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The organization of pottery production at Tell Chuera: a technological approach

Taos Babour

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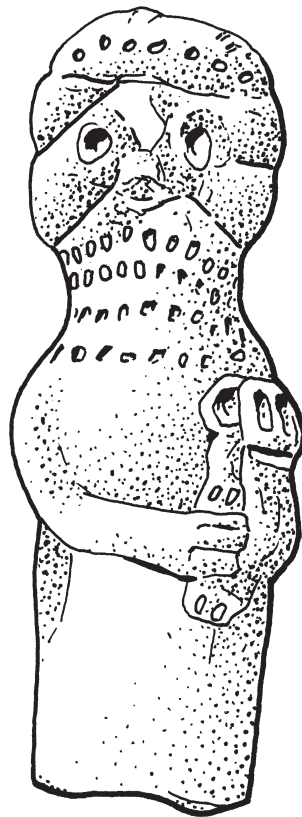
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House and Household Economies in 3rd Millennium B.C.E. Syro-Mesopotamia

Edited by

Federico Buccellati
Tobias Helms
Alexander Tamm



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The organization of pottery production at Tell Chuera: a technological approach

Taos Babour, Paris

In north-Mesopotamian archaeological pottery studies, researchers often refer to ‘household’ production in opposition to ‘specialized’ or ‘workshop’ production (e.g. Pflanzner 1996, 2001; Wattenmaker 1994, 1998; Stein and Blackman 1993: 31; Eiland 2003). This distinction comes from D. P. S. Peacock’s model, developed to classify Roman pottery production (Peacock 1982: 6-11). He writes, using a restricted definition of ‘household’, that “households are essentially consumers of goods, but they may undertake production for their own benefit. In a household production, each household makes pottery for its own consumption”. Peacock specified that hand-made pottery was not necessarily produced by household production, but he nevertheless preferred a linear evolution of complex technology following economic expansion. This form of typology implies some confusion between craft specialization (the potter’s skills and know-how) and economic specialization. Consequently, hand-made and open-fired potteries are often understood as non-specialized household productions, whereas wheel-made and kiln-fired potteries are seen as workshop specialized productions.

This theoretical correlation between ‘technical’ and ‘economic’ specializations was later redefined by C. L. Costin, who pointed out the distinction between production and specialization. According to her definition production is the transformation of raw material or components into usable objects, and specialization is the way of organizing the production. Craft specialization is a dynamic combination of different factors, i.e. technology, standardization, output, context of production, etc. However producers depend, partly at least, on an extra-household relationship for their livelihoods. Consumers depend on them for the acquisition of goods they do not produce themselves (Costin 1991: 3-4).

Some studies, for example at Tell Leilan or Kurban Höyük, have already demonstrated that the dynamic aspect of craft specialization may modify the whole organization of pottery production, as well as the distribution at a site or in a region (Blackman, Stein and Vandiver 1993; Stein and Blackman 1993; Wattenmaker 1998). The technological study of material from the Tell Chuera local chronological phase IC period also reflects the possible diversity of contemporary specialized productions. Our technological approach strengthens the hypothesis that the pottery production of mid-third-millennium northern Mesopotamia was

characterized by a large number of independent specialists (Stein and Blackman 1993). However, it also appears that the degree of standardization and specialization of these productions must be looked at as relative. Finally, these observations are an opportunity to re-evaluate the productions that used to be defined as ‘non-specialized’.

Pottery production evidence at Tell Chuera

At Tell Chuera there is some direct evidence of pottery production. A huge quantity of sherds has been found all over the site. None of these had the distinctive holes (for repairs), as is sometimes the case at consumption sites. More importantly, different kinds of wasters and a kiln dating from the local chronological phase TCH ID period have been found in the eastern lower town (Helms forthcoming; Tamm forthcoming). The drainage system, as well as raw clay, pits, hollows in the floor and many multifunctional tools, such as mortars and pestles, suggest that the sector was probably a large production area. Because of the similarities of structures with residential areas, T. Helms interpreted the W1 units as “a dwelling area in a pottery production environment”. He also suggested that there was evidence of complementary activities such as seasonal harvest work, and possibly spinning functions (Helms forthcoming). As far as we know, the production units seem to have been brought together even though two other pottery workshops from the next period (TCH IE) were found on the opposite side of the Tell, west of the upper town (Moortgat and Moortgat-Correns 1978; Orthmann and Pruss 1995: 124-125).

