The spatial organisation of pottery production in Huáncito, Michoacán, Mexico

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Introduction

The analysis of spatial organization has attracted a large number of researchers to the study of the internal structure of archaeological sites. However, in the specific case of ceramic production in the Prehispanic period, we have very little data dealing with the spatial organization of domestic pottery-producing units. This situation is due to the paucity of extensive excavations of potting compounds; such information is particularly lacking in Western Mexico.

This paper contributes to the study of the organization of space in pottery-producing households from an ethnoarchaeological perspective. The ethnoarchaeological approach is based on the observation of contemporary cultural patterns to provide data and inferences to help in the interpretation of the archaeological record.

Ethnoarchaeology and activity areas

The concept of the 'activity area' has gained great popularity in archaeological literature since its first appearance. According to Flannery and Winter (1976: 34), an activity area is a spatially restricted area where a specific task or set of related tasks have been carried out. It is generally characterized by an accumulation of tools, waste products, and/or raw materials. In some cases, even when it has not been possible to identify activity areas, archaeologists in Mesoamerica have recognized 'activity sets', or tool kits used for the performance of a specific task.

For Flannery (1976: 5) the smallest unit of analysis in the Prehispanic village is the activity area, with features such as hearths or storage pits being equally small. At the next level of complexity can be added those portions of the house floor, frequently composed of several features or activity areas, that form the masculine and feminine work areas within the house. The next unit of analysis is the house itself, to which can be added the household cluster (the house and all features - storage pits, burials, refuse concentrations, and others - found in its immediate surroundings which can be reliably associated with the same house). According to Manzanilla (1986: 9), 'the activity area is the basic unit of analysis of the archaeological record, because it is a reflection of particular and repetitive actions, social in character, and with a specific functional background'.

The concept of activity area in archaeology has, however, received ample criticism in recent years. According to O'Connell (1987: 74), the analysis and interpretation of this type of patterning in the archaeological record has been based on three main assumptions:

1) that activities are spatially segregated, that is, each activity or closely related set of activities is restricted to its own space or set of spaces within a site;

2) that activities typically produce characteristic co-variant sets of artefacts and other refuse in proportion to the frequency of performance;

3) that artefacts and other refuse associated with a particular activity are deposited at or very near the place of performance.

Such arguments have been seriously challenged in recent years, especially by ethnoarchaeologists, who have shown that:

1) different activities are often performed at the same place, and the same activities at different places within a site, depending on such factors as task-group composition, the number and nature of activities simultaneously in progress, prevailing weather conditions, and the distribution of shade and shelter;

2) activities do not necessarily produce co-variant sets of artefacts in proportion to the frequency of performance;

3) refuse produced by a specific activity need not necessarily be deposited at the point of production, but may often be sorted by some parameter unrelated to the activity that produced it and differentially removed to another location for disposal (O'Connell 1987: 74).

The relationship between cultural behaviour and its reflection in the archaeological record is more complex than many archaeologists have imagined. On the other hand, the spatial organization of behaviour is systematic, and should therefore be represented systematically in the archaeological record (O'Connell 1987: 75).

This paper deals with the organization of domestic space in potting compounds in Huáncito, Michoacán, Mexico, a modern Tarascan Indian community (Fig. 1). For a description of the site and study area, see Williams (1994a).

Potting activities in their spatial context

Most of the pottery-producing households in Huáncito share the same portable and fixed elements linked with ceramic manufacture. These are, among others, a 'work table', consisting of a wooden plank *c.* 30 x 50cm placed either at floor level or at a height of *c.* 50cm; a variable number of concave and convex moulds; objects used for polishing the clay vessels, such as rags and fragments of plastic; brushes and paint; kilns for firing the vessels; and areas for drying and storing pots. The author spent several months regularly visiting the potting compounds on which the present study is based. Two compounds are illustrated (Figs 2 and 3). Data were collected through direct observation of activities as they were being conducted in several parts of the houses, and by interviews with the potters in Huáncito and neighbouring communities. The following is a brief description of each step in the manufacture of ceramic vessels, with special emphasis in each on its spatial organization.

