

# **Tarascan Pottery Production in Michoacán, Mexico**

An Ethnoarchaeological Perspective

**Eduardo Williams**

ARCHAEOPRESS ARCHAEOLOGY

ARCHAEOPRESS PUBLISHING LTD

Summertown Pavilion

18-24 Middle Way

Oxford OX2 7LG

[www.archaeopress.com](http://www.archaeopress.com)

ISBN 978 1 78491 673 2

ISBN 978 1 78491 674 9 (e-Pdf)

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Cover: Painting pots in the kitchen (Fidel Lorenzo household, Huáncito 2014)

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*Dedicated to my son Teddy,  
to the memory of my friend Phil C. Weigand,  
and to the potters of Huáncito, Michoacán*

The potter is wiry, active, energetic. The good potter [is] a skilled man with clay, a judge of clay – thoughtful, deliberating; a fabricator, a knowing man, an artist. He is skilled with his hands...

Fray Bernardino de Sahagún,  
*Florentine Codex.*

Then the Lord God formed man of dust from the ground, and breathed into his nostrils the breath of life, and man became a living thing...

*Genesis 2:7*

Material culture has meaning only in relation to society...

Grahame Clark,  
*Archaeology and Society*



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## Preface

This book is based on over 26 years of ethnoarchaeological work in Michoacán. I first arrived in the Tarascan or Purépecha community of Huáncito in the summer of 1990 with the intention of initiating a research project that would enable me to understand all aspects of an indigenous pottery-making tradition from an anthropological and archaeological perspective. In those years, ethnoarchaeology was still a relatively unknown discipline in Western Mexico, so I was more or less alone in my chosen field. As luck would have it, when I joined the faculty of the Center for Anthropological Research of the Colegio de Michoacán (Zamora), also in 1990, Dr. Phil Weigand was there to offer me advice and support, and he became my interlocutor and friend for the next couple of decades, until his death in 2011. Phil had ample experience in ceramic ethnoarchaeology, in fact he was one of the first scholars to define this analytical approach in Western Mexico, if not Mesoamerica (Weigand 1969). From the very beginning his help and inspiration were invaluable, as were his friendship and support of my work at the Colegio.

In addition to ceramic manufacture, in this book I also touch upon other academic interests I have pursued as an archaeologist in Michoacán. In 1996, I undertook a research project on salt-making at Lake Cuitzeo, Michoacán, which resulted in the award-winning book *La sal de la tierra* (2003), published in English as *The Salt of the Earth* (Williams 2015a). After working with saltmakers in the Lake Cuitzeo Basin and on the coast of Michoacán for some six years, I broadened my academic interests to encompass the aquatic lifeway in the Lake Cuitzeo and Lake Pátzcuaro basins, adopting an ethnoarchaeological and ethnohistorical approach.

While working with saltmakers, fishers, basket-makers, reed-mat weavers and other craftspeople during all those years, I never lost touch with the potters in Huáncito. I paid occasional visits to that town, and periodically took my students to Huáncito for ethnoarchaeological field practice as part of the course I teach in the Colegio. This gave me an opportunity to document the dramatic cultural changes experienced by this Tarascan town in the last two decades. At the same time, I was able to see how a resilient pottery-making tradition evolved and adapted to new cultural and economic conditions. In 2012, I returned full-time to my ethnoarchaeological research in Huáncito, with the same three families of potters I had met many years before. This book is the result of all these research experiences.

My academic and personal life has been enriched by meeting several outstanding scholars during these years. First and foremost, I would mention Dr. Dan Healan, who was my host during the two sabbatical periods I spent at Tulane University, in 1998-1999 and 2011-2012. Dan, his wife Nancy, and my friends Ruth and George Bilbe, all gave me a good dose of southern hospitality, as well as a 'home away from home.' I should also mention Dr. Jeffrey Parsons, whom I met during my first stay at Tulane, and who has been a model and inspiration for my work ever since. Last but not least, Dr. Helen Pollard has been an indispensable friend and colleague for many years, and deserves my deepest gratitude for always sharing with me her knowledge about ancient Michoacán.

Many books and articles edited by Phil Weigand and myself, and published by the Colegio over the course of the last two and a half decades, are a testament to our shared interest in anthropological archaeology and our commitment to publishing original research that did not follow the 'normative' approach to archaeology that is so prevalent in Western Mexico. Many of these works, originally published in Spanish by the Colegio de Michoacán and long out of print, have been used in shaping the present volume. This includes my own articles, book chapters and papers, as well as works by many colleagues, students and other scholars from Mexico and abroad. I thank all of them for their contributions, especially Dean Arnold, Philip Arnold, Thomas Charlton, Patricia Fournier, David Haskell, Dan Healan, Amy Hirshman, Susan Lewenstein, Patricia Moctezuma, Jeffrey R. Parsons, Mary H. Parsons, Helen Pollard, Louise Senior, Christopher Stawski, and Phil C. Weigand. The list of publications is too long to cite here, so I ask the reader to refer to the References Cited section at the end of this volume.

The holistic approach I have followed in my research was summed up by Phil Weigand in the following words: 'Anthropological archaeology is nothing more than a series of techniques and methodologies within... the historical sciences... The relationship between history and archaeology is... close... Archaeology... is nothing... but a component of both anthropological and historical research... Archaeology of this kind is one of the most inclusive disciplines... in the social sciences and humanities...' (Weigand 2002:25-26). Weigand also said that 'My professional goal was to be an anthropologist –not an archaeologist, or an ethnologist, or an ethnohistorian– but all three things at the same time...' (1992:9). I dedicate this book to the memory of Phil C. Weigand—scholar, colleague and friend.



## Acknowledgements

First and foremost, I would like to thank the potters of Huáncito, who have always been gracious hosts and have patiently answered all my questions about their craft and many other aspects of their life. The names of the main informants are: Isaac Cayetano Lorenzo, Amalia Félix Marcelino, Pablo Felipe Lorenzo, Socorro Espicio, Elena Felipe Félix, Gilberto Espicio Ambrosio, Bernaldina Rivera Baltasar, Alfredo Felipe Félix, Fidel Lorenzo Santiago, Lafira Bartolo Santos, María de Jesús Lorenzo (aka La Chaparrita), and Marina Lorenzo.

The potter Elvia Silva Bartolo of Zipiajo was kind enough to share with me her knowledge about the craft of pottery manufacture. I thank her and all the other potters in Zipiajo for their good disposition and generosity.

When I began working in Huáncito I had just returned from finishing my doctoral studies in London. The trip back home and the start of my research were made possible by a grant from the British Academy. In subsequent years, my work has been supported by grants for fieldwork and for library research in several universities in Mexico and abroad. The funding agencies and dates are as follows: British Academy (1990); Wenner-Gren Foundation for Anthropological Research, Inc. (1991); Wenner-Gren Foundation for Anthropological Research, Inc. (International Collaboration Grant, with Dr. Michael J. Shott, Northern Iowa University) (1998); Universidad Michoacana de San Nicolás de Hidalgo, Centro Histórico del Ex-Convento de Tiripetío (1998); Fulbright and Consejo Nacional de Ciencia y Tecnología [Conacyt] Fellowships for library research at the Middle American Research Institute, Tulane University, New Orleans (1998-1999); Wenner-Gren Foundation for Anthropological Research (2000); Universidad de Colima (2000); Foundation for the Advancement of Mesoamerican Studies, Inc. (2003); Centro de Investigaciones en Ecosistemas (UNAM) (2007); Conacyt grant for library research at Tulane University's Department of Anthropology (2011-2012).

Thanks are due to Jeffrey Parsons, Helen Pollard, and Michael Shott, who provided valuable comments and suggestions on the original manuscript. However, I am solely responsible for the ideas expressed herein. Last but not least, I thank my colleagues at the Centro de Estudios Arqueológicos, especially Magdalena García Sánchez, Rodrigo Esparza and Blanca Maldonado.

Eduardo Williams  
Jacona, Michoacán,  
28 November 2016.





# Chapter I

## Introduction

Pottery is one of humankind's most important inventions. It is thousands of years old, and it is fair to say that without pottery the development of civilization as we know it would not have been possible. Food preparation and storage, religion and ritual, wine-making, trade, art, and architecture, among many other human achievements, were all aided by pottery, an artificial material that lent itself to the elaboration of all kinds of objects: vessels, figurines, roof tiles, water pipes, fishnet weights, and inscribed tablets with the earliest forms of writing, among many others, an endless litany of human creativity. In recent years, high-tech ceramics have been used in myriad applications, all of them indispensable for communication, computers, medicine, art, and many more uses than we could list here.

This book is about a contemporary pottery tradition in Mesoamerica, but it also looks back to the earliest examples of cultural development in this area. By means of ethnographic analogy, this study seeks to shed light on a modern indigenous community and on the theory, method and practice of ethnoarchaeology, undoubtedly one of the most important aspects of archaeological research in Mexico today.

In this chapter I present an overview of pottery production in Mesoamerica and related areas, accompanied by a detailed discussion of ethnoarchaeology and ceramic ecology. The reader will also find a short discussion of the history of ceramic studies in Mesoamerica and other regions, and a profile of household production in Mesoamerica, provided to contextualize the information on pottery production in Western Mexico found in later chapters. But first I will outline the contents and structure of this book.