Unfortunately, only one type of pottery is represented in the wasters. These are always small open vessels, shaped by wheel-coiling technique. Their forms mark respectively the ID and IE periods in consuming units dispersed over the site (Orthmann 1995: 43; Klein and Orthmann 1995: 81; Orthmann and Pruss 1995: 135). However, ID bowls were often found together with many other types of vessels already known in the previous IC period. Even if no workshop from this period was excavated, the study of a pottery collection can give us information on the different wares and their production process.

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Sampling and methodology

This collection comes from area B, located in the upper town of Tell Chuera, north of the main ‘street’, between ‘stone building 1’ and ‘stone building 3’ (Fig. 1). A sample of 1732 sherds and complete vessels from primary and secondary contexts was selected from amongst the pottery found in the storage and grinding process buildings excavated in this area. These buildings are located north-east of the earlier ‘stone building 2’ (Klein and Orthmann 1995; Meyer, Neef and Weninger 2010).

A technological study of the whole production process (including raw material access and preparation, shaping methods and techniques, finishing, drying and firing) was added to the more traditional morphological study. This study was based on ethnological and ethno-archaeological experimental references, more particularly for the observation of surface features revealing the fashioning *chaîne opératoire* (Van der Leeuw 1976; Rye 1981; Roux 1994; Courty and Roux 1995, 1997; Roux and Courty 1998; Gelbert 1994, 2003, 2005; Livingstone-Smith 2007; Dupont-Delaleuf 2010, 2011). According to V. Roux, this *chaîne opératoire* can be described in terms of both organization of the fashioning sequence and techniques used to perform the sequence. The latter includes

three stages, which are primary forming (or roughing-out), shaping and finishing or surface treatments. A technique is defined by the physical parameters in which raw material is transformed, as characterized by three factors: energy source (finger pressure with or without rotary kinetic energy), type of pressure (continuous or discontinuous) and homogeneity or heterogeneity of the clay mass used (Roux 1994: 46-47).

607 sherds from the sample showed surface markings, but only 40% of these markings were unambiguous and could be clearly interpreted in terms of fashioning techniques. However 5 different fashioning sequences could be identified (Figs. 2 & 3). These data were then compared with the groups of materials and the morphological types of vessels.

‘Common ware’

The so-called ‘common ware’ includes in fact a great variety of materials. Macroscopic sub-groups were made depending on the forms, sizes, colors, quantities and sorting of inclusions in the ceramic material. X-ray fluorescence analysis showed both the non-relevance of the macroscopic groups and their compatibility with the local



Fig. 1 Geomagnetics of Tell Chuera and overview of Areas A, B and D (Area B encircled).

soils.¹ Petrographic analysis still remains to be performed but we can assume that potters used different clay sources and different recipes for the preparation of raw material.

These recipes seem to have been used indistinctly with the different shaping techniques. The finest kind of material (probably sieved or levigated) was, however, preferably used with the wheel-coiling technique. Conversely, natural

clay and mineral or straw tempered materials were often used for those vessels shaped without the help of rotary kinetic energy. (Fig. 4)

A large part of the so-called ‘standard or ‘common ware’ material was shaped by wheel-coiling. This shaping tech-

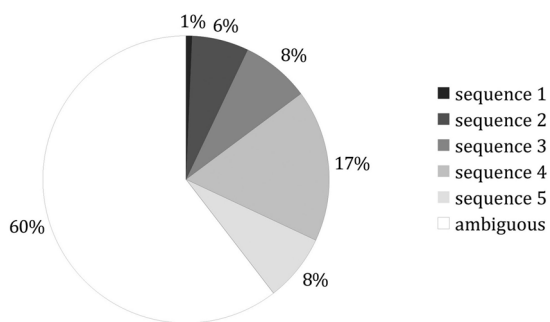


Fig. 2 Surface features and sequences.



Fig. 4 Fashioning sequences and morphology of the "common ware".

PRIMARY FORMING	SHAPING	FINISHING	SEQUENCE
coiling	joining, thinning the coils with continuous pressure of the fingers thanks to the help of rotary kinetic energy : "wheel-coiling "	wheel shaving and smoothing	5
		hand scraping and wheel smoothing	4
	joining and thinning the coils with discontinuous pressure of the fingers : "coiling"	burnishing	3
		hand scraping and smoothing	2
modelling	distontinuous pressure of the fingers on a homogeneous clay mass	none	1

TECHNIQUES

Fig. 3 Fashioning sequences noticed on the area B assemblage.

¹ The results of X-ray fluorescence analysis mentioned in this article will be presented and discussed in detail in the PhD thesis I am currently preparing.