1) Clay extraction and grinding - clay deposits in Huáncito are located on the outskirts of the village. The extraction of clay over many years has produced deep pits and tunnels. Close to the site where the clay is found, there is an area of approximately $10m^2$ where the clay is ground, using large rocks kept there. After grinding, the clay is left to dry in the same spot near the clay pits. Clay grinding may also be done in the potter's house or in one of the mills that operate in Huáncito. In the former case either rocks, *metates* (grinding stones, similar to those used in maize preparation), or other similar tools may be used.

2) Paste preparation - this part of the ceramic process involves adding water to pulverized clay, producing a malleable substance that is kneaded until it is shaped like a ball *c.* 40cm in diameter. This activity may be conducted in the open, for example on the patio (under the shade of trees), or inside the house. A plastic sheet is generally used to avoid contact of the paste with the floor. The balls of clay can be stored for later use.

3) Moulding - once the paste is ready, moulds are used to give it the desired

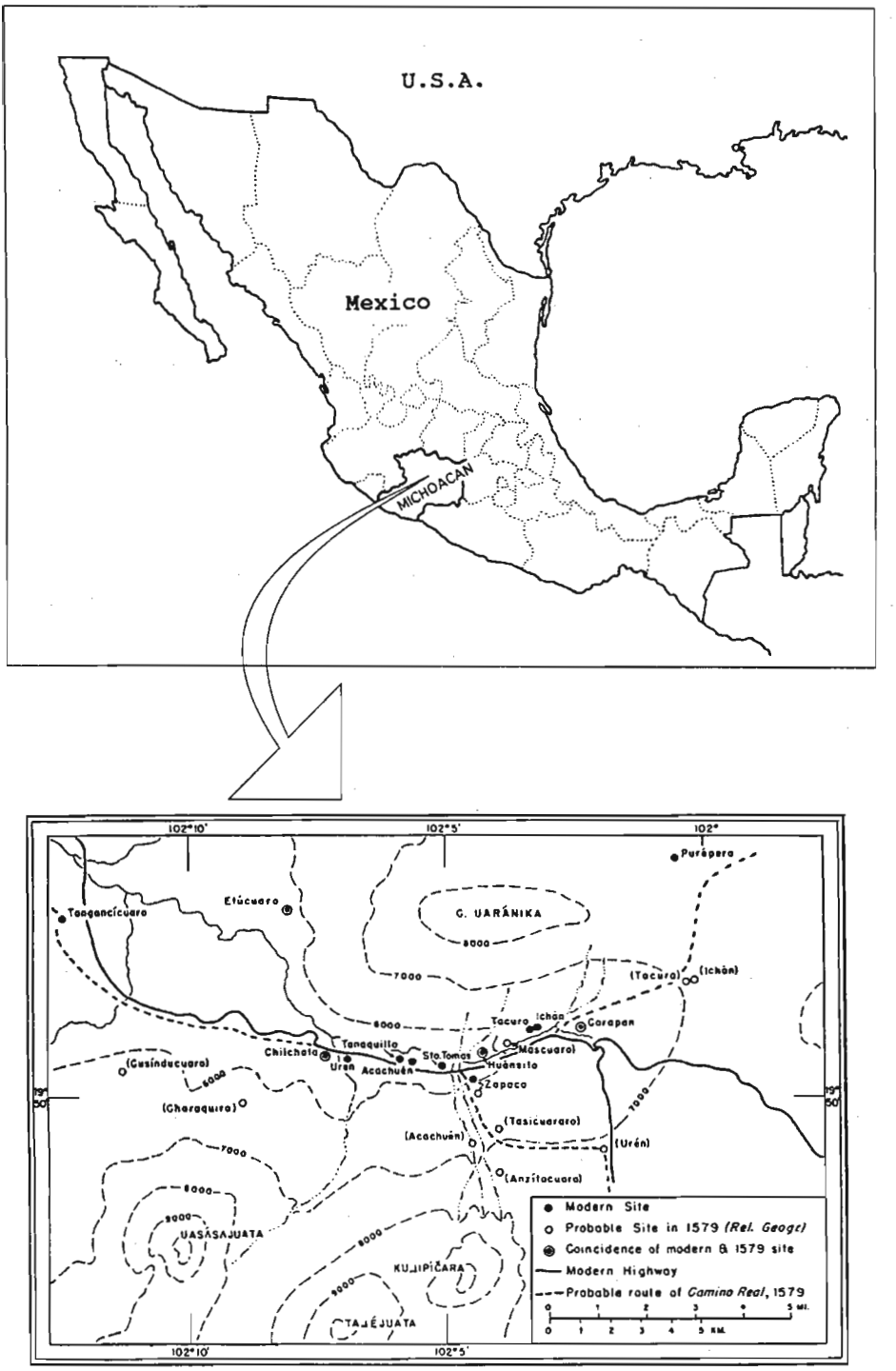

Figure 1 Map of the study area

shape. This activity is normally conducted on the work table, making a flat clay 'pancake', cutting it down to the desired size and introducing it into the mould. The work table is covered with a thin layer of finely ground earth, so that the moist clay will not stick to its surface. Two types of mould are currently used in Huáncito, concave moulds of two vertical halves, used to make water jugs and cooking pots; and convex moulds, used to make pans and *comales* (griddles). These moulds are kept in several places around the house, not necessarily near the places where they are used.

4) Smoothing, polishing and burnishing the clay - once it has been removed from the mould, the newly formed vessel is smoothed with a piece of moist cloth, thus erasing almost completely the marks left by the mould as well as any other imperfections visible on the surface, which is still fresh and relatively malleable. After this, the pigment locally known as *charanda* (red earth) is applied with a brush and polished with a small plastic object until it acquires a characteristic sheen (pots were formerly polished with small, fine-grained river cobbles). Pots painted with natural earth colours are burnished prior to firing in the kiln, whereas industrial paints are applied after firing, and do not require burnishing. These activities may be conducted in practically any part of the house, for example on the patio, in the shade of a tree, or inside one of the rooms (see Figs. 2 and 3). Sometimes smoothing and polishing, which require less attention than painting, are performed while the potters are watching television in one of the rooms.

