



CHALCOLITHIC CERAMICS FROM LOGARDAN TRENCH D AND GIRDI QALA NORTHERN MOUND: TECHNICAL FEATURES

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As in the 2015 campaign, the analysis of the chalcolithic ceramics from Girdi Qala and Logardan implied a technical approach to all the passages of the *chaîne opératoire*. The classificatory investigation of the sherds encompasses all the stages of the manufacturing process and highlights different traditions corresponding to different groups of producers, in accordance with a methodology already employed (Roux and Courty 2005, 2007; Baldi 2013b) for Levantine and north-Mesopotamian chalcolithic assemblages (Baldi 2012a, 2012b, 2012c, 2012d, 2013a; Baldi and Roux 2016). The technological reading of the surface features aims at characterizing the fashioning and finishing operations, while petrographic examinations allow detecting raw materials and the treatments to which they have been subjected during manufacture. It implies to take into account both surface features and micro-fabrics and to call upon ethnographic and experimental data. Given the often-polysemic character of the technical attributes, it is crucial to combine different scales and methods of investigation, both an autoptic and naked-eye analysis and a microscopic one. The result is a synoptic view of the different *chaînes opératoires* present in the assemblage, as well as of the finished products the *chaînes opératoires* were implemented for. On this basis, it is possible to discuss the nature – whether functional or cultural – of the techno-stylistic variability of the assemblage. Shaping methods, surface treatments, petrographic compositions of the pastes, firing procedures and morphological variants within the assemblage have been sorted to identify traditional ways to produce ceramics, specific to certain social groups.

Each *chaîne opératoire* was typical of a particular group of craftspeople because it was transmitted through generations by a specific network of apprenticeship and, therefore, it expressed the technical identity of the social group underlying the technical tradition (Gelbert 2003, 2005; Gosselain 2002; Roux and Courty 2005, 2007; Roux 2010; Baldi 2013a, 2013b). Hence, the different traditional *chaînes opératoires* can be observed in their synchronic spatial distribution as well as in their diachronic evolution through conservatisms, borrowings (i. e. in their continuities), disappearance of some of them and emergence of some innovations (that is in their discontinuities).

The first moment of the study consists in distinguishing technical entities and their variants: recurrent combinations of macro traces of fashioning and finishing show a set of specific operations or techniques that correspond to different technical groups.

In a second phase, within the different technical groups, all sherds are classified on the basis of their petrographic features, both on the basis of the fine mass (its colour, aspect and granulometry) and of non-plastic inclusions (nature, size, distribution, morphology and quantity).

The third and concluding stage of the analysis is represented by the morphological and stylistic classification (that is a traditional typology) of the sherds within each techno-petrographic group.

The sorting of all these aspects allows to recognize both regional parallels and evolutionary elements. Indeed, the results largely confirm the technical panorama documented during the 2015 campaign for the assemblage from Trench C at Girdi Qala. Nevertheless, some new elements seem to be particularly relevant for the evolution of the *chaînes opératoires* in the micro-region of Girdi Qala and Logardan.

The chalcolithic ceramics discovered during the last campaign are shaped by (Fig. 1):

- ▶ 1. a moulding technique;
- ▶ 2. overlapping rounded coils (namely rings) of 2-2.5 cm thick¹, with sub-elliptic section and external oblique orientation;
- ▶ 2.i. wheel-coiling technique (by overlapping rounded coils of about 2 cm thick and then finishing the containers by the rotational kinetic energy;
- ▶ 3. overlapping flattened coils of 3-3.5 cm thick, with sub-elliptic section and alternating oblique orientation;
- ▶ 3.i. wheel-coiling technique (by overlapping flattened coils of 3.5 cm thick and then finishing the containers by the rotational kinetic energy;
- ▶ 4. hollowing out a lump of clay and pinching and stretching it.

Techniques 2.i and 3.i are sporadically documented during the Early Uruk phase: it means that wheel-coiling – attested by some rare and fine small-sized bowls – constitutes a complex and uncommon variants of two distinct coiling traditions (2 and 3). These ones are characterized by an important dimensional difference of the coils and by an unlike disposition of the junctions (sub-elliptic section with external oblique orientation for Technique 2 vs. sub-elliptic section with alternating oblique orientation for Technique 3). Yet, both of these shaping methods seem to disappear in the Middle Uruk phase, when the wheel-coiling is not documented at all during the central centuries of the 4th millennium BC. Only the next campaigns will reveal whether this absence of data depends on the fact that, for the moment, the excavated areas for the Middle Uruk (especially in Trench D at Girdi Qala northern mound) are quite restricted, or if the wheel-coiling (and therefore the use of the potter's wheel) completely disappears at the beginning of the Middle Uruk (local LC3) period².

Anyway, the restricted number of techniques and petrographic variants indicates that, as already demonstrated for other sectors of the 4th millennium northern Mesopotamia (Baldi 2012c, 2012d), the ceramic production was a very hierarchized and centralized activity,

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1. During the 2015 campaign, a first examination of the sherds belonging to this technical group led me to estimate the thickness of the coils was about 1.5 cm. Later, it has been possible to verify that this evaluation (made essentially on the basis of surface grooves and cracks corresponding to the junctions of the coils) was inaccurate. Indeed, according to the inclination of the joints between the coils used for this technique, their thickness (measured not only on the surfaces but also on the transversal sections) is a bit greater, around 2-2.5 cm.
 2. A temporary abandonment of this technique would not be surprising, since similar data, with a discontinuity in the use of the potter's wheel during the LC3 and a reappearance in the LC4-LC5, have already been observed in northern Syria (Baldi and Roux 2016: fig. 9).

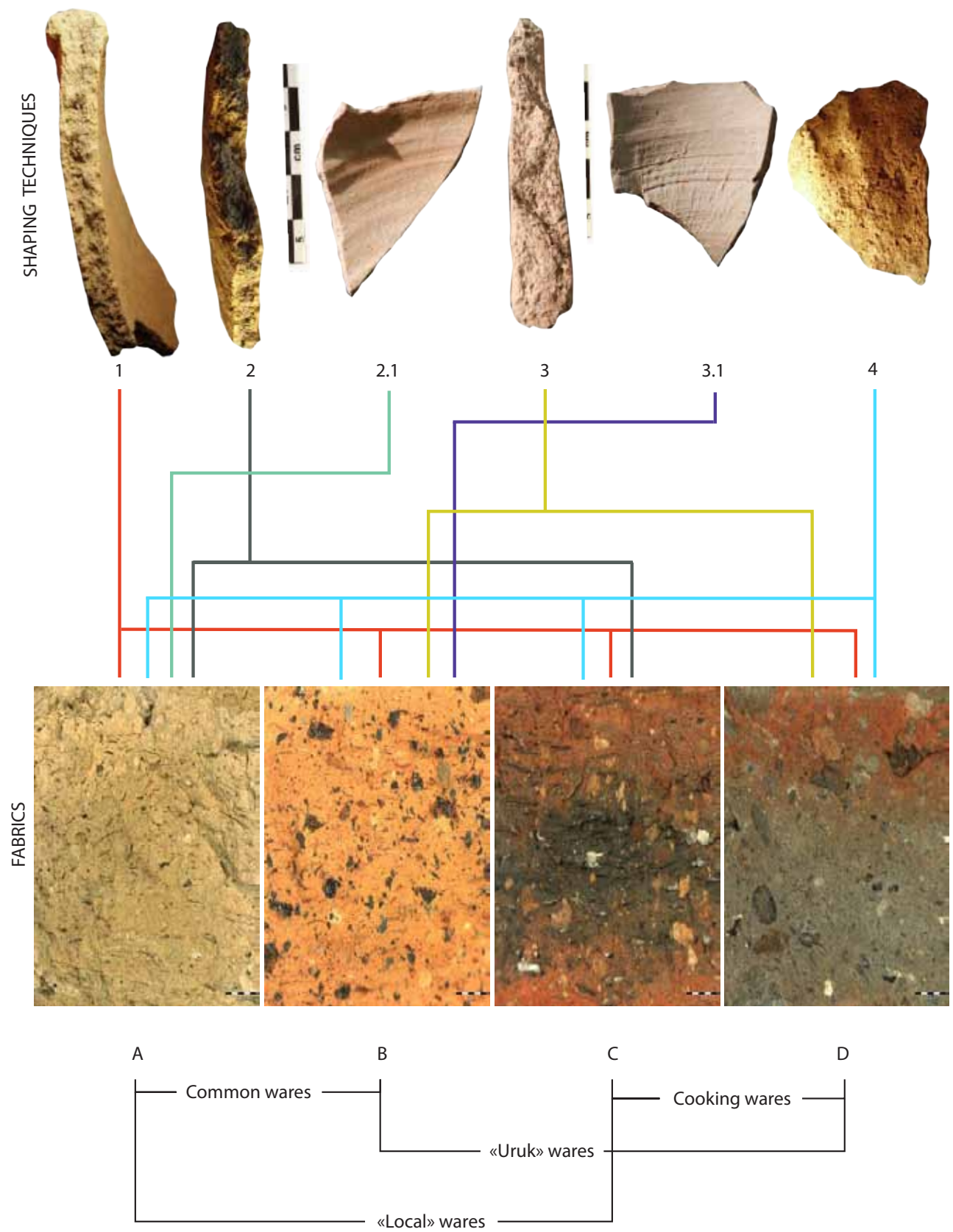


Fig. 1 - "Chaines opératoires" of the 4th mil. BC

carried on by a restricted number of specialists. These artisans were in charge of the manufacture for large groups, exceeding by far the horizon of their own village community, as also suggested by the kilns in the centralized firing area at Girdi Qala Trench C³.

Four main petrographic macro-groups have been identified.

- A Group: beige or brownish porous fabrics, fired in an incomplete oxidizing atmosphere during short firing cycles (sometimes grey core), with abundant coarse vegetal and dispersed mineral inclusions (mainly basalt, quartz, sub-angular calcite, ferruginous particles and micas).
- B Group: beige and light orange dense mineral fabrics, fired in oxidizing atmosphere, with traces of serpentine and carbonates in the fine mass of the clay, and significant quantities of grinded shells and ferruginous inclusions.
- C Group: orange-reddish fabrics, fired in incomplete oxidizing atmosphere (short firings, black core) with large vegetal and small-sized mineral inclusions (basalt, limestone) and coal particles.
- D Group: orange-brownish fabrics, fired in reducing atmosphere (grey core and surfaces), with abundant basalt, quartz and metamorphic inclusions (silicates, chlorite, marble, etc.).

Petrographic Groups A and B gather different common wares and some (rare) fine wares (with depurated small-sized inclusions), while Groups C and D are cooking wares.

During the 2015 campaign, it became apparent that, despite some kind of distinction, there is no real dichotomy between local and Uruk wares. Indeed, fabrics belonging to A and C Groups perfectly fit the definition of the well-known north-Mesopotamian Late Chalcolithic Chaff-Faced wares. Most often, in 2015, these pastes have been found associated with local ceramic shapes in Trench C at Girdi Qala. Therefore, they seemed to represent a local version (with raw materials largely available in the Qara Dagħ region) of the large north-Mesopotamian Chaff-Faced *koiné* (extended from central Mesopotamia to southern Caucasus – Marro 2010). On the other hand, B and D Groups, generally associated with foreign Uruk shapes in Trench C at Girdi Qala, seemed to reflect the south-Mesopotamian mineral tradition (Helwing 2002). This general framework includes some (rare) specimens belonging to A and B groups sharing a firing in a reducing atmosphere and, therefore, a grey aspect. These grey wares can be coarse chaff-faced vegetal (A) or mineral and relatively fine (B) tempered wares. Some kind of division is also visible on the basis of the shaping methods, since techniques 2-2i and 3-3i are always respectively associated with local-related (A-C) and southern-related (B-D) fabrics. But even in 2015 these technical traits did not seem to establish a sharp and unambiguous divide, with a clear dichotomy between the “Uruk” and the “local”.

The last campaign confirmed that there is no schematic distinction between “local” and “foreign” wares: indeed, in Girdi Qala and Logardan, data about ceramic pastes are not elusive in themselves, but rather they tend to evolve. In this sense, on the basis of the technical aspects examined in 2015 and 2016, it is possible to sketch some evolutionary trends about traditional *chaînes opératoires*.

3. See Vallet (ed.) 2015.

First of all, the notion of “foreign” wares is highly inappropriate because, even if sometimes associated with south-Mesopotamian ceramic shapes, all the fabrics are made of locally available raw materials, which demonstrates that the entire ceramic production (even the Uruk pottery)⁴ was essentially local. Moreover, during the Early Uruk phase (at Girdi Qala Trench C Levels 10-8 and, above all, at Logardan Trench D Level 4), all the fabrics are to produce ceramic shapes belonging to a south-Mesopotamian Uruk tradition. Actually, in the basal levels of Girdi Qala Trench C, straw-tempered fabrics (A and D Groups), frequently associated with local LC2 shapes (64% of the assemblage in Levels 10-8 at Girdi Qala C), were also used to manufacture Early Uruk ceramic types. In Level 4 at Logardan Trench D, in a context characterized by a complete absence of local LC2 materials, the same vegetal A and D Groups were routinely used for early Uruk types (53% of the assemblage). Likewise, in the same contexts, for the production of the same southern early Uruk shapes, mineral-tempered fabrics (B and D Groups) were used as frequently as the chaff-faced ones (about 47% of the sherds in Trench D Level 4 at Logardan). It clearly indicates that, at the beginning of the Uruk period (namely in the first moment of the cultural contact between local inhabitants and southern settlers), there was no distinction between the fabrics used for local LC2 shapes and foreign Early Uruk vessels.

This quite surprising technical framework is very coherent with the analysis of the 6th millennium pastes carried-out in 2015 for the Halaf and HUT pottery from Logardan Trench C. As a matter of fact, A, B, C and D Groups of fabrics were already documented amongst the pastes used in the western Qara Dagħ since the 6th millennium BC. A and C Groups are very conservative and remain unchanged over the Middle and Late Chalcolithic, while B and D Fabrics preserve their mineralogical composition, even once subjected to a quite noticeable process of adaptation. In particular, since the beginning of the 4th millennium, nature and quantity of the components of B Group remain the same they were in the 6th millennium BC, but their granulometry becomes increasingly coarse. Concerning D Pastes, they conserve the same mineralogy and fine mass than before, but they lose the coarse vegetal inclusions they had in the 6th millennium and become exclusively mineral-tempered. Thus, the appearance of the first Uruk ceramics does not imply the use of new raw materials or fabrics, but just some adjustments of previous petrographic traditions.

To obtain a more complete picture, this framework has to be integrated with the evolution of the shaping techniques. Amongst them, three of those attested in the 4th millennium contexts (Techniques 2, 3 and 4) were already documented in the 6th millennium assemblage from Trench C at Logardan. Nevertheless, since the Early Uruk phase, innovations are important. The potter's wheel briefly appear in the technical panorama with two variants of the wheel coiling technique (shaping Methods 2.i and 3.i), based on the different modalities of overlapping coils which are documented since the 6th millennium. Moreover, the long-lasting tradition of shaping by hollowing out a lump of clay (Technique 4) becomes more and more rare, and eventually disappears since the beginning of the Middle Uruk phase. In the same time, the moulding technique (1) emerges as an innovation since the beginning of the 4th

4. As demonstrated by Berman 1986: 243; Ghazal *et al.* 2008: 93-99, fig. 90-91; Emberling and Minc 2016.

millennium and becomes widespread during the Middle Uruk⁵. Both these shaping methods – the rising moulding technique (1) and the vanishing hollowing technique (4) – were associated with all the groups of fabrics (A, B, C and D).

Overall, the supposed divide between local Late Chalcolithic and foreign Uruk ceramic traditions does not appear as an obvious reality, but rather as an ongoing evolutionary process. In this dynamics, the Early Uruk phase represents a crucial moment. Some traditional techniques tend to disappear, some others emerge, while new complex shaping methods appear. On the basis of the last campaign, it is clearly evident that there is no reason to attribute these changes exclusively to new south-Mesopotamian people. On the contrary, the south-Mesopotamian artisans immediately adopt local pastes and adapt just some components in the preparation of some fabrics. Despite evident morpho-functional differences between local and Uruk repertoires, the integration between the respective production systems has been very high since the beginning of the 4th millennium and all technical innovations equally impact both Uruk and local shapes⁶. Later, in the Middle Uruk period, a kind of distinction emerges between local LC3 shapes associated with chaff-faced A-C Fabrics, and Uruk shapes associated with mineral B-D Pastes. In 2015, this dynamics was recognized as a quite fuzzy scheme⁷ within the assemblage of Trench C at Girdi Qala and, on the basis of similar data from the Euphrates and Khabur basins⁸, it was interpreted as the corollary of increasing technical borrowings between local and Uruk traditions. Actually, it was the opposite. After the 2016 campaign, it is possible to identify a tendency towards a distinction between local and Uruk traditions during the Middle Uruk: if, during the Early Uruk, both the repertoires shared the same wares, in the Middle Uruk, south-Mesopotamian shapes were more and more frequently made of mineral fabrics, while local shapes remained mainly linked to chaff-faced pastes.

Actually, the technical analysis of the ceramic *chaînes opératoires* at Girdi Qala and Logardan show the cultural contact between local and Uruk craftsmen under a completely new light: not just as an encounter between distinct realities, but rather as an emerging differentiation on the basis of a widely shared substrate.

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5. In 2015, on the basis of the materials from Trench C at Girdi Qala, it was doubtful if the moulding technique (used for about 16% of the assemblage from Girdi Qala Trench C) was to consider as an emerging innovation or as a disappearing tradition. But after the last campaign, it has been possible to carry-out a finer diachronic analysis. During the Early Uruk (at Girdi Qala Trench C Levels 10-8 and at Logardan Trench D Level 4), the moulding technique represents about 4% of the assemblage, while in Middle Uruk contexts (at Girdi Qala Trench C Levels 7-1 and Girdi Qala northern mound Trench D) it was used to produce about 28% of the ceramics. This trend is confirmed by similar data from other sectors of the northern Mesopotamia (Baldi and Roux 2016) and clearly suggests that the moulding technique was a new and rapidly emerging shaping method.
 6. In this sense, the hollowing-out technique disappears in the same time within both the repertoires, the moulding technique spreads amongst Uruk shapes as amongst the local ones and, at the end of the LC2, the potter's wheel is temporarily documented for some (both Uruk-related and local) rare and fine bowls.
 7. The most dramatic exception to this pattern is represented by the most typical shape of the Uruk repertoire, the bevelled-rim bowls, which continue to be manufactured using both mineral and vegetal fabrics.
 8. Substantial technical borrowings between local LC3-LC4 and Middle Uruk traditions are attested, for instance, at Hassek Höyük, Tell Feres and Zeytinli Bahçe (Helwing 2002; Baldi 2016; concerning Zeytinli, Frangipane personal communication)