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nique seems to have been mainly used for small vessels such as bowls and small jars (less than 30cm high). On the contrary, the oldest method using coiling technique without rotation was still primarily used for jars and open pots. The many surface features left on the vessels however show that the use of the wheel-coiling technique was not always mastered. (Fig. 5)

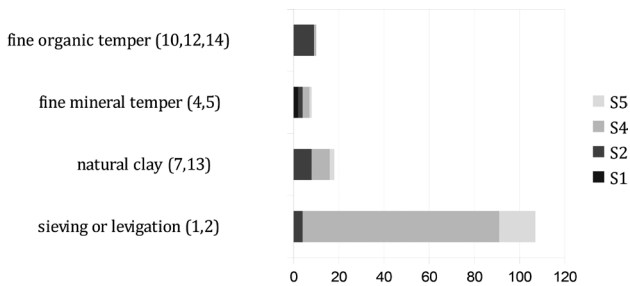


Fig. 5 Fashioning sequences and material varieties of the "common ware".

Ethno-archaeological studies demonstrate that the wheel-throwing technique needs specific motor abilities, the acquisition of which is a long and progressive process. Consequently the use of rotary kinetic energy is reliable evidence of craft specialization. Furthermore the dimensions of the vessels shaped with this technique can reflect different stages of apprenticeship: open and small vessels are easier to shape than closed and large vessels (Roux and Corbetta 1990).

In our assemblage, the correlation between different kinds of materials, fashioning sequences and morphological types perfectly illustrates the intermediate stage of the potters' craft specialization during the TCH IC period. The common ware vessels were probably produced by several individuals, or groups of potters, who shared the same know-how. However, all of them might not have mastered the wheel-coiling technique well enough to produce all the morphological types of vessel; they may also have tried to adapt the workability of the materials to the new shaping technique.

'Cooking-pot ware'

The frequency rate of the so-called 'cooking-pot ware' within the assemblage is only 5%. It is interesting to note that the amounts of some isolated material varieties of common ware forms are often not greater than 5%. This group appears however more homogeneous than the common ware. It differs in all aspects: the preparation of the material, the fashioning sequence and the morphology.

These vessels are fashioned with a coarse, crushed calcite-tempered material. As with all the macroscopic sub-groups of common ware from Tell Chuera, the X-ray fluorescence analysis revealed no correlation between the chemical composition of the sherds and the cooking-pot ware macroscopic group. Their global composition differs very little from the common ware and is also compatible with the local geology. The cooking vessels are shaped using the coiling technique, but their surface treatment differs from those common ware forms shaped without the help of rotary kinetic energy, as they are burnished (Fig. 2). The forms of this production are primarily cooking-pots. These are round-based, globular pots with triangular lugs, or rims stretched to the exterior. The occasional presence of other morphological and functional types, such as cups and big bowls, suggests that this technical group was not always reserved for cooking-pots. (Figs. 6 & 7)

The typical form of cooking-pots, globular with triangular legs at the rims, appeared in the region at the end of Tell Chuera IB, and remained part of the assemblages at least until the end of the ID period (Hempelmann 2013). They are also characteristic of period IV from Kurban Höyük (Algaze 1990, Wattenmaker 1998) in Anatolia, and of periods EJZ III and IV in the Khabur region (Rova 2011; Oates 2001). The same open forms found at Tell Chuera also appeared at Kurban (Algaze 1990: 329, pl. 92), Tell Atij' and Tell Gudeda (Boileau 2005: 46), as well as at Tell Brak (Oates 2001: 1668, 1669 fig. 465; 1679, 1680 fig. 466). Two different interpretations were proposed in relation to this production. Both admit that the differences between the production processes imply the presence of different social groups of potters: but were the cooking vessels produced by non-specialized households (Wattenmaker 1998) or by specialized potters (Boileau 2005)?

Discussion

The use of the wheel was the main criterion P. Wattenmaker used to define the degree of technology. As compared to the fine common ware and given the low degrees of both technology and standardization, she assumed that the hand-made cooking-pots of Kurban Höyük were produced by non-specialists (Wattenmaker 1998). The observation of common ware from Tell Chuera suggests that in the IC period both coiled and wheel-coiled pottery were produced by the same potters. One must be cautious, then, when defining a production as non-specialized because their vessels are used without the assistance of rotary kinetic energy.

From a technological and practical point of view, the use of crushed calcite as temper is well known for providing a vessel with thermal-shock resistance (Bronitsky and Hammer 1986; Tite and Kilikoglou 2002). Furthermore, when burnishing is performed well, it can give some impermeability to the vessel (Echallier 1984: 18).