Chapter I presents an introduction to the present study that discusses key concepts of the research, such as ethnoarchaeology and ceramic ecology. In a historical background to ceramic research in Mesoamerica, the role of pottery studies in the development of the discipline is explained in several areas of the world, including Egypt, Mesoamerica, and the Andes. Since the present ethnoarchaeological research is geared towards interpreting the cultural processes related to pottery production, and this activity took place primarily in domestic contexts, the household production of goods is also discussed in the introduction.

Chapter II is entitled 'Ethnoarchaeology: archaeology as anthropology'. This is an introduction to

ethnoarchaeological theory and practice, and to the goals of processual archaeology in Mesoamerica. It explores the relationship that archaeology and general anthropology have shared through time, and the role of ethnoarchaeology as a bridge that may serve to foster and encourage contact between these two disciplines in the context of a strained relationship and lack of mutual understanding and dialogue between them that we have witnessed in recent decades.

In Chapter III, the reader will find the main subject of this study: ceramic ethnoarchaeology and ceramic ecology in Western Mexico. The chapter begins with a discussion of my research on ceramic ecology conducted in 1990 in Teponahuasco, a peasant village in Jalisco, where I found that the alternation of the dry and rainy seasons presents a very real challenge to potters, since they find it difficult to ply their trade during the wet part of the year. On the other hand, because this is a primarily agricultural community, farming is pursued as a full-time occupation in the rainy season. By scheduling both activities during appropriate periods of this annual cycle, the potters here –as in many other areas throughout Mexico and Central America– have found an effective approach to exploiting their environment.

In the next section of Chapter III, I address the ethnoarchaeological work I have been conducting in Huáncito, a Tarascan or Purépecha village in northwestern Michoacán, on-and-off for the last 26 years. I begin with a discussion of Huáncito's geographic and cultural background, followed by a presentation of the results of my fieldwork there. The reason I went to Huáncito in the first place was to conduct ethnographic observations of all activities related to pottery-making, and to assess the role of this information in the formulation of ethnographic analogies that would help us understand the archaeological record elsewhere in Western Mexico and Mesoamerica. This research was also framed within the concept of ceramic ecology, with an interest in several aspects of human interaction with the natural environment, such as: (1) the potters' adaptation to local weather patterns; (2) the acquisition of raw materials (clay, temper, pigments); and, (3) the use of firewood in the kilns –still a prevalent practice in the region– and for cooking. The chapter continues with a discussion of how domestic space is used in several households in Huáncito, where potting workshops share space with living quarters and cooking, storage, and other areas of people's homes. The archaeological implications of these observations

are of great importance for developing a middle-range theory that links the material culture and activities of the present (the systemic context) with interpretations of the past (the archaeological context).

Chapter IV deals with Tarascan pottery as a strategic resource in the Protohistoric period (ca. AD 1450-1530). First, I discuss pottery production, trade and use in the Tarascan area, including the manufacture and exchange of ceramic products in the Lake Pátzcuaro Basin, the seat of power of the Tarascan Empire. The strategic role of pottery in subsistence activities is also addressed in this chapter, as I discuss at length the role of ceramic containers and other items in the following activities: salt-making; pulque production; the elaboration of *tesgüino* (maize beer) and other alcoholic beverages; *ixtle*- and cotton-fiber spinning; and fishing. All these strategic activities depended on ceramic artifacts for their existence, as shown here through many ethnographic, archaeological, ethnohistorical, and other examples from Mesoamerica and beyond.

The conclusions appear in Chapter V, where I summarize the main aspects of the study, its implications for the field of archaeology and general anthropology, as well as the achievements, challenges and tasks that remain for us to attend in the future.

### Overview of Pottery Production in Mesoamerica and Other Areas

Pottery is one of the elements of material culture most favored by archaeologists because it is abundant and durable, and because of the way in which each culture gave a particular shape and decoration to objects made of clay, thus distinguishing them from those produced by other peoples in other regions and times. However, in order to interpret the archaeological record related to the human behaviors that produced and consumed the pottery we find, it is necessary to observe current pottery production and use. Compared to archaeologists, however, cultural anthropologists have generally shown scant interest in pottery artifacts and the activities and cultural traits surrounding them; like most other craft activities, pottery-making has been largely neglected by anthropologists, or deemed an activity of little relevance or importance (Arnold 1985:2).

This lack of interest in material culture is widespread among contemporary ethnographers and social anthropologists in Mesoamerica.<sup>1</sup> But archaeology is

increasingly nurtured by ethnology, though the two disciplines seem to have lost a once-shared interest and mutually-understandable language. Hence, it is urgent to look for new common ground and a new dialogue between these two anthropological disciplines. In this regard, ethnoarchaeology has gained new meaning and serves as an unparalleled interdisciplinary bridge (Williams 2005; see also Sugiura et al. 1998; Kramer 1985; David and Kramer 2001).

After examining the voluminous ethnographic literature describing pottery manufacture in Mesoamerica and other regions throughout the world, George Foster (1965:43) wrote that one is struck by the lack of attention given to the social, cultural and economic contexts in which such work was carried out.<sup>2</sup> Indeed, it is true that most extant descriptions refer only to manufacturing techniques and procedures, or to design elements. In general, beyond reporting whether pots are made by men or women, most recent studies reveal little about such matters as the potter's status in his or her community, the way in which potters see their own work from an artistic and economic viewpoint, the standards of the profession, or ranges of variability in a given community.

The development of ethnoarchaeology thus came about as a direct response to the lack of interest in material culture among sociocultural anthropologists. Ethnoarchaeological research carried out among potters over the last 50 years or so has covered a wide range of topics, including technology, taxonomy, vessel function, as well as the longevity, recycling and discard of pots. Other topics examined are the division of labor, the process of learning techniques, styles, ethnicity, distribution (of wares and styles), and technological and stylistic changes (Kramer 1985:78). It might be said that archaeologists have been forced to become ethnologists –in the old sense of the word– in order to retain a direct link to anthropology in general, and sociocultural anthropology in particular. This has not been a negative experience for archaeologists; indeed, quite the opposite is true: it has reinvigorated links with our ‘mother discipline.’

Objects made of clay were the first ‘synthetic’ materials created by humans, a sort of ‘artificial stone.’ For their manufacture, early artisans combined the four basic elements of nature identified by the ancient Greeks: earth, wind, fire, and water (Rice 1987:3). The importance of pottery and ceramics in world culture since earliest times is evidenced by its role in one of the best-known creation myths. According to the *Book*

<sup>1</sup> This is characteristic of most recent studies, but not of ethnological works written in the early 20<sup>th</sup> century and before; for example, Boas (1948), Lowie (1912), and Kroeber (1948), among many others. This change in perspective came with the dominance of social anthropology over the ethnographic tradition, though the earlier authors (the best ones, in my view) had already adopted a material-

culture perspective (e.g. Evans-Pritchard 1937).

<sup>2</sup> Foster does not mention the old European ethnographic school, which exhibited a broad, rigorous, and detailed interest in material culture that they linked (with limitations) to social organization and other aspects of culture.

of *Genesis*, when God created humankind he used ‘dust from the ground’ (i.e. earth, the main component of pottery) and ‘breathed into his nostrils the breath of life, and man became a living thing...’ (*Genesis* 2:7). The word ‘ceramics’ is derived from the Greek *keramos*, which could be translated as ‘burnt thing’ or ‘clay ware’; though this pertains more to the fired product than the raw material... clay. Ceramics can be defined as ‘the art and science of making and using solid articles that have as essential component non-metallic inorganic materials’ (Rice 1987:3-4). The other term used in this study –pottery– is defined as ‘articles made of fired clay; the craft or profession of making such ware; a factory or workshop where such ware is made’ (*Concise Oxford Dictionary* 2003:886), while the term potter (from the French *potier*) is defined as ‘one whose occupation is to make earthen vessels’ (*Webster’s International Dictionary* 1898:1121).

Ceramics are one of the first and most enduring products of the ‘pyrotechnic revolution’ that to a great extent has defined humankind, and that still separates us from the rest of the animal kingdom. We know that the first stone tools in Africa have an antiquity of several million years (Jelínek 1975:84), but it is impossible to ascertain the date of the inception of pottery-making and use by our early forebears. What we do know is that the oldest known ceramic objects date back only tens of thousands of years, but humans could have been experimenting with soft, malleable sandy or earthy materials in considerably earlier times, probably as long ago as hundreds of thousands of years. Those first clays manipulated by early peoples could have been used for ephemeral products such as body paint or decoration with naturally-colored earths. But the defining moment for the history of the use of clay came with the application of heat that transformed it into a hard, durable resource. This transformation was a relatively recent achievement in prehistory, and it has allowed fragments of baked clay to survive for millennia to be found and studied by archaeologists in the present.

The earliest archaeological evidence for the use of baked clay objects goes back to the artistic traditions of the Upper Paleolithic (ca. 22,000 BP) in central-western Europe. In many Paleolithic caves one can see designs made with wet clay on walls and floors (Jelínek 1975: Figure 508), while another striking example of this emerging art form are the well-known ‘Venus’ figures, female representations with exaggerated sexual features like the ones made of raw or baked clay found in Dolní Věstonice, Czechoslovakia and dated around 32,000 BP (Bahn 1996:215-216). These examples show that by the Upper Paleolithic people knew the principles of working with clay: its plasticity, its capacity to harden when heated, and the need to add ‘temper’; i.e., solid substances to improve its qualities

and make it easier to work (Rice 1987:6-8). According to V. Gordon Childe, the need to prepare and store edible grains gave clay vessels unprecedented importance in early farming societies. By Neolithic times (ca. 8000-2000 BC), the manufacture of pottery vessels was a universal feature of all human cultures (Childe 1981:83).