5) Drying - vessels are left to dry in a room, which may be used exclusively for that function, or in one of the bedrooms. Sometimes the space for sleeping in the bedroom is minimal, because it is filled with drying pots, or with finished pots waiting to be sold. Before firing in the kiln the pots are further dried in the sun, usually on the patio. In this case a section of the patio is used where traffic is less intense to avoid accidental breakage.

6) Firing - pottery firing in Huáncito is conducted in the kilns found in all potting compounds. Firewood is frequently stored in the house in large quantities, or is procured just before a batch is fired. When firewood is moist or green it is put to dry in the sun. The kiln is covered by fragments of pottery (wasters) prior to firing, which are always kept in a pile near the kiln.

7) Painting - this is one of the activities with fewer restrictions regarding its location within the house. The place where it is performed depends on variables such as weather and shade, with other activities being conducted simultaneously. When the weather is dry, painting takes place on the patio, under the shade of a tree; but it is also common to conduct this activity inside the house.

8) Refuse disposal - although potters in Huáncito are experienced, and technical problems while firing the pots are rare, some vessels occasionally break or have some blemish or firing defect (e.g., pots with thin walls, smoke stains, ill-formed shapes, etc.). Despite this misfired pieces or fragments of pottery do not accumulate within the potting compounds. Those pieces not too severely affected may be sold as 'second class' merchandise, or are recycled for domestic use in the potter's house. Useless vessels are disposed of in two places on the outskirts of town: on the margins of a river, and in the bottom of a gully. Great concentrations of broken pottery can be seen in these places.

Archaeological implications

Archaeological markers

In order to be able to understand how the different activities linked with the ceramic

manufacturing process were spatially organized in the prehispanic past, it is necessary to be able to recognize not only the implements used by the potter in the various stages of his or her work, but also the raw materials; and the locales of production, of firing and of storage of implements and raw materials (Deal 1988: 113). However, there are two basic problems for the realisation of this analytical goal. Firstly, most of the tools and implements used in the Prehispanic period for pottery manufacture, such as tree branches, corncobs, *maguey* fibres and textiles were perishable, and are rarely preserved in the archaeological record. Secondly, many of those implements that are preserved in the archaeological record are not easily recognizable as potter's tools, such as stone polishers, shells, grindstones, and rocks used to pulverize clay (Williams 1994b).