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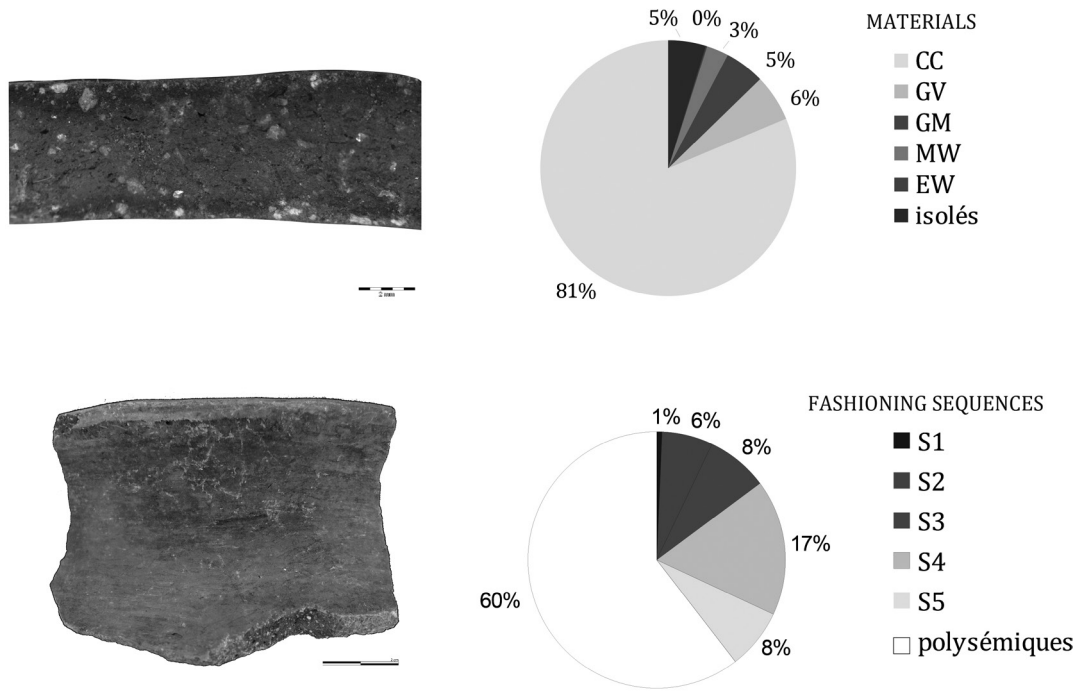


Fig. 6 Technology of the "cooking-pot ware".