The use of baked clay vessels did not originate in one single place or time in prehistory; in fact, it appears that this technique was invented independently in several unknown centers around the same time. In this regard, we should mention the Jomon complex of Japan, dated some 14,000 years ago (Clark 1977:324-325). In many places, the earliest ceramic items known archaeologically show shapes and decorations similar to those of earlier artifacts made of tree bark, gourds, wood, leather, or woven baskets. This similitude raises the possibility that items made of baked clay may have evolved from earlier practices of using this material to cover, repair, or reinforce containers such as baskets made of reeds, rushes or twigs (Rice 1987:8).

In the New World, several archaeological sites have been found where ceramic traditions appeared for the first time, usually in small quantities compared to later periods. This pottery is associated with hunter-gatherer societies that were nomadic or semi-sedentary (Pratt 1999:71). Several theoretical models have been proposed to explain the development of ceramic technology in the New World. The main ones emphasize the following factors: (1) food-processing; (2) food storage; and (3) feasting activities and food-serving (Pratt 1999:71).<sup>3</sup>

In the first model, cooking or food-processing is perceived as a response to the need to prepare food when societies first became agricultural and adapted to a more sedentary lifestyle. It could be argued that the adoption of pottery reflects changes in culinary practices toward a greater emphasis on seed-processing and the extraction of starches and oils.<sup>4</sup> Pottery also allowed for the direct firing of vessels used to store water or food, thus increasing the range of techniques available for food preparation, which came to include detoxification and the enhancement of the flavor of several foods (Pratt 1999:72).

The model of feasting activities and food-serving, meanwhile, assumes that some ceramic vessels were used primarily as prestige goods and not simple artifacts for food preparation. In other words,

<sup>3</sup> To these uses for early ceramics we should add the manufacture and use of objects that served as ‘status markers,’ and so expressed the first symbols of social differentiation between small human groups (Blake *et al.* 1995).

<sup>4</sup> We should also include here boiling pots for processing bones and skins, and pots used to ferment alcoholic beverages like *tesgüino* (Senior 2001) or pulque (Fournier 2007).

pottery bowls, dishes, trays, and so on, were used to impress people during demonstrations of wealth and competitive displays in ritual feasts (see Butterwick 1998). This model also links the origins of pottery to agriculture (Pratt 1999:72). Finally, as status symbols *per se*, some ceramic objects had no practical use beyond their exhibition or public display (such as figurines, representations of deities, etcetera).

Whatever the origins of pottery-making may have been, by the eighth millennium before the present we have evidence of the earliest ceramic 'traditions' in the New World. These pottery remains were found in a shell-midden near a river at the Taperinha site, a fishing village in the Amazon basin, Brazil, with an age estimated at 7110 years BP (Pratt 1999:72). Another early ceramic tradition was unearthed in Valdivia, Ecuador (*ca.* 5300-4300 BP). According to Pratt (1999), that pottery may have been made by coastal groups that subsisted mainly by exploiting maritime resources, and by agricultural groups inland. Other important indications of early ceramic production come from Colombia, where subsistence strategies included a whole range of activities, from mollusk-gathering to hunting and gathering of seeds. The ceramic complexes known from this area are Puerto Hormiga (5000 BP), Puerto Chaco (5200 BP), and San Jacinto (5900-4656 BP) (Pratt 1999:72).

In contrast, the earliest ceramic tradition so far documented for Mesoamerica is the so-called 'pox pottery' found on the coast of the state of Guerrero (Brush 1965) and in the Tehuacán Valley, Puebla, where it appeared early in the Purrón phase (*ca.* 2300-1500 BC). That ware seems to have been characteristic of certain sedentary societies with an agricultural subsistence base and a 'tribal' level of social organization (MacNeish 1981:132-133).

The transition from the Archaic (*ca.* 4000-1800 BC) to the Formative period (*ca.* 1500 BC-AD 100) is one of the least understood aspects of Mesoamerican archaeology, though this transformation of groups of hunter-gatherers (who lacked pottery) to sedentary societies has been studied in the Oaxaca Valley among other areas (Marcus and Flannery 1996). According to this body of research, at some point between 1900 and 1400 BC, people in the Oaxaca Valley began to make objects of baked clay in a limited number of shapes: hemispheric bowls and globular pots with or without necks. Generally speaking, the shape of those vessels mimicked that of vegetal containers, such as gourds (which, by the way, are still found in markets in the Oaxaca Valley, as the author observed in 1985). Extant samples of these early ceramic types are limited to no more than 400 potsherds found in archaeological contexts (Marcus and Flannery 1996:74-75). Another example that suggests early pottery manufacture

was uncovered in the Soconusco region of the state of Chiapas, Mexico, where the first phase of human occupation –Chantuto– pertains to the Archaic period. The general settlement pattern for this phase consisted of small nomadic groups whose lifeway depended on hunting, fishing, and gathering. Artifacts found in association with those people are scarce, just hammer stones and grinding stones made of pebbles, with a few obsidian flakes, but no pottery (Blake *et al.* 1995:165-166). The following archaeological phase in this region is called Barra (*ca.* 1550-1400 BC); the first phase documented for the Formative period on the Pacific coast of southwestern Mesoamerica. Pottery made its appearance in this phase, but is remarkable for its high quality of manufacture and wide range of decorative techniques (Blake *et al.* 1995: Figures 5 and 6). At that time, potters used monochrome slips, as well as two- or three-colored slips, incised decorations, zone stamping, and grooves combined to form a wide variety of surface finishes. The two known shapes are *tecomates* (neckless jars) with flat bottoms (85% of the sample) and deep bowls (the remaining 15%). The people who made and used these clay vessels have received the name 'Mokaya culture'. They used ceramic technology to complement or replace decorated gourds, probably for the purpose of serving food and drinks at public functions, rather than for utilitarian or domestic uses, such as food preparation or storage (Blake *et al.* 1995:167-168). The term Mokaya comes from the Zoque-Mixe language, which is what they probably spoke, as did the later Olmecs. The most notable characteristic of the Barra phase is its pottery (Clark 1994: Figure 3.2), a highly-decorated ware (primarily by burnishing) with a wide range of elegant shapes. This phase marks the beginning of an agricultural way of life with permanent settlements and a reliance on domesticated plants, including beans, avocado, maize and, probably, sweet potatoes and cacao. Fishing, hunting and gathering continued in the region's many rivers and lakes, but as a complement to agriculture rather than full-time occupations (Clark 1994).

In later periods of Mesoamerican cultural development, ceramic traditions reached high levels of sophistication in both artistic and technological terms. Several manufacturing techniques have survived to the present; for example, firing pots in the open without a kiln. Although pre-Hispanic potters generally used open hearths to fire their clay objects, recent archaeological finds at Monte Albán, Oaxaca (Winter and Payne 1976), Comoapan, Veracruz (Arnold *et al.* 1993), and Tlaxcala (Castanzo 2004, 2009), among others, attest to the presence of potters' kilns in the technological inventory of Mesoamerican ceramists. Known examples include complex pottery-firing techniques in the U.S. Southwest (Blinman 1993). Firing clay in kilns instead of open fires has many advantages: protection from wind and rain, higher temperatures, and better fuel efficiency, among

others (Arnold 1985; Rice 1987:153; Shepard 1980:75). It is interesting to note that various archaeological sites in Oaxaca and Veracruz provide evidence of the coexistence of both firing types: specialized structures like kilns and open-air bonfires (Pool 2000:61). These cases remind us that the advantages of kilns are not absolute. Until recent decades, most people thought that kilns were introduced into Mesoamerica by the Spaniards in the 16th century as part of a technological complex that included the potter's wheel and glazing (Foster 1955). European methods and techniques of ceramic manufacture contrast with pre-Hispanic technology, which was based on hand-modeling, the use of molds and --as was thought until recently-- firing in the open (Pool 2000:61; Williams 1995). But we now know that kilns were used long before the Spanish Conquest, with cases reported in ancient and modern Oaxaca (Feinman and Balkansky 1997) and the Sierra de los Tuxtlas, Veracruz, as mentioned above. According to Pool, in both ancient and modern contexts this variation in technology between two firing methods is a consequence of the level or intensity of production (Pool 2000:61, 72). Based on his ethnoarchaeological work among potters in the Sierra de los Tuxtlas, Veracruz, Philip Arnold (2005) linked the use of kilns or open fires to the availability of working space inside the potting compound.

### *Historical Background of Ceramic Studies in Mesoamerica*

Potsherds are usually a good source of chronological information for dating the archaeological contexts where they are found, because changing styles are one of the best clues for assigning time depth to the different strata or layers where pottery remains are unearthed. For this reason, archaeologists must learn everything possible about ceramics --their shape, decoration, and the slips and tempers used in manufacturing, as well as how pots were fired, among many other features-- in order to contextualize pottery-making from a technological perspective. The value of simple classifications based solely on vessel design or shape is limited. The creation of 'ceramic provinces' that in time became 'cultures' (a custom particularly evident among archaeologists in Western Mexico in the first half of the 20th century) is a consequence of this simplistic (and normative) use of formal features that ignores other types of analysis, such as x-ray diffraction and neutron activation, that can help us study pastes, clays, slips, and pigments (Weigand 1995). Also omitted from those early studies were the ethnographic and ethnohistorical components of Mesoamerican pottery production.