The fact that not all activities in the ceramic production process have the same degree of archaeological visibility must be taken into account by the archaeologist. For example, the extraction of clay can be done with tools as simple as sticks and baskets or sacks when the clay deposit is on the surface, or it may require picks and shovels when it is at some depth, as in the case of Huáncito.

Clay grinding was traditionally carried out with large rocks or with *metates*, and this technique still survives in a few households in Huáncito. Although in some cases this activity can leave some archaeological trace, as in the grinding of calcite for temper (Deal 1988: 117), usually the tools used for grinding the clay are indistinguishable from those used for food preparation.

The kneading of the clay into a paste is an activity that is conducted without using any kind of implement, so its level of archaeological visibility is nil. Not so the moulding of the vessels, because moulds are quite abundant in pottery-producing houses, and being made of ceramics their chance of preservation and incorporation into the archaeological record is high. Ceramic moulds are treated with great care in Huáncito, sometimes being repaired when they break. According to the information given by some potters, it is not rare to have moulds with more than ten or 20 years of continuous use.

The activities of smoothing, polishing and burnishing are currently carried out in Huáncito using implements such as pieces of cloth, small objects of plastic or glass, etc. In the Prehispanic period small stones were probably used as polishers, and they are still being used in some areas, such as the Chiapas Highlands of southern Mexico (Deal 1988). Just like the polishing of pots, painting is an activity with low archaeological visibility, because implements such as brushes are not preserved in the archaeological record. On the other hand, some mineral colorants may be preserved and might be recognized in an archaeological excavation.

Of all the activities linked with the manufacture of ceramic artefacts, firing pots in the kiln may be the one most obviously represented in the archaeological record. At least in the case of Huáncito, the kilns always occupy an important place inside the compounds, usually on the patio. Apart from the firing structure itself, which is quite conspicuous, other features or refuse materials that are linked with this stage of the ceramic process and that could be identified archaeologically with relative ease are the saggars, or fragments of pottery used to protect the pots from flames and gases during firing, and the wasters or potsherds used to cover the kiln's mouth during firing.

In summary, the material evidence of ceramic production in Huáncito that is most likely be preserved and enter the archaeological record consists of moulds, the kiln with associated ceramic fragments, and finished or semifinished vessels stored in the

potter's house (the latter would appear in quantities far surpassing the typical requirements of a family). All the other implements or tools would be expected to enter the archaeological record infrequently because of their perishable nature, or would not be easily identified with ceramic production, being unmodified or unspecialised objects.

Spatial organization

The data presented by Arnold (1991: 100-1) derived from pottery-producing communities

