

TRANSFORMING TRADITIONS OF MATERIAL CULTURE

Spatial and temporal patterns in pottery style, production and use during the second half of the 6th millennium cal BC in south-eastern Transdanubia and beyond

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One of the most salient traits of a major milestone in European history, the shift to a Neolithic life-style in Central Europe and the associated social changes, was the emergence of pottery production. The main goal of the research project described here is the study of Neolithic pottery production from a complex perspective and the addressing of the associated distinctive social activity types and potential range of meanings during the period from the late Starčevo to the appearance of the Lengyel culture (5500–4900 cal BC). The springboard for our project was the series of intensely investigated sites in southern Transdanubia, a region that acted as a contact zone between the Neolithic communities of Central Europe and the northern Balkans, and thus played a key role in the neolithisation of Central Europe. The research findings from this region are complemented and compared with the data from various sites along the Danube. Aside from our academic colleagues, our research results can be of interest to the broader public too, and our reconstructions of various artefacts and the documentation of our archaeological experiments can be later used as illustrations to museum exhibits. The expected results can be fitted into the broad picture outlined by other research conducted on these sites and offer an exceptionally detailed picture of how the region's settlements developed during the second half of the 6th millennium BC.

INTRODUCTION

The study of ceramic inventory is traditionally one of the key fields in research on Neolithic settlements. The immense quantities of pottery finds surviving in a good state of preservation amid the climatic and pedological conditions of Central Europe – including Transdanubia, our study region – are particularly suited for comparative studies on settlements owing to their immense typological variability. The main goal of previous studies was the determination of relative chronological sequences based on the occurrence of certain pottery forms and elements of decoration. However, the radiocarbon measurements performed on larger series during the past few years have revealed that the ceramic styles believed to have been diachronic were in fact contemporary in several cases. It also became clear that the conventional boundaries between ceramic styles as defined by earlier research were spatially more fluid than previously assumed.

RESEARCH ON THE 6TH MILLENNIUM BC IN SOUTH-EASTERN TRANSDANUBIA DURING THE PAST DECADES

The excavations ahead of the construction of the M6 and M7 Motorways between 2000 and 2008 yielded high quantities of finds that provided meaningful insights into settlement structures and thus formed a sound basis for various research projects launched by the Institute of Archaeology of the Research Centre for the Humanities of the Hungarian Academy of Sciences, alongside several projects undertaken as part of international academic cooperation (OROSS, 2013; MARTON, 2008; 2015; MARTON & OROSS, 2009; 2012; JAKUCS et al., 2016; 2018; JAKUCS & VOICSEK, 2015; 2017; OROSS et al., 2016a; 2016b; 2016c; WHITTLE et al., 2013). Research grants from the National Research, Development and Innovation Office (NKFIH) and the National Cultural Fund (NKA) provided the necessary funds for intensive and complex research in three southern Transdanubian micro-regions between 2015 and 2019 whose goal was a better understanding of the broader environment of the already excavated extensive settlements, of possible settlement clusters

and of the one-time settlement networks, and which also offered the opportunity of comparing various simultaneously existing ceramic traditions both on the regional scale and in a broader spatial context (OROSS et al., 2016a; 2016b; 2016c; JAKUCS et al., 2016; 2018).¹

Continuing this research, a new project funded by an NKFIH grant was launched in December 2019 (“Transforming traditions of material culture. Spatial and temporal patterns in pottery style, production and use during the second half of the 6th millennium cal BC in SE Transdanubia and beyond”, NKFIH Grant K-19/132663), focusing on the early history of pottery production in the central areas of the Danube region between the Early and the Late Neolithic, from the late Starčevo period to the appearance of the Lengyel culture (5500–4900 BC). Southern Transdanubia was a contact zone between the Neolithic communities of the Balkans and Central Europe in the second half of the 6th millennium BC, where recent research indicated that there was extensive intermingling between the material cultures of the different cultural groups (MARTON & OROSS, 2012; OROSS et al., 2016b; JAKUCS & VOICSEK, 2015; 2017; JAKUCS et al., 2016). The contemporaneity as well as a mixing between the late Starčevo, the early Vinča, the Ražište and the Central European Linearbandkeramik (LBK) can be seen in south-eastern Transdanubia. At the same time, the sites in the Balaton region, in the region’s central area, are characterised by a large-scale mixing of the late ceramic styles



Fig. 2. The typical ceramic styles of the mid-sixth millennium BC in south-eastern Transdanubia, a.: Vinča-style biconical vessel fired using the ‘black-topped’ technique, covered with a red slip and decorated with channelling from Szederkény-Kukorica-dűlő; b.: biconical vessel with incised decoration of the early style of the Central European Linearbandkeramik from Balatonszárszó-Kis-erdei-dűlő (photo: I. Füzi)