Because of its durability, pottery is often the most abundant material found in archaeological excavations. Many ancient indigenous peoples produced huge amounts of clay objects, which were discarded after breaking or becoming useless, thus forming superimposed layers of

deposition. Once scholars recognized this phenomenon, a new chapter began in the history of archaeological thought and practice in Mesoamerica and elsewhere (Bernal 1981:162). In 1784, Thomas Jefferson --later the third president of the United States-- set out to investigate the nature of some funerary mounds on his property in Virginia. Jefferson had the unusual idea of performing a relatively well-controlled excavation that consisted in carefully digging a trench through the mounds. This allowed him to recognize different strata, making him a precursor of archaeological stratigraphy. Jefferson's excavations were ahead of their time by at least one hundred years, and he is now regarded as a pioneer in the methods and approaches of modern archaeology (Willey and Sabloff 1980:28).<sup>5</sup>

In 1894-95, Sir William Matthew Flinders Petrie excavated the Pre-dynastic site of Naqada on the west bank of the Nile River, a cemetery with over 2,000 tombs that gave its name to the Naqada period of Egyptian prehistory. Petrie ordered the ceramic materials he found using a technique he called 'sequential dating,' based on typological changes seen over time in superimposed burials (Daniel 1981:118). While Petrie was working in Egypt in the late 19th century, several archaeologists in North America, notably Frank Cushing among the Zuñi Indians of New Mexico, were pursuing a functional explanation of the shapes of prehistoric artifacts that involved comparing them to artifacts manufactured by modern native informants. Around the same time, Franz Boas recognized the potential of stratigraphy (a concept he borrowed from geology) for archaeology in the New World (Willey and Sabloff 1980:79). Also in the late 19th century --1892 to be exact-- Max Uhle began the fieldwork that would keep him occupied intermittently for the following 30 years in the Andean area of South America. Uhle developed a four-period cultural sequence using the concept of 'horizon style,' based on stylistic changes observed in pre-Hispanic ceramics. This method is still in use today, despite the time that has elapsed since its inception (Willey and Sabloff 1980:79).

Moving forward to the early 20th century, we find that the first archaeological research in Mesoamerica that used the stratigraphic method occurred in the Basin of Mexico. Manuel Gamio, influenced by Boas, his teacher (who was in Mexico at the time, teaching at the International School of Archaeology and Ethnology), explored a deep pit in Culhuacán and a mound in San Miguel Amantla. Gamio called these explorations 'the

<sup>5</sup> Though Jefferson has traditionally been credited with the first archaeological excavation in the New World (Daniel 1981), we should remember an earlier instance of systematic excavation, performed by Don Carlos de Sigüenza y Góngora in Teotihuacan. This illustrious Mexican scholar was responsible, in 1675, for the first truly archaeological exploration, with goals and methods that distinguished it from a mere 'search for treasures' (Schavelzon 1983:121-122).

first and only excavation carried out with scientific methods in the Valley of Mexico' (Gamio 1928). This research led him to define the Archaic-Teotihuacan-Aztec sequence, though he could not extend it to the rest of the Valley, much less to areas beyond it (Bernal 1981:164). Gamio's unique place in the history of Mexican anthropology was cemented because he pioneered a holistic approach to research, as is evident in his monumental work, *La población del valle de Teotihuacan* (Gamio 1922 [1979]).

When Gamio's most influential work –*Forjando patria* (Forging a Fatherland)– was published in 1916, the Mexican Revolution (ca. 1910-1920) was still raging. As a result, the book is permeated by a certain angst regarding Mexico's identity as a nation and doubts as to the possibility of integrating all sectors of society into a single 'fatherland' that would entail the cultural assimilation of indigenous peoples (Gamio 1916, 2010). *Forjando patria* is a collection of 34 essays, most published earlier in Mexican newspapers and magazines on such themes as: fatherlands and nationalities of Latin America; the department of anthropology; the redemption of the indigenous class; prejudices against the indigenous race and its history; sociology and government; knowledge of the population; considerations on statistics; artworks in Mexico; the concept of pre-Hispanic art; art and science in the Independence period; the department of fine arts; the synthetic concept of archaeology; the values of history; politics and its values; our religious transition; our intellectual culture; language and our country; national literature; our national industry; revolution; and three nationalist problems.

In the introduction to the English edition of this book (2010), the editor-translator, Fernando Armstrong-Fumero, discusses the 'nationalistic interpretations and uses of the pre-Hispanic past as marks of the fundamentally nonscientific criteria' that governed Mexican archaeology in Gamio's day (p. 9). Still today in Latin America, the cases of Mexico and countries such as Peru are most often mentioned to show how 'archaeological symbols and pre-Hispanic elements have been used to sustain a near-sacred sense of each nation-state's historical aura... the Mexican archaeological establishment found itself strongly supported by a... state interested in exploiting a past that legitimized its claim to political power and national pride' (Benavides 2001:357). This exaltation of the 'glorious Indian past' in many Latin American nations has gone hand-in-hand with the exploitation and degradation of most indigenous groups, which are seen as subordinate members of society, if not 'second-class citizens.'

For Gamio, indigenous groups like the Maya, Yaqui, and Huichol, possessed a nationality that was 'clearly

marked by their respective language and by their cultural and physical natures... [however,] their natures are and have always been unknown to groups of European origin... [which is] an unpardonable crime against Mexican nationhood. Without knowing those groups' characteristics and needs,' he argued, 'it would be impossible to seek their incorporation into a national culture' (Gamio 1916, 2010:29). In discussing the concept of culture, Gamio states that 'modern anthropology has established the fact that culture is the conjunction of all of the material and intellectual features that characterize human groups... culture is developed by the collective minds of people; it emerges from their historical antecedents and from the environment and circumstances that surround them' (p. 103).

In accordance with these ideas, Gamio adopted a holistic approach in his monumental work *La población del valle de Teotihuacan* (1922), which set the agenda for anthropological research in Mexico for generations to come by covering a wide range of topics from a multi-disciplinary perspective: social and cultural anthropology, archaeology, geography, biology, architecture, history, folklore, education, and economics, among others. In addition, and as stated previously, Gamio was the first scholar to undertake archaeological work in Mexico using scientific methods such as stratigraphy, which allowed him to establish the cultural sequence that preceded the Aztecs in central Mexico. He was a true pioneer in both holistic anthropology and scientific archaeology, which gave great weight to cultural processes reflected in ancient pottery.

However, Gamio may have been wrong in thinking that the 'fusion of races, convergence and fusion of manifestations of culture, linguistic unification, and the economic equilibrium of social elements are concepts [... which] indicate conditions that must be established in the Mexican population, so that it may constitute and incarnate a powerful [fatherland] and coherent and defined nationality' (p. 164). Mexico's rich Mesoamerican past was strongly-based on its unique characteristics as a multi-ethnic, multi-cultural mosaic. Instead of stressing these qualities, Gamio's concept of 'nationalism' and cultural assimilation may have formed part of a hegemonic discourse promoted by the Mexican state in its efforts to dominate the subordinate groups of society and incorporate their labor into the expanding capitalist economy.

*Forjando patria* is still very much as relevant today as when it was written in the early 20th century. It should be read by everyone with an interest in the changing concepts of nationalism, nation-building, state formation, cultural assimilation, and inter-ethnic relations, which today should be understood in the context of a globalized, post-colonial struggle for world domination (Williams 2011).

In the same period that Gamio was working in central Mexico, Alfred Kroeber led an archaeological expedition to Nazca, Peru (1926) that allowed him to produce ‘the largest documented collection of Nazca mortuary goods in existence. No collection of this nature and size has ever been published in such detail... the reader will find individual descriptions of over 350 ceramic vessels, and... [many] nonceramic artifacts’ (Carmichael 1998:18). The volume based on this significant archaeological project is *The Archaeology and Pottery of Nazca, Peru* (Kroeber and Collier 1998). According to the book’s editor, ‘this volume... represents Kroeber’s final thoughts on Nazca pottery—a subject that occupied him throughout much of his career. Introduced to Nazca studies by Max Uhle in the early years of [the 20th] century, Kroeber published Uhle’s collection from the Ica valley... in 1924.’ One year later, ‘Kroeber worked in several valleys on the central and northern Peruvian coast and made a short reconnaissance down to Nazca... Kroeber’s first two seasons in Peru were remarkably productive’ and ‘in later years, he devoted much of his Andean writings to documenting the 1925 findings’ (Carmichael 1998:18). The field methods employed during the 1926 excavations ‘were remarkably thorough for the era; indeed, such standards were not applied in the region again until the 1950s...’ (p. 19). Kroeber was also ahead of his time ‘in the use of stratigraphy’; in fact, his work in Peru ‘marked the first systematic use of stratigraphic excavation... Although standard practice today, the principles and applications of stratigraphy were largely unrecognized in 1926... Kroeber’s work... is as valuable and applicable today as it was in 1926’ (Carmichael 1998:19).<sup>6</sup>

The mid-1950s brought the first published synthesis of scientific analyses of Mesoamerican ceramics, penned by Anna O. Shepard. Her book, *Ceramics for the Archaeologist* (original 1956, 10 re-printings up to 1980), is the definitive source of information on archaeological ceramics and its publication was a watershed event in archaeological literature; one that inspired a wide range of specialized analytical procedures, including x-ray fluorescence, spectrography, and neutron activation, among others. Shepard’s book is an indispensable source of information for archaeologists, as it presents with clarity the essential facts concerning ceramic processes and materials. Indeed, it gives new meaning to the properties inherent to ceramics by evaluating analyses and descriptive methods in relation to their archaeological goals. Also covered in detail are the properties and sources of ceramic materials, with a summary of knowledge on this subject as it pertains to archaeological interests. The section on ‘ceramic practices’ is based largely on the methods

used by non-industrial or ‘peasant’ potters, because Shepard believed that they offered many parallels to prehistoric techniques. The book provides suggestions for ethnologists as to how knowledge about pottery will enable researchers to produce more complete and useful recordings of material culture (*i.e.* ceramics), while the discussion of ceramic analysis touches on such variables as shape and decoration, physical properties, the composition of materials, and manufacturing techniques. Shepard’s study ends with a discussion of the interpretation of information on ceramics that deals with the following aspects: identification of ‘intrusive’ (*i.e.* out of context) ceramic objects; relative dating based on pottery; social relations between different groups in the past suggested by distinct ceramic styles; economic aspects of pottery; and finally, the contribution of ceramics to the study of cultural history (Shepard 1980).