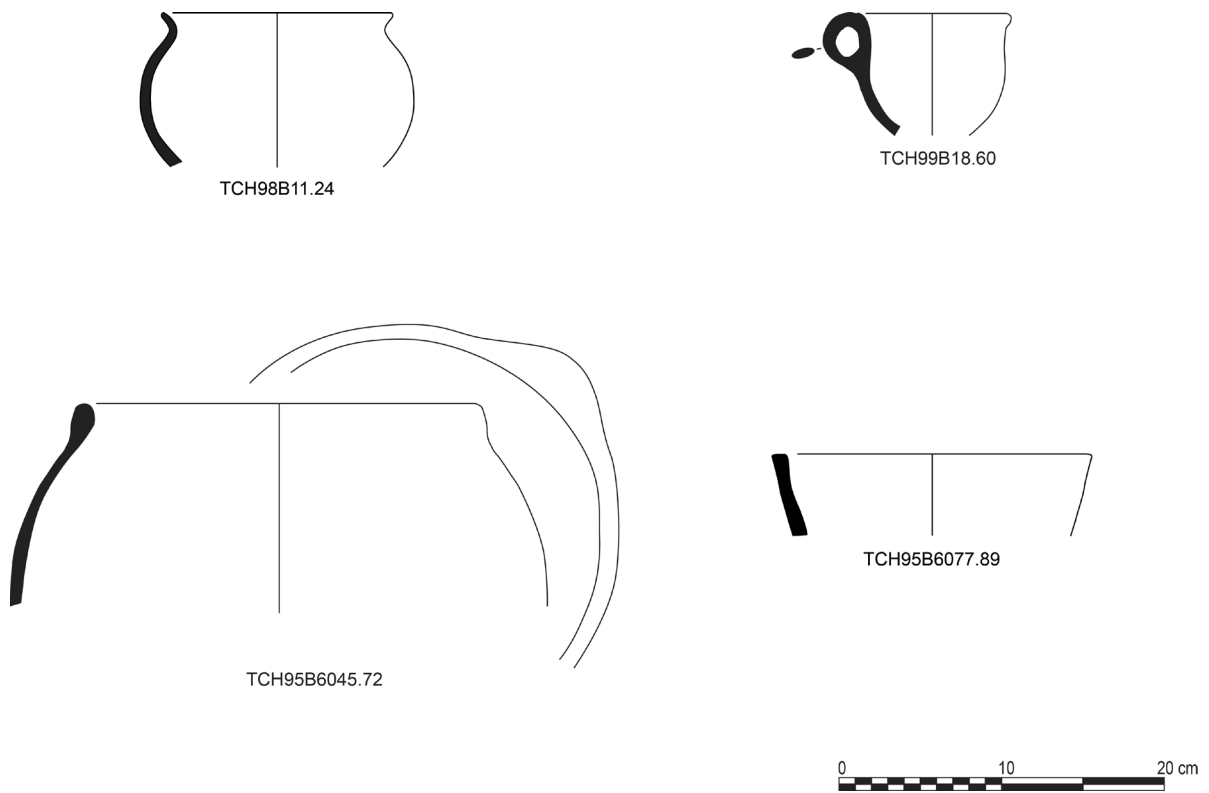


Fig. 7 Vessel's forms of the cooking-pot production (noticed in the area B pottery collection).

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Crushed calcite temper and burnishing were known in the region since the mid-sixth millennium (Le Mière and Picon 1994), but that does not imply they were practiced in each household. Due to these techniques, the production process of cooking-pot ware needed greater investment of time than that required for jars, pots and all common wares of Tell Chuera made using a coiling technique. In addition, crushed calcite temper material seems inadequate and indeed potentially harmful to fingers if formed using rotary kinetic energy.

At Tell Bi'a (Schneider and Daszkiewicz 2002), as at many sites in the Khabur region, such as Tell Beydar (Broekmans, Adriaens and Pantos 2004), Rad Shaqra (Daszkiewicz and Bobryk 1998), Tell Atij' and Tell Gudeda (Boileau 2005), the analyses revealed the presence of three distinct types of cooking-pot material. The first is tempered with crushed calcite, as at Tell Chuera, Kurban or Lidar Höyük; the second is tempered with basalt. At Tell Beydar, an 'intermediate' type is tempered with both calcite and basalt (Rova 2011: 74). According to Schneider and Daszkiewicz, basalt should be more effective than calcite in terms of the resistance of the vessel (Schneider and Daszkiewicz 2002). However, the technical study of the manufacturing process undertaken by M. C. Boileau at Tell Atij' and Tell Gudeda revealed that calcite- and basalt-tempered vessels, which look very similar to our IC/ID cooking-pots, were carefully worked and better finished than other groups of cooking-pots. As the raw materials used for basalt-tempered pottery came from the Ard esh-Sheikh region, about 30km to the north-west, she presumed that these finer vessels could have been made by specialized itinerant potters, whereas the poorly worked cooking-pots, shaped with five different kinds of fabrics, could have been a local, non-specialized production (Boileau 2005).²

At Lidar Höyük, the analysis demonstrated the use of different clay-materials to produce cooking-pots and common or fine vessels from the pottery center found next to the settlement. Both were compatible with local soils however (Klenk 1987). Even if the chemical composition of the sherds is compatible with the geology of the sites, it does not prove that the vessels and the raw material used for tempering might not have been imported from elsewhere, since the geological profiles of different sites can be similar. However the geochemical compositions of the cooking vessels from Lidar and Chuera do not seem to correspond.

The technological know-how and time-investment in the production, as well as their discovery in different kinds of context and the broad distribution of the 'cooking-pot' ware, may be evidence for a specialized production. The frequency rate of morphological types indicates that this

kind of production was particularly appreciated for its highly efficient cooking-pots. Until now, no production site specific to cooking vessels has been excavated. It is therefore difficult to gather precise information about the organization of this production. As M. C. Boileau has suggested, itinerant potters could well have existed. It is also possible that individuals, or small groups of potters sharing the same skills, could have lived at the different sites, as often seems to be the case from the common ware found. Further specific studies, comparing geo-chemical and petrographic characteristics, as well as fashioning methods and processes of mid-third-millennium, north-Mesopotamian cooking-vessels found at the different sites, could help us to identify their production and diffusion networks.

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² This study does not seem to take into account the stratigraphic distribution of the 3rd-millennium material, and it would be interesting to specify if these productions were contemporary (as is currently implied), or if there were some chronological differences in their apparition and evolution sequences.

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