanish ceramic technology as more advanced. Indigenous potters maintained their process of manufacture although they were certainly aware of the methods used by Spanish-style potters. Lead glazing, for example, was imitated very early.

During the process of colonization potters continued to transmit the ancient ceramic knowledge to younger generations. In that way they actively contributed to the preservation of Mesoamerican culture. Today the social and material effects of the Spanish colonization are still present in many aspects of life in central Mexico. In the case of ceramic-making, some colonial elements are still well recognizable, for example, decoration with lead glaze is widely extended. However potters and users of the vessels do not see it as Spanish or colonial attribute, but rather as a typical characteristic of the contemporary traditional pottery.

The prospects for ceramic-making

The Mesoamerican ceramic culture has a future. The pottery towns of central Mexico specialized in lead glazed wares for domestic uses are now flourishing, and we do not see signs that this will change in the near future. The market for this kind of ceramics is alive. Although the production of some artifacts for Mesoamerican cooking practices, like *comales*, has been reduced in the last decades, the production of other objects, like *cazuelas* or *arroceras*, has increased. Potters now make more vessels for the urban market, like *ollas* for *piñatas* or flower pots. Thanks to new roads and highways, the pottery towns are accessible, and the products can be distributed to many regions in the country. Potters, or their intermediaries, are aware of the preferences of the market and the new developments and react to them. And what is more important, knowledge continues to be transmitted to younger generations. Potters are now implementing technical innovations to make this industry more efficient and less arduous. Programs of development have had an important role here. Although these projects have often failed, we have to recognize that their lines of action have been directed to improve the situation of potters and at the same time to conserve the core elements of the traditional pottery. For this reason, they have insisted on the creation of cooperatives to avoid intermediaries, but have not interfered with the organization of the family workshop or with the process of manufacture. In the past some programs tried to introduce the wheel, but this was not successful and is no longer promoted. Even with these technical innovations, potters have preserved their method of forming. The production continues to be organized in family workshops. For this reason, we can prognosti-

cate that knowledge will be conveyed to new generations, and the process of cultural continuity will be maintained, at least in the near future.

The production of *artesanías* has also opened new possibilities for potters. In this field there is much more diversity than in the manufacture of domestic wares. Some potters have specialized in vessels for domestic purposes that are used as decoration in urban contexts. Others are making vessels or figures in new styles considered by urban consumers as 'traditional' and still others are reproducing archeological objects. All these objects manifest the creativity of potters and are constantly changing; nevertheless, they are made according to ancient methods of manufacture in family workshops. The production of *artesanías* is in general terms more profitable for potters although commercialization is more difficult, as there are fewer channels or they depend on state programs of development.

Although ceramic-making has prospects in central Mexico, this unfortunately does not mean that the social and economic situation of potters will be better. Many of the young potters, especially in the towns located on the periphery of big cities, are those who do not want to study or do not have another work alternative. Intermediaries are still widely present, and are still contributing to increase the poverty of many potters. Also some institutional projects have made potters dependant on their help. Limited access to fuel has become the main concern of this industry. In addition, there are several towns in which ceramic-making has been interrupted, and now only older potters sporadically make vessels. In large part, the reason for this is that these places are not located close to important communication roads, and young people, for several reasons, do not continue with this profession. Nevertheless, none of this has discouraged most potters from continuing to look to the future with positive eyes.

This is not a characteristic exclusive of the pottery craft. Mexico is a young nation; a large part of the population is still under twenty-five years old. The colonial past and the recurrent crisis of the last half century have provoked people to continuously expect better times. In addition, the enormous social and economic transformations of the last decades have made people used to changes, and to see in changes opportunities. Most potters, like the majority of Mexicans, are conscious that they have to react to changing circumstances. For this reason, Mesoamerican ceramic-making has a future.

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