Another important and momentous contribution to ceramic studies appeared a decade after Shepard’s book: Frederick Matson’s *Ceramics and Man* (1965), which set out to establish the basis of what would come to be known as ‘ceramic ecology,’ an analytical method discussed at length later in this chapter. In the same period as Shepard and Matson, George Foster (1948, 1955, 1960, 1965) emerged as another pioneer in the anthropological study of ceramics from a holistic perspective by publishing some of the first works that can be called ‘ethnoarchaeological’ (though this word was not used at the time). In this context, we should also mention May Diaz’s work in the village of Tonalá, Jalisco (today a suburb of Guadalajara), which is now a craft center of world-wide reputation. In her book *Tonalá: Conservatism, Responsibility, and Authority in a Mexican Town*, Diaz examines ‘the nature of culture change in general and of industrialization in particular’. She was ‘concerned with ascertaining the social and cultural changes which come to traditional societies... as a response to economic growth’ (Diaz 1966:2). This research was carried out among potters in Tonalá as that former Indian village was being absorbed by the growing, bustling urban growth of Guadalajara, the state capital and a thriving industrial center.

Also in the mid-1960s, Eduardo Noguera published an encyclopedic volume called *La cerámica arqueológica de Mesoamérica* (1965, second printing in 1975), which was then the most exhaustive discussion of the different pottery traditions in Mesoamerica over time. It was a landmark when it appeared, and is still a fundamental work for archaeologists, anthropologists, and other scholars interested in this subject. A decade later, a very important addition to the anthropological literature on pottery-making in Mesoamerica appeared: Rubén Reina and Robert M. Hill’s *The Traditional Pottery of Guatemala* (1978). It provides a comprehensive description of the different styles and techniques of manufacture found in

<sup>6</sup> But we should note that Alfred Kidder, George Vaillant and others were working in the Basin of Mexico and the Maya area at the time, applying similar ideas and methods to Kroeber’s.

Maya communities throughout Guatemala, enlivened by excellent photographs and vivid descriptions of a disappearing craft and a wider cultural tradition with still-discernible pre-Hispanic roots that was extant at the time.

In 1987, Prudence M. Rice published a book of encyclopedic scope on pottery based on her long record of scholarly research in Mesoamerica and South America, and an equally long list of publications on a wide range of topics: Maya political science; the collapse, transition and transformation of ancient Maya civilization; the origins of pottery; the prehistory and history of ceramic kilns; and Peru's colonial wine industry and its European background, etcetera. The book that interests us here is Rice's *Pottery Analysis: A Sourcebook* (1987, second edition, 2015). The new edition (2015) incorporates more than two decades of growth and diversification in the archaeological and ethnographic study of pottery, and examines the raw materials used by potters worldwide in terms of their physical and chemical properties. Rice's study uses archaeological, materials science, ethnographic, and ethnoarchaeological perspectives on pottery production, and discusses how analyses of artifacts can provide insights into their culture of origin, be it prehistoric, recent, or contemporary.

Another important book is *Pots and Potters: Current Approaches in Ceramic Archaeology*, edited by Prudence Rice (1984). This volume was conceived as a continuation and updated version of Matson's *Ceramics and Man*, with a primarily anthropological emphasis that sought to show how ceramics from different geographic and time contexts, when studied with the appropriate methods and analytical approaches, can provide valuable information about the people who fashioned and used the myriad ceramic artifacts found by archaeologists. Another important publication from that period is Dean Arnold's *Ceramic Theory and Cultural Process* (1985), in which the author sets out to develop a 'theory of ceramics' to further our understanding of the complex relationships among pottery-making, culture, and society. His use of the theoretical perspectives of systems theory, cybernetics and cultural ecology allows Arnold to make transcultural generalizations to explain the origins and evolution of the potter's craft. This study offers an innovative approach to archaeological interpretations of pottery that considerably increases our ability to comprehend social, cultural, and environmental processes that encompass ceramic production.

In the book *Acatlán: A Changing Mexican Tradition*, Louana Lackey (1982) describes the materials, methods of manufacture, and forms of decoration characteristic of the pottery of Acatlán, Puebla. Lackey discovered that Acatlán's Mesoamerican ceramic tradition dates to the Classic period (ca. AD 100-900). By studying pre-Hispanic potsherds, she was able to establish that

potters in Acatlán were working within a tradition that had considerable time depth. Lackey's conclusions are based on ethnographic research and archaeological fieldwork carried out in 1974, 1975 and 1977 in Puebla, where she worked with a family of craftspeople learning to make, decorate and fire the ware in the kiln according to the *Acatleco* –i.e. native Acatlán–style. Although current vessel shapes may be new, the clay used to make them is identical to that employed to produce the famous pre-Hispanic ware known as Thin Orange, or *Anaranjado Delgado*, a ceramic type pertaining to the Classic period that was traded all over Mesoamerica, and whose exact provenience was only discovered recently.<sup>7</sup>

The book *Ceramic Ecology Revisited, 1987: The Technology and Socioeconomics of Pottery*, edited by Charles C. Kolb (1988), consists of two volumes with a collection of papers that report studies of ceramic artifacts and manufacturing processes, spanning aspects from raw materials procurement to methods of manufacture and decoration, to firing techniques and the distribution of finished products, with reflections on the cultural implications of all these observations. These contributions deal with a wide range of subjects including, among others, technical analyses of specialized ceramic products like *tuyeres* (blow tubes used in casting iron) and *candeleros* (portable incense burners). Also considered here are ethnographic studies of the manufacture of clay pots, processes of innovation and the diffusion of technologies (like some kinds of kilns and the *tornete*, or turntable), physical-chemical analyses of materials (clays, aplastics, potsherds) and, finally, functional and sociocultural interpretations of the pottery vessels and the people who made and used them. In their discussions of ceramic containers and other baked clay artifacts, all the authors sought to explore the interrelations between technical aspects of production and distribution and the sociocultural parameters linked to them.

A companion volume presents a second collection of essays also edited by Kolb (1989), entitled *Ceramic Ecology 1988: Current Research on Ceramic Materials*. Here we find new concepts, methods and paradigms that include ceramic ecology, ceramic theory, and ethnoarchaeology. The articles reflect the multi- and interdisciplinary approaches used in the study of ceramic materials, as well as in analyses of the production and use of pottery artifacts. Most of the papers pertain to Mesoamerica, but there are contributions based on many other regions of the world, such as North America and Asia.

<sup>7</sup> Archaeological research by Evelyn Rattray (1990) in southern Puebla offered new data on pre-Hispanic ceramic workshops where the manufacture of Thin Orange ware –the most important trade pottery of Teotihuacan culture– took place. Rattray's report includes data on manufacturing techniques, production contexts, and the economic and social organization of the craftspeople involved.



Another collective volume published around the same time is *Kalinga Ethnoarchaeology*, edited by William Longacre and James M. Skibo (1994), a book based on twenty years of research in the highlands of northern Philippines. The papers assembled here examine pottery and basket-making in several Kalinga villages, revealing how people in a cultural setting pertaining to a tribal group like the Kalinga make, use, break, and discard their clay objects, and how pottery, woven baskets, and other items of material culture are related to human behavior. The contributing authors analyzed a single set of ceramic data from different angles that reflect both traditional interests and new trends in the studies of village ethnoarchaeology. These essays adopt different perspectives of archaeological method and theory to examine the question of the correlation (or lack thereof) between social and material limits; how the use given to vessels may be inferred from the physical alterations caused by that use; why more large pots are broken in larger households; the relationships between household wealth and material possessions; how a system of ceramic distribution operates; and finally, how and why technological change comes about.

Many other works could be mentioned, but for reasons of space I cite only the following titles and authors: *A Pot for All Reasons*, edited by Charles Kolb and Louana Lackey (1988); *Ceramic Ethnoarchaeology*, edited by William Longacre (1991a), and *The Many Dimensions of Pottery: Ceramics in Archaeology and Anthropology*, edited by S. E. van der Leew and A. C. Pritchard (1984). In all these volumes, the reader will find innovative approaches that explore the anthropological, ecological, and ethnoarchaeological dimensions of potting activities and ceramic production in general, both in ancient and recent times. Last but not least, this holistic approach to ceramic studies has been carried on by Dean Arnold in several recent volumes that set the agenda for future research in the 21st century: *Social Change and the Evolution of Ceramic Production and Distribution in a Maya Community* (2008); *The Evolution of Ceramic Production Organization in a Maya Community* (2014); and *Maya Potter's Indigenous Knowledge: Cognition, Engagement and Practice* (2016, in press).

At the end of the 1950s and beginning of the 1960s, physical-chemical analyses of ceramics became increasingly popular among archaeologists, and this is still a commonly-used technique. The most common methods of chemical characterization at present are optical emission spectroscopy, x-ray diffraction, x-ray fluorescence, atomic absorption spectroscopy, and neutron activation analysis (NAA, see Rice 1987:312, 373). The latter was first used in the 1930s and came to be applied to archaeological problems in the 1950s. It has since become the most important technique for studying the elements present in ancient artifacts. The principle behind NAA is as follows: as the radioisotopes

present in a ceramic sample decay, they produce radiation with distinct types of energy, each one corresponding to a certain element. This energy is measured with a spectrometer to identify the different elements present. NAA is highly-sensitive as it is able to detect 75 of the 92 elements that usually appear in trace amounts (Rice 1987:396-397; Glascock 1992).

All these studies emphasize research that employs scientific methods to solve archaeological problems related to the production and use of ceramics. For example, detailed composition analyses of ceramics have often been performed to explore such processes as ancient trade, but they can also offer inferences concerning ceramic production in general, since the selection and processing of raw materials in antiquity is reflected directly in compositional data (e.g. Nieves *et al.* 2003:27). Such scientific analyses help detect the use of resources from outside the production area that were procured through some sort of exchange pattern, involving either finished products or clays and other raw materials (Bishop *et al.* 1982:275-276). But it has become apparent that scientific studies alone are insufficient to obtain a complete picture of ceramics in cultural and historical context. As a result, ceramic ecology and ethnoarchaeology entered the scene, as discussed below.

### **Ceramic Ecology**

The 1960s and 1970s brought several important contributions to the study of ceramic ecology that spurred additional advances in the 1980s and 1990s. One particularly important stimulus was the symposium series organized by Charles Kolb and Louana Lackey at the Annual Meetings of the American Anthropological Association, which began in the mid-1980s and is still going strong. There, scholars from many fields have shown the impact of the ecological perspective on ceramic studies in archaeology and anthropology. Ceramic ecology has thus been established as an analytical approach to ceramic materials with contextual, multi- and interdisciplinary perspectives through which researchers seek to place physical and scientific data in an ecological and sociocultural framework by relating the technological properties of raw materials to the manufacture, distribution, and use of ceramic products within social contexts. Ceramic ecology perceives cultural systems holistically, as explained in **Figure 1** (Kolb 1988:viii). Hence, it is linked to the general field of cultural ecology –or human ecology– which is defined as ‘the study of the relationships and interactions between humans, their biology, their cultures, and their physical environments... Human ecologists study... how and why cultures do what they do to solve their subsistence problems, how [they] understand their environment, and how they share their knowledge of the environment’ (Sutton and Anderson 2004:2-3).

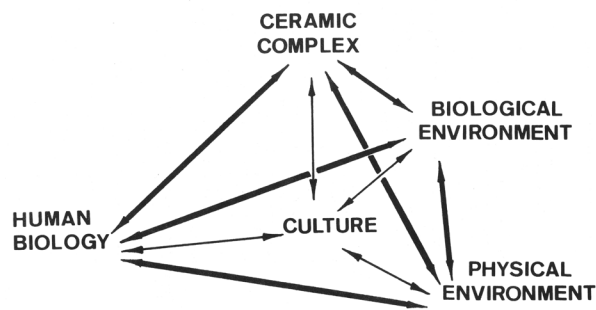
**CERAMIC ECOLOGY:**

FIGURE 1. DIAGRAM OF CERAMIC ECOLOGY, INCORPORATING THE CERAMIC COMPLEX, THE BIOLOGICAL ENVIRONMENT, THE PHYSICAL ENVIRONMENT, HUMAN BIOLOGY, AND CULTURE (AFTER KOLB 1989A: FIGURE 3).

Frederick R. Matson, an early proponent of the ceramic ecology approach, was a ceramic engineer, ethnographer, and archaeologist specialized in archaeometry. In recognition of his many academic achievements, he received the Archaeological Institute of America's Pomerance Award for Scientific Contributions to Archaeology (1981). His edited book entitled *Ceramics and Man* pursued a 'cross-fertilization' that examined the social processes and factors involved in ceramic studies. This volume presents a critical and constructive revision of the kinds of contributions usually made by ceramic analysis to archaeological and ethnographic research. Matson's proposal involved linking ceramic objects with the people who made and used them (Kolb 1988:vi-vii; Matson 1965). In 1951, Matson commented on ceramic studies in contemporary archaeological reports. He stated that while most of them provided good descriptions, he wondered how many readers would take the time to read or try to visualize ceramic objects once they had been described at the cost of so much time and diligent labor. In his opinion, it would be more productive to spend less time on ceramic descriptions in terms of physical measurements, and give greater consideration to the variations in the wares linked to the problems faced by the potters in their manufacturing processes (Matson 1951:106).

Matson further encouraged researchers to undertake careful examinations of the ethnographic literature and implement ethnographic research designs with an archaeological orientation (*i.e.* ethnoarchaeology) in order to shed light on the technical aspects of ceramics and pottery. The lack of common ground between ceramic studies and the analysis of socioeconomic patterns was a preoccupation that began to emerge in the late 1950s, but ecological paradigms offered a productive way to address these variables (Kolb 1989:281).

Kolb (1989), meanwhile, presented a model that allows us to obtain a clear grasp of what he calls 'holistic

ceramic ecology'. This model of ceramic production centers on a *ceramic complex* that consists of a cultural system and an environmental system, each one with subsystems necessary for the operation of the complex. The cultural system includes the following subsystems: economic, social, religious, psychological and, of course, the ceramic production subsystem itself. The environmental system consists of physical, biological, and environmental-cultural subsystems. These systems and their respective subsystems are mutually linked by feedback mechanisms. According to Kolb (1989:315, 320, 324-327), the key component of the ceramic complex is the ceramic production subsystem, which contains the main variables that affect the production of a clay object: from raw material procurement to the use and discard of the vessel at the end of its functional life.

### *Ceramic Ethnoarchaeology*

As stated at the beginning of this chapter, sociocultural anthropology has been rather indifferent to the technological and material perspectives that are so important for archaeology and holistic anthropology. This indifference is related, to some extent, to the reaction against science that today is quite prevalent among the humanities and social sciences, and has culminated in the 'post-modern movement'. Because of this perspective's antagonism towards science, it seems natural that new ethnographers (especially social anthropologists) would ignore or minimize the role of material culture and technology, including ceramics (Williams 2005).

Ethnoarchaeology appeared in part as a response to this situation, but also to the development of processual archaeology with its focus on explicit bridging arguments between patterns of human behavior and material patterns in the archaeological record. The ethnoarchaeological approach seeks to integrate archaeological finds and contexts with ethnographic information to better interpret material culture, so one of its goals is to obtain information on artifacts and technologies directly from the people who were involved in their production. The usual objective of ethnoarchaeological research is to gain a more thorough understanding of the relationship between human behavior and the contexts of material culture (Kolb 1989:292-293). Archaeologists who adopt the framework of ethnoarchaeology are really anthropologists who conduct ethnographic research with archaeological ends in mind by linking material remains with the human behaviors that produced them (Thompson 1991:231). While living at a particular site and observing its inhabitants' activities, the ethnoarchaeologist attempts to discern patterns that would be observable to the archaeologist and strives to figure out what activities produced them (Binford 1983:25).

Archaeology is the only social science whose main subjects of study –the patterns and processes of past human behavior– are not visible to researchers. Hence, archaeologists must use indirect evidence to formulate hypotheses that will help us understand the relationship between the fragments found in the field and the social conduct that produced those material remains. In Mesoamerica and other areas, ethnographic analogy is invaluable because many processual questions related to patterns of the production, use and discard of pottery (and many other cultural materials) in the past cannot be answered satisfactorily using traditional archaeological techniques; *i.e.*, excavation, surface survey, and physical analyses of ceramic, stone, shell, bone, and other remains. Therefore, many archaeologists have turned to the study of manufacturing techniques and patterns of utilization of ceramics in contemporary communities using the ethnoarchaeological approach. Clearly, there is a series of questions related to the archaeological record that can only be resolved through processual research that goes beyond this record; for instance, how a specific context was formed by behavior within a cultural system; how a cultural system produces material (*i.e.*, archaeological) remains; and the kinds of cultural variables that determine the structure –as opposed to the form and content– of the archaeological record (Schiffer 1995).

Another important viewpoint on this discussion comes from Alison Wylie, who holds that archaeologists should always ‘treat interpretive claims as the starting point, not the end point, of inquiry’ (Wylie 2002:xii). In order to assess the implications of archaeological data, archaeologists have ‘to develop ‘arguments of relevance’ or ‘bridging arguments’ that link surviving elements of the archaeological record to the past events and conditions that produced them...’ (Wylie 2002:17). As mentioned above, the ultimate goal of ethnoarchaeology is to produce ethnographic information by observing cultural behaviors and their association with material objects in a *systemic context* (Figure 2) (*i.e.*, operating within a behavioral system, Schiffer 1978). The activities in which a durable element participates during its life, or systemic context, may be divided into five processes: procurement, manufacture, use, maintenance, and discard. Not all elements follow a unilineal path through a system, as some items are rerouted at strategic points to phases through which they have already passed. This is known as reuse, which has two varieties: recycling (for example, precious metals and gems are usually recycled) and lateral cycling (after the termination of an element’s use-life in one set of activities it is reincorporated into another) (Schiffer 1995: 27).

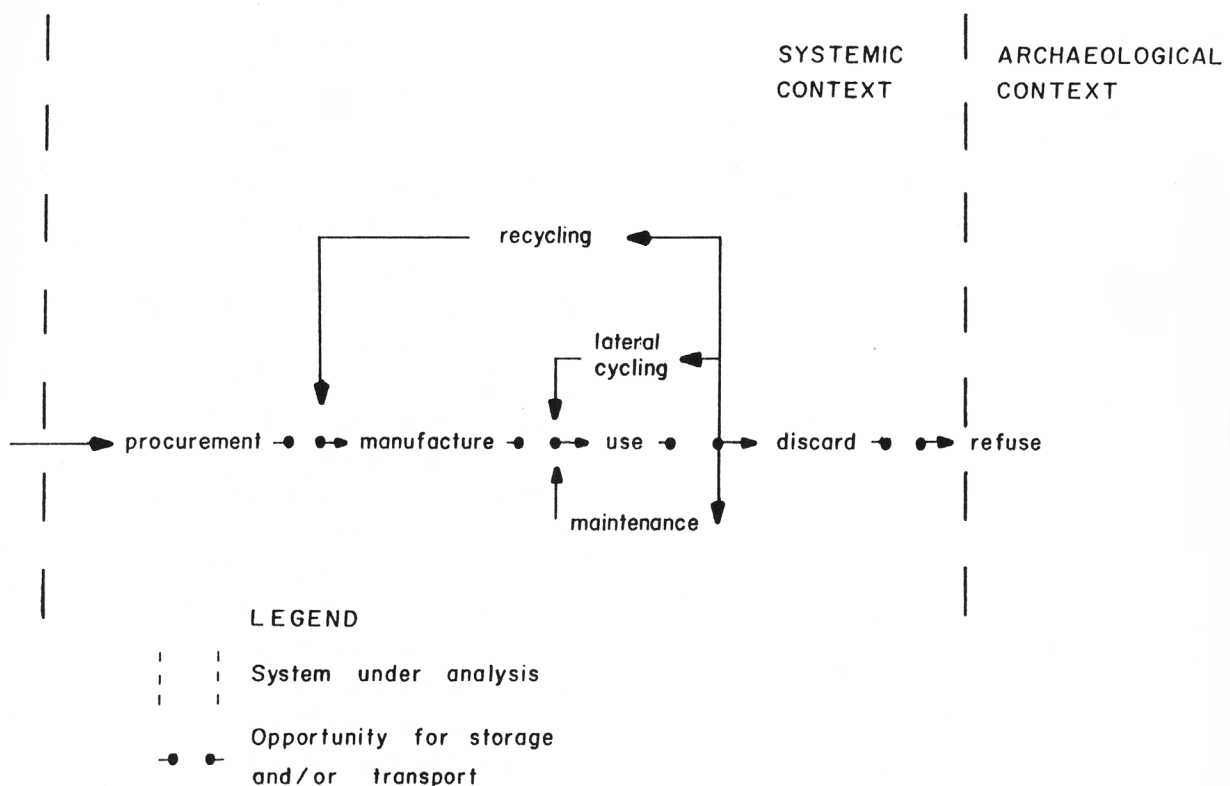


FIGURE 2. MICHAEL SCHIFFER'S FLOW MODEL FOR VIEWING THE LIFE-CYCLE OF DURABLE ELEMENTS IN THE ARCHAEOLOGICAL RECORD (ADAPTED FROM SCHIFFER 1995: FIGURE 2.1).

Ethnographic analogy, if used cautiously, may be very important in helping us better understand the cultural and technological aspects of a traditional craft, such as pottery-making, by adding time depth to our observations. However, several general principles must be followed to ensure that ethnographic analogies are useful for archaeological reasoning.

This topic has been amply discussed by Nicholas David and Carol Kramer, who sustain that the ‘subject and source cultures should be similar with regard to variables likely to have affected or influenced the materials, behaviors, states, or processes being compared... If the source culture is the historic descendant of the subject culture, there is... a greater intrinsic likelihood that similarities between the two will exist’. But the concept of cultural descent must be regarded as at least potentially problematic. The range of candidates as source models for comparison with subject data should be expanded to include ethnography, ethnohistory, and archaeology, ‘in order to obtain as representative a range as practically possible... However, owing to the inevitable elements of inductive reasoning and subjectivity involved in testing, deductive certainty can never be achieved’ (David and Kramer 2001:47-48).

Ethnographic analogy cannot inform about prehistoric patterns of behavior in the absence of some modern counterpart. Moreover, our knowledge of existing cultural systems is incomplete, so by broadening their ethnographic knowledge archaeologists can come to understand alternative behavioral models that would be unavailable in the absence of analogy. Ethnographic models are useful for suggesting hypotheses that are relatively free of ethnocentric bias and can be tested, but it is important that ethnoarchaeology go beyond mere analogy (Gould 1978:52).

In his discussion of ethnoarchaeology, Bruce G. Trigger argues that Lewis Binford, a major proponent of this research strategy, thought that ‘only by studying living situations in which behavior and ideas could be observed in conjunction with material culture was it possible to establish correlations that could be used to infer social behavior and ideology reliably from the archaeological record...’ Binford saw ethnoarchaeology as ‘a promising approach to understanding the past because... he believed that there was a high degree of regularity in human behavior which comparative ethnographic studies could reveal. These regularities could then be used to infer many behavioral aspects of prehistoric cultures’ (Trigger 2006:399).

I cannot present a more thorough discussion of this complex topic here due to lack of space, but Chapter II focuses on the intimate and productive relationship between archaeology and anthropology, and the role of ethnoarchaeology as a bridge between these two

disciplines. In the following section I address the topic of pottery manufacture and other production activities in the context of Mesoamerican households. This is important in order to contextualize the discussion of pottery-making activities in Michoacán presented in later chapters of this book.

### Household Production in Ancient Mesoamerica

Most of the production activities discussed in this book took place in households. In this regard, the present ceramic industry of the Tarascans of Michoacán is similar to pottery production patterns of the past, which also relied on a household mode of production. In fact, it has been said that ‘household production, even of a non-domestic nature, was a family affair, and any discussion of the organization of production in ancient Mesoamerica must consider the organization of the family’ (Healan 2014). Household studies have benefitted from renewed interest in the last few years all over the world. A good example of this is the book *Material World: A Global Family Portrait* (1994), in which Peter Menzel sets out to ‘capture... the great differences in material goods and circumstances that make rich and poor societies... noting the different landscapes, the dwellings, the family sizes, and above all, the... array of each family’s material goods, large or small...’ (Kennedy 1994:7).

In order to improve our understanding of the cultural, social and economic contexts in which the pottery-making activities studied by archaeologists took place, this section discusses several key aspects of domestic production in ancient Mesoamerica (see also Williams 2016a). According to Kenneth Hirth, households are the most important social entities of humankind, since all human beings are born in them, are raised and fed there, and often receive their education there as well. Indeed, in pre-modern societies, most goods were manufactured, stored, and consumed inside households. Hirth holds that the term ‘domestic economy’ refers to both what households do, and to the manner in which they are organized in order to satisfy their physical and social needs. Because the household economy has always been the backbone of society, households have also always been important for the wide range of subsistence activities they perform for the benefit of their members (Hirth 2009a:13).

Some recent approaches to the study of domestic production in Mesoamerica have adopted a holistic perspective that attempts to reach a definition and explanation of the organization and technology of the entire craft-producing process, from the acquisition of the necessary inputs to the uses given to the finished products. Another aim has been to attain an understanding of the social conventions and institutions, value systems, distribution mechanisms, and functions of products, all of which influence their

design, distribution, use and meaning. In short, the ultimate aim of this holistic approach is to achieve a comprehensive understanding of the material, technological, social, and ideological components of craft-producing systems, while also elucidating their historical, natural, and social context on a regional level (Shimada and Wagner 2007:166-167).

We know that craft specialization existed in Mesoamerica from pre-Hispanic times. Among the Aztecs, for example, domestic production used family members as the work force (Feinman 2001:191). There is clear archaeological evidence for craft specialization from early times; for example, in the production of objects made of stone, marine shells and pottery, among others. At some ancient sites in Oaxaca, for instance, archaeologists have discovered the specialized production of objects such as shell ornaments and magnetite mirrors, which were elaborated in quantities that far exceeded probable local requirements. There can be no doubt that those goods were produced by skilled artisans, so these non-agricultural activities are examples of work carried out by specialists (Feinman 2001:192). In present-day Mexico, we still see potters and many other full-time artisans working inside their house lots, following a custom that has its roots in the pre-Hispanic era (Feinman 2001:193).