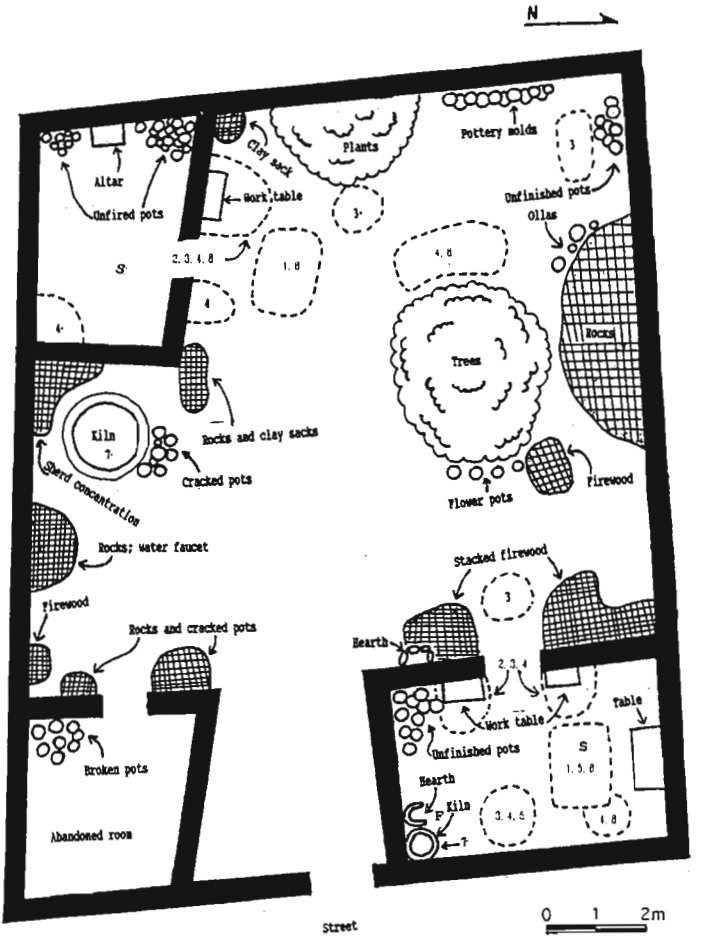

Figure 2 Potting compound A, showing major elements, activities and work locations
Key: 1. Paste preparation; 2. Moulding; 3. Smoothing; 4. Polishing; 5. Burnishing; 6. Drying; 7. Firing; 8. Painting; S. Sleeping area; F. Area of food preparation and consumption

in Los Tuxtlas, Veracruz, Mexico, are to some extent applicable to the case of Huáncito. According to Arnold, ceramic production can be organized either as a flexible activity, or as an activity with a more rigid and restricted structure. This can be seen as a continuum of production activities, with spatially flexible tasks at one extreme and spatially

restricted ones at the other. Spatially flexible activities are those that are not confined to a specific locality, but rather can be moved from one place to another as space becomes available. The elastic nature of these activities usually means that they are finished relatively quickly, and produce refuse materials that are small and of low quantity.

For the realization of spatially flexible tasks, tools and techniques are chosen which do not impede their possible spatial relocation. Artefacts associated with this type of activity include polishing stones, small moulds, and cutting implements. These tools

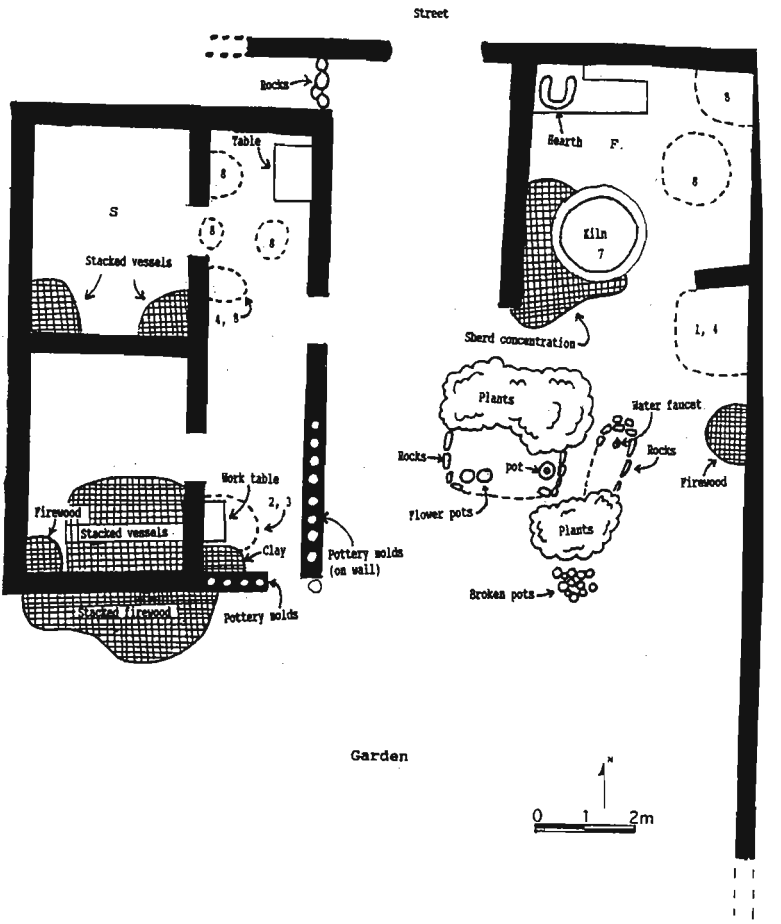

Figure 3 Potting compound B, showing major elements, activities and work locations
Key: As for Figure 2

can be used anywhere and can be easily moved in response to changing conditions in the use of space (for example, sunlight, wind direction, or the location of children).