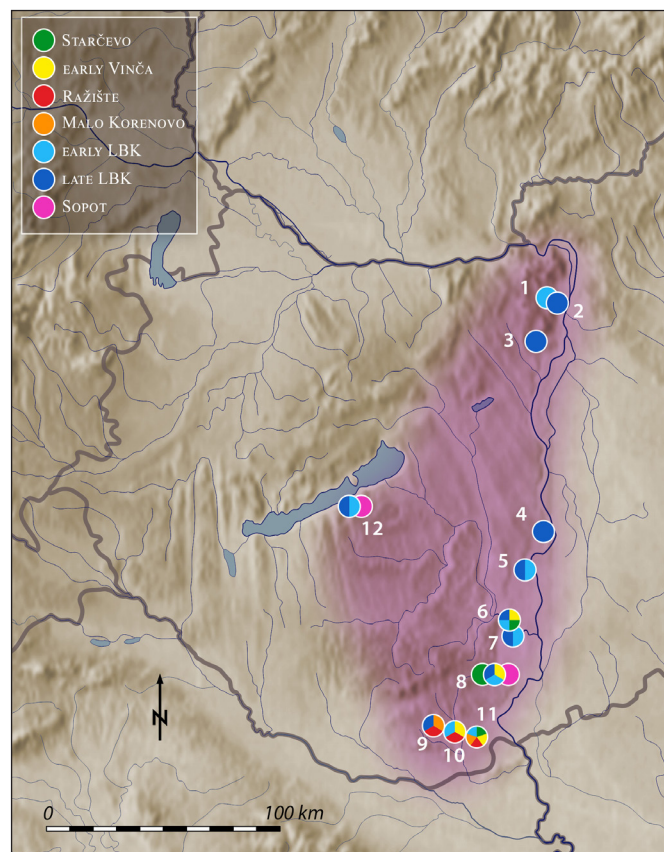


Fig. 1. The study area in eastern Transdanubia and the sites studied as part of the project. The coexistence of ceramic styles are indicated for each site and the number of clearly separable Neolithic settlements in each location is also marked: 1. Budapest III. – Aranyhegyi út, Mocsáros-dűlő; 2. Budapest III. – Nánási út 75–77; 3. Törökbálint-Égettvölgy; 4. Bölcse-Gyűrűsvölgy; 5. Paks-Gyapa-Rostipusztá; 6. Tolna-Mözs-Községi Csádés földék; 7. Tolna-Mözs-Szarvas-dűlő; 8. Alsónyék-Bátaszék; 9. Szemely-Irtás; 10. Szederkény-Kukorica-dűlő; 11. Versend-Gilencsa; 12. Balatonszárszó-Kis-erdei-dűlő

of the Central European LBK, while the so-called classical Sopot style made its appearance in eastern Transdanubia in the last centuries of the 6th millennium BC (Fig. 1). In addition to the ‘pure’, clearly distinguishable ceramic styles (Fig. 2) and the mixing within the same archaeological feature (Fig. 3), a strong hybridisation can also be assumed (Fig. 3). However, our research questions are not restricted to the critique of the ‘traditional’ typo-chronological schemes. Our initial findings indicate that changes in the spatial and chronological dynamics of ornamental styles are not always

1 “Neolithic communities in the contact zone between the Balkans and Central Europe in the second half of the 6th millennium BC” (NKFIH Grant K 112366); “Non-invasive survey of Neolithic settlements in southern Transdanubia and the Balaton region” (NKA Grant 207134/00349); “The architecture of early farmers in Transdanubia: A research excavation for investigating occupation patterns and stratigraphy at Tolna-Mözs” (NKA Grant 207134/00348).



Fig. 3. Vessels with a similar, slightly S-profiled form, but decorated in a different style from the later sixth millennium BC, a.: Central European Linearbandkeramik vessel decorated in the typical Želiezovce style with incised linear bands from Balatonszárszó-Kis-erdei-dűlő; b.: 'hybrid'-style vessel characterised by formal traits of the Ražište ceramic style, but fired using the 'black-topped' technique and covered with a red slip typical for the Vinča style, and decorated with incised band interrupted with short incisions and short stabs from Szemely-Irtás (photo: I. Füzi)