According to Hirth, the study of craft production is an important field within archaeological research, because this phenomenon is easily identifiable in the archaeological record through the tools used and the refuse materials that are diagnostic of several manufacturing activities (Hirth 2011:13). Studying craft production, therefore, offers an approach to understanding the scale and organization of work groups in a given society, for this was a key component of all ancient Mesoamerican societies where the vast majority of the goods elaborated were made in domestic contexts by independent artisans (Hirth 2011:13).

Hirth also argues that the dichotomy between full-time and part-time specialists does not explain how, or why, craft production emerged primarily as a household activity. The reason for this is obvious if we consider the question from the perspective of the individual craftsman or woman, since part-time production is more compatible with the goals of production and the needs of the craftspeople who work in household settings. This has to do with economic risk, the changing nature of demand, and the way in which craft production was structured in fluctuating cycles (Hirth 2011:18).

Cathy Costin (2005), meanwhile, holds that archaeologists have used the term 'craft production' in an uncritical way to refer to the manufacture of a wide range of objects including pottery, stone tools,

ornaments, baskets, textiles, and metal artifacts. In this regard, she is quite correct, for the word 'craft' has many meanings, which have not yet been defined in an unambiguous way (Costin 2005:1032). Costin (2004) further maintains that craft goods were of tremendous importance in the production and maintenance of ancient chiefdoms and states, since in addition to their basic domestic functions they were also used in virtually all social, political and ritual activities. Hence, an understanding of the context and organization of craft production is indispensable if we are to fully understand daily life, political economy and the role of material objects in social and political relationships (Costin 2004:189).

As these observations make clear, studies of craft production are indispensable to archaeological research, and are basic to reconstructing ancient lifeways and explaining sociocultural evolution (Costin 2004:190). Research on craft production is also an integral part of inquiries into the role of material culture in domestic, social and ritual life. Most objects in pre-industrial societies are simultaneously utilitarian (in the broadest sense of the word) and means of social communication; therefore, material culture is inseparable from expressions of identity, power and social relations. Here, the concept of *materialization* acquires importance, as it refers to the process of transforming intangible ideas and beliefs into concrete, visible symbols and signs. Craft production is materialization, for craftspeople take ideas related to daily sustenance, social identity and power relations, and shape them into physical objects that can be experienced by others (Costin 2004:190).

All economic systems are composed of three elements: production, distribution and consumption. The goods found in an archaeological excavation give us an idea as to consumption patterns, but exchange events are invisible in the archaeological record. Production activities, in contrast, leave clear traces, such as refuse, debris, tools and other articles that are often more accessible to interpretation (Costin 1991:1).

Craft production is usually embedded within political, social and economic systems, and limited –or favored– by the conditions of the natural environment. According to Costin, certain aspects of production processes are indispensable to any understanding of the organization of production, such as (1) the distribution of raw materials; (2) the nature of technology; and, though to a lesser extent, (3) the training and skill of artisans (Costin 1991:2).

Craft production on a household level is of great interest to archaeologists because its presence indicates a certain level of economic interdependence among different sectors of society. Specialized production on

a small scale was an important component of most pre-modern domestic economies throughout the world, and most of the craft production took place in household contexts (Hirth 2009a:13).

Perspectives on craft production in the current archaeological literature are affected by two situations: first, our incomplete understanding of the way in which households operated and, second, our inability to generate economic concepts that would allow us to place craft production within the household economy. According to Hirth, part of the problem is the limited attention given to households in the ethnographic literature, which has resulted in an incomplete vision of domestic economies and of the strategies used by households to fully exploit their environment (Hirth 2009a:14). Hirth sees a paradox in archaeology in that while there is ample evidence for activities related to craft production on a household level in Mesoamerica and many other societies in antiquity, we lack a model to explain how or why this specialization came to exist. Of course, the main objective of households is to ensure their own survival and successful reproduction, so the key is to develop survival strategies that maximize productivity while minimizing risks, and this leads households to choose a mixture of subsistence activities to satisfy their needs (Hirth 2009a:23).

David Carballo suggests that households can be defined as groups of individuals linked by some notion of kinship and a shared identity who cooperate in the production and reproduction needed for survival. Households are thus social units that structure human behavior, but can also adapt and reconstitute themselves in order to meet their members' goals. Finally, they function as coordinated political actors that strategically negotiate their group's position within a social hierarchy (Carballo 2011:134).

During much of the pre-Hispanic sequence following the inception of sedentary societies in Mesoamerica, intensive household production was stimulated by economic symbiosis and market demand. Wealth in urban state capitals may have been more land-based, such that landless peasants turned to craft production for supplementary income. When urban elites and political institutions became involved in craft production, they were more likely to manipulate existing labor and tributary relations to their advantage than to implement radically new ones (Carballo 2011:144).

In Mesoamerica, much greater attention has focused on political economies at the expense of domestic ones, thus relegating the more common activities of household production to a secondary status in the archaeological literature (Carballo 2011:144). Despite this trend, there are examples of archaeological

research on household production, such as Michael Smith's excavations in several Late Postclassic (*ca.* A.D. 1300-1550) sites in the present-day state of Morelos in central Mexico. His projects have uncovered the remains of several households that were devoted to craft production, including cotton textiles, quartz tools, obsidian blades and jewelry, ceramic figurines, *amate* paper (and the stone bark-beaters used in its preparation), and decorated ceramic artifacts (Smith 2004: Table 2). Smith argues that these finds indicate that market systems were important institutions in the regional economy of Morelos in the Late Postclassic. In support of this, written sources from the early Colonial period mention markets of several sizes located in towns and even the smallest villages (Smith 2004:98). During the Postclassic period, trade and exchange systems extended throughout Central Mexico, incorporating the inhabitants of the sites studied by Smith into the Mesoamerican world system where even the poorest peasants had access to a plethora of exotic imported objects (Smith 2004:168).

In another area of Mesoamerica during the Classic period, households in Oaxaca were the focal point of the manufacture of goods destined for exchange. Households there were the foundation of the economic systems in all settlements. Feinman and Nicholas (2011) write that craft production and exchange took place in several households, so exercising direct control over these economic activities was virtually impossible. But those pre-Hispanic households in Oaxaca were not self-sufficient, so they manufactured a broad range of products for exchange with other domestic units. This exchange took place both inside communities and across wider contexts, ultimately covering extensive areas such as the Oaxaca Valley (Feinman and Nicholas 2011:46).

Moving to Central Mexico we see that, according to Linda Manzanilla's reports on Teotihuacan in the Classic period (*ca.* AD 200-750), there were four scales of craft production: (1) the apartment compound, where everyday needs were met; (2) extensive sectors on the city's periphery where craftspeople manufactured articles that urban-dwellers required; (3) barrio sectors supervised by noble 'houses' or kin groups; and, (4) specific crafts controlled by the rulers and produced in workshops housed in elite dwellings (Manzanilla 2009a:31). The urban-built environment in Teotihuacan included housing compounds in which craft activities were performed by highly-skilled specialists. Pottery production workshops, for instance, were located on the southern periphery of the city, presumably to take advantage of clay sources in the area (Manzanilla 2009a:31).

In her study of the Aztec state pertaining to the Late Postclassic period, Frances Berdan (2014) uses

ethnohistorical and archaeological information to discuss several aspects of the organization and sociopolitical context of craft production. According to this author, both ‘attached’ and ‘independent’ artisans existed among the Aztecs. The former were situated in, or near, palaces, so they may have had economic, social and political relationships with the elite. This applied primarily to certain luxury artisans who enjoyed the patronage of local rulers. Though these artisans may have been resettled in, or near, a palace, they maintained the household structure of production (Berdan 2014:108). Palaces have been defined as ‘complex residences that are used by the rulers of complex societies... palaces... are private residences’, but they played a public role in ancient Mesoamerica and the Andean area (Pillsbury and Evans 2004:1). Archaeological attention on this topic has increased considerably in recent times, yet we still ask ourselves just what activities were conducted in palaces, and what the artifactual remains of such activities would be (Pillsbury and Evans 2004:2). The subject of palaces as sites for craft production has been addressed by Michael Smith, who holds that ‘most urban residents had to provide goods or labor service to the [local] palace. This was organized on a rotating basis; when it was a family’s turn, its members went to the palace to run errands or do other tasks’ (Smith 2016:213). In contrast, some independent artisans who produced both luxury and utilitarian goods were concentrated in specific neighborhoods. They enjoyed a certain

economic exclusiveness and social cohesion, much like the craft guilds of Medieval Europe (Berdan 2014:109).

Artifacts made of jade played an important role in the Mesoamerican economy and functioned as status symbols and ritual paraphernalia. Recent research in the Maya area has shown that the production of jade objects (among many others) often took place in a variety of domestic and non-domestic, as well as elite (Aoyama 2007) and commoner contexts (Rochette 2014). Some workshops probably exported jade preforms to production sites, which then worked them following their own lapidary traditions. Those products likely circulated in different contexts of exchange, and each type of object may have had a different value. Exchanging a finished jade object, a block of unworked material, or a preform, did not imply the same obligation between the actors in the exchange as the gifting of a pendant or some other finished product. Differences of this kind illustrate the complexities of wealth and commodity exchange systems (Andrieu *et al.* 2014).

The foregoing discussion will help the reader understand the possibilities and challenges related to the reconstruction of household production activities, and how the ethnoarchaeological information presented in the following chapters may help us bridge the gap between past and present domestic contexts and activities.