Spatially restricted activities are associated with a material technology which is different from the one previously described. These tasks must be undertaken in a

specific place, because they depend on a fixed element, such as the potter's kiln. In comparison with the flexible activities, restricted ones usually take longer to complete, and produce bigger and more abundant residues. Other factors that may influence the organization of production are as follows: the availability of space for production activities, the size of the workforce, and the sequence of production tasks (Arnold 1991: 102).

According to Sugiura and Serra (1990: 212), there are several levels of intensity of ceramic production. The lowest one is the individual level, in which pottery is produced merely to fulfil the domestic needs of the potter. In potting households pertaining to this level of complexity, activity areas linked with pottery manufacture are neither fixed nor well defined. Space is multifunctional, and the locale for certain activities, such as moulding, can be changed according to the season of the year or to other variables. The use of space in this level of production is characteristically dispersed and overlapping, as space continues to function for different purposes simultaneously; and may be used for many tasks that are not linked to pottery production, such as maize processing.

In all of the potting compounds that the author has observed in Huáncito, the majority of activities linked with ceramic production can be defined as flexible in terms of the use of space. The exceptions are those carried out on the work table or in the kiln. Likewise, time is organised in a very elastic way. Although there is a certain order in which things have to be done (for example, clay has to be extracted first, then it has to be ground, the red pigment has to be applied before firing, and so on), many aspects of production depend on factors that are totally beyond the control of the potter, such as the weather. If appropriate conditions are absent, the potter simply postpones an activity, such as firing, until another day.

Conclusions

Pottery-producing domestic units in Huáncito can be defined as specialized workshops, because their production is far greater than the requirements of the household, and is intended primarily for trade. This level of production probably existed in parts of prehispanic Mesoamerica, such as the Basin of Mexico (Rattray 1990: 184).

Although spatial organization in the potting compounds visited by the author in Huáncito shows certain regular, recurring patterns, its analysis in terms of the concept of 'activity areas', as this has been formulated by several authors, is faced with serious problems. Most activities are not carried out in spatially restricted areas, and are not characterized by the *in situ* accumulation of tools, refuse or raw materials. The different tasks linked with pottery production are not always carried out in the same place, and distinct activities (some not linked with ceramic manufacture) can be undertaken in the same location within the compound.

According to Sugiura and Serra (1990: 208) studies dealing with activity-area research frequently lack objectives beyond the mere archaeological identification of activity areas and the description of their probable function. Although many archaeological studies are based on the assumption that analysed artefacts were deposited as primary refuse, this type of refuse is produced only under certain limited conditions (Schiffer 1988: 472; see also Hayden and Cannon 1983). This has been confirmed in Huáncito, where daily cleaning activities in the potting compounds (primarily sweeping the floor of the rooms and the patio) erase most of the traces produced by pottery manufacturing activities.

In the case of ceramic production in preindustrial contexts, one of the problems with the definition of activity areas is that most of the tools of production are small, and may be reused or transported to other places, instead of being discarded in the place where they were used (Stark 1984: 12). Archaeological visibility is also affected by the fact that not all activities are consistently carried out in the same place. Obviously, the more one place is used for the same activity throughout the occupation of a site, the more likely it would be to contain traces of that activity recognisable by the archaeologist (Deal 1988: 113).

The data presented in this paper seem to indicate that in the analysed compounds space is not divided into specific activity areas, and that refuse materials are not deposited in primary contexts, i.e., at or near the place where a certain activity was carried out. The concept of activity area as proposed by archaeologists does not always take into account the ease with which some activities may be carried out in one or another place within the household, or are initiated in one place and finished in another.

This paper has demonstrated how ethnoarchaeological observation can produce an integral vision of all the activities that are carried out in a house - not only those linked with the ceramic process - helping an understanding both of the structuring of spatial contexts, and the organization of work, within pottery-producing households. This information can then be used as a model for archaeological interpretation.

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