Balatonszárszó-Kis-erdei-dűlő, Tolna-Mözs-Közégségi Csádés földek and Szederkény-Kukorica-dűlő. We also intend to include additional sites such as Versend-Gilencsa, Szemely-Irtás, Tolna-Mözs-Szarvas-dűlő and Alsónyék-Bátaszék. It is prudent to include sites along the Danube lying beyond the primary study area where a mixing of potting traditions was observed to a lesser extent or not at all, at least using traditional archaeological pottery analyses. Therefore, our plans include the study of pottery from several sites known from the archaeological literature such as Paks-Gyapa-Rosti-puszta, Bölcske-Gyűrűsvölgy (FÜZESI, 2012; SEBŐK, 2013), Budapest III-Rómaifürdő-Nánási út 75–77 and Budapest III-Aranyhegyi út, Mocsáros-dűlő (M. VIRÁG, 2014), as well as Törökbálint-Égettölgy as part of the project.

accompanied by changes in technological traditions. Thus, certain emblematic technological traits transcend both the boundaries of conventional archaeological 'cultures' and the boundaries of archaeological periods hallmarked by the transformation of ceramic styles (Fig. 4). Being a border zone or, better said, a transitional zone in terms of material culture, the study area is particularly suited to mapping the formal, technological and functional patterns of pottery and to the reconstruction of the social roles of Neolithic pottery production as well as to modelling certain social dynamics.

The basic study region incorporates the intensely investigated sites in southern Transdanubia, a region that played a key role in the neolithisation of Central Europe. Good series are available from the region's extensive settlements such as



Fig. 4. Typical ceramic styles of the mid-sixth millennium BC in south-eastern Transdanubia, a.: low pedestalled bowl with painted spiral ornamentation typical for the Starčevo ceramic style from Alsónyék-Bátaszék; b.: Vinča-style vessel fired using the 'black-topped' technique, covered with a red slip and decorated with channelling from Szederkény-Kukorica-dűlő; c.: Vinča-style biconical pedestalled bowl fired without using the 'black-topped' technique and lacking a red slip from Tolna-Mözs-Közégségi Csádés földek; d.: typical biconical vessel with incised decoration, originally set on a high pedestal, of the early style of the Central European Linearbandkeramik from Balatonszárszó-Kis-erdei-dűlő (photo: I. Füzi)

GOALS, QUESTIONS, METHODS

The research project addresses issues of Neolithic pottery from three main aspects. The first involves the study of forms and decorations, the classification of different combinations of ceramic forms and elements of decorations based on their spatial and chronological distribution. The second is technology, the study

of ‘technological style’ in terms of the treatment of raw material and potting techniques as well as firing methods and surface treatment. The third is the functional study of pottery, both in terms of practical usage and in terms of pottery as an expression of social roles. The integrated analysis of the main aspects of pottery production and consumption offers the potential of reconstructing the entire *chaîne opératoire* of pottery production and thereby enriching our knowledge of this region, while, at the same time, offering new avenues in the interpretation of ceramic assemblages.

FORM AND DECORATIONS

The interpretation of formal and ornamental elements, i.e. a typological analysis, essentially means the classification of a given group of artefacts into formal classes and the identification of possible correlations between them. At the same time, this analysis can hardly neglect the metrical study of the physical manifestation of actual forms. For example, there was a clear correlation between the sizes of the vessels assigned to the same formal class and the typical ornamental techniques in the ceramic material from Balatonszárszó (Fig. 5).

Therefore, one of the main goals of the project is the creation of a uniform system for describing pottery styles and of a catalogue based on the key sites along the Danube in eastern Transdanubia, which, combined with statistical methods and a GIS-based database integrating the data will provide a sound basis for the interpretation of interregional and regional as well as intra-site and even household-level distribution of individual stylistic elements (MARTON, 2013). The mapping of the spatial distribution of permanent combinations will

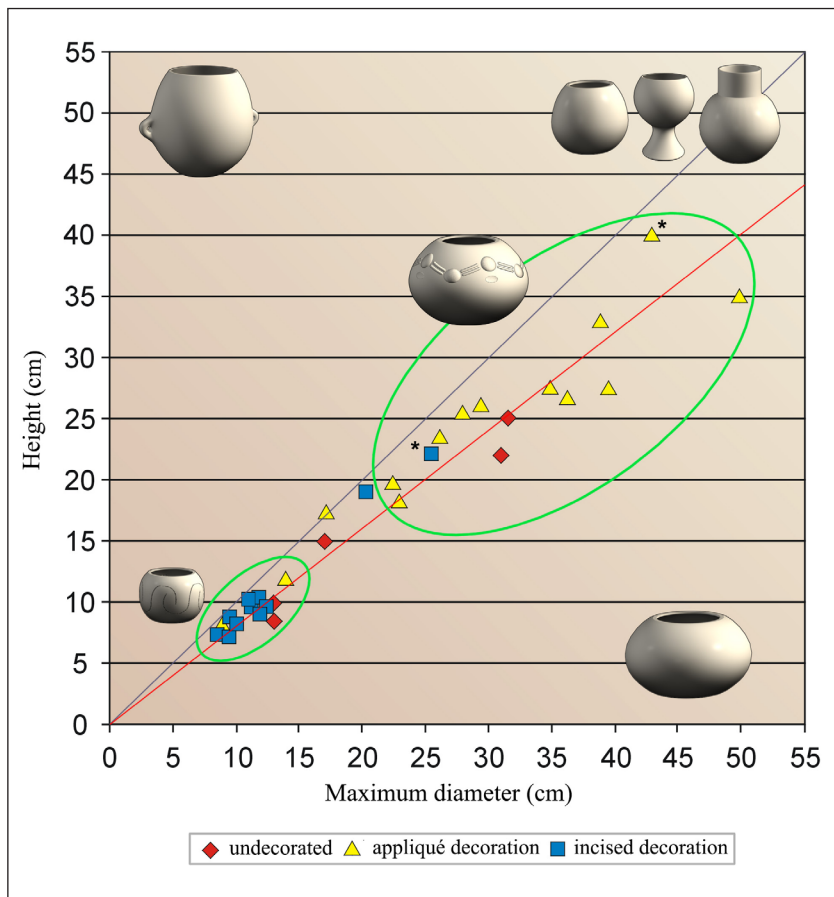


Fig. 5. Distribution of the height and diameter of the globular vessels according to the typical decorative elements from Balatonszárszó-Kis-erdei-dűlő

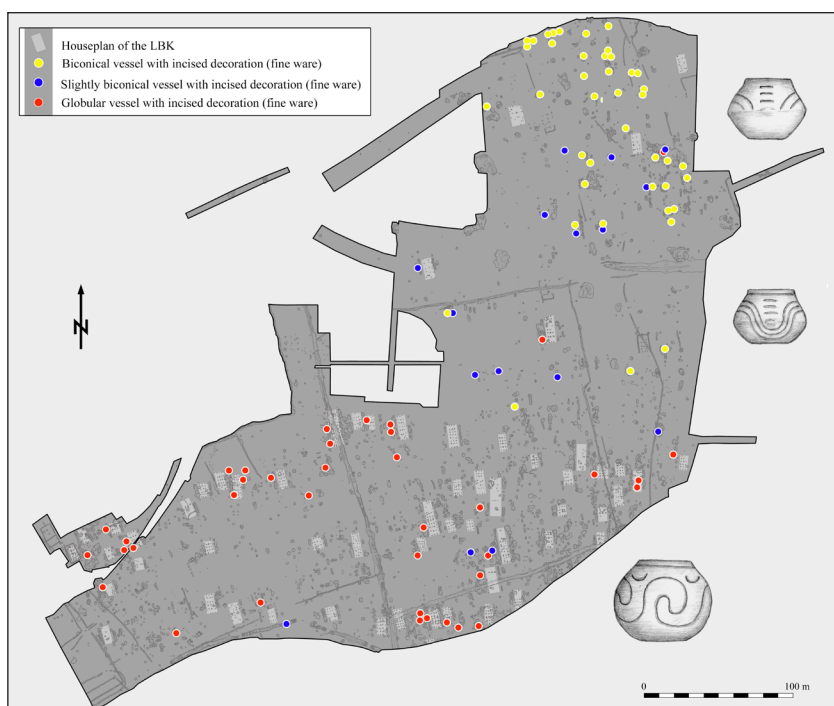


Fig. 6. Spatial distribution of closed vessel types (biconical, biconical with rounded carination, globular forms) representing fine ware with incised decoration at Balatonszárszó-Kis-erdei-dűlő

contribute to outlining the main tendencies of change. Patterns in the spatial distribution of different types could be clearly identified in the case of closed forms of fine pottery from Balatonszárszó, alongside a correlation between their forms and decorations. A ‘sequence of development’ could be identified in sharply carinated biconical forms through rounded biconical types to globular vessels, which can apparently be correlated with the changes in incised decorations, with a development from short incised motifs to an increasingly elaborate ornamentation combined with ancillary motifs and panels encircling the vessel (*Fig. 6*).

TECHNOLOGICAL STYLE

The technological aspects of pottery, one of the main source materials in archaeological research, are studied and interpreted within the framework of technological style, a complex system. Technological style includes all the standard patterns ranging from the selection of the raw material and the choice of tempering agents to the technique of vessel building and vessel ornamentation, surface treatments and firing techniques. The large series of radiocarbon dates available for certain sites – complemented with measurements from so far non-radiocarbon dated sites – provides an opportunity for the study of the time-span during which certain technological practices were present in the study area as well as for determining possible correlations between the dynamics of the changes and the transformation process of the ornamental styles, the latter being better known to some extent.

We plan the complex interdisciplinary study of ceramic technology in the course of the project. Raw material sources will be identified based on the petrographic comparison of samples taken from pottery and corings performed in the broader area of the sites according to an already established procedure (KREITER et al., 2017b), which will offer a much more detailed picture of raw material processing and tempering methods, and thus of technological styles (*Fig. 7*). While we have already studied the treatment of raw materials and tempering with the aid of thin sections on some sites (KREITER et al., 2017a), the identification of patterns on a larger scale calls for additional sampling across a broader area.

We shall perform geochemical analyses (main elements/trace elements) on a part of the pottery fragments that differ from the average within the larger studied series in order to determine their local or non-local origin.

The changes in ceramic technology was studied on three sites in south-eastern Transdanubia: a total of 267 samples have been analysed from Balatonszárszó-Kis-erdei-dűlő, Tolna-Mözs-Községi Csádés földek and Szederkény-Kukorica-dűlő.

We looked at changes in potting traditions in the five style groups distinguished on the basis of typical combinations of forms and decorative elements in the pottery material from the Balatonszárszó settlement of the Central European LBK. We found that only a few raw material types were used in the earliest occupation phase and that clay was exclusively tempered with chaff, which corresponds to the distinctive technological traits of the Starčevo-(and Körös-)style potting traditions (KREITER, 2010). There was a definite tendency towards a much greater variability in raw materials during later periods, alongside the increase in pottery lacking chaff (KREITER et al., 2017a; 2019). It must also be noted that earlier potting traditions could be observed during the entire sequence (*Fig. 8*).

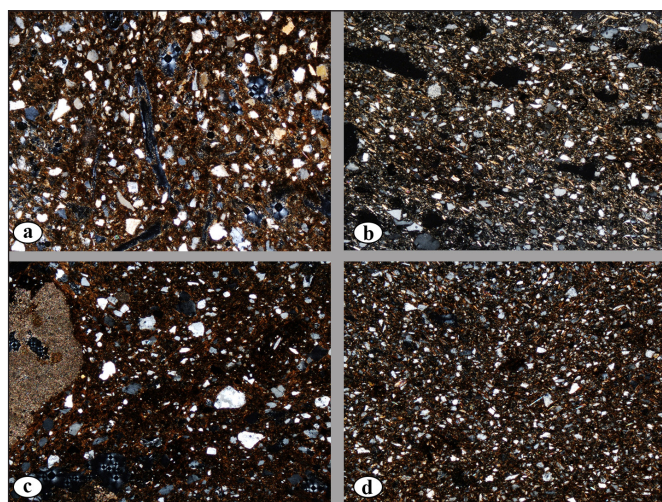


Fig. 7. Main raw material types of the vessels from Balatonszárszó-Kis-erdei-dűlő according to the thin sections, a.: very fine-grained/fine-grained non-calcareous fabric with chaff tempering; b.: very fine-grained fabric with chaff tempering; c.: fine-grained/medium-grained calcareous fabric tempered with sand and chaff; d.: non-calcareous fabric lacking any tempering agent

At Tolna-Mözs-Községi Csádés földék, Central European LBK material was found together with certain typical stylistic elements of Starčevo- and Vinča-style pottery, a variability that was also reflected in ceramic technology. Starčevo-type vessels were usually tempered with chaff. In contrast, the manufacturing techniques of LBK pottery in the typological sense reflected some change, namely a decrease in the use of chaff as a tempering agent. Vinča-style pottery was likewise predominantly made without chaff.

At Szederkény, the overwhelming majority of the ceramic inventory could be assigned to the Vinča style and the distinctive traits of the Ražište style were also attested. In contrast, the proportion of Central European LBK pottery was negligible. Similarly to Starčevo technology, a part of coarse pottery was consistently tempered with chaff. The greater part of the Vinča-style fine pottery did not contain chaff or only little amounts.

When studying ceramic technology, special attention will be accorded to the micro-botanical identification of vegetal tempering agents and changes in the use of chaff temper. These examinations will also cover vegetal siliceous particles, i.e. phytoliths, occurring in the raw material. The analytical methods have been tested on Neolithic pottery (KREITER et al., 2013) and in the course of experimental archaeological procedures (PETŐ & VRYDAGHS, 2016).

Another viable means of distinguishing between technological traditions is the study of potting techniques, principally based on the interpretation of ceramic cross-sections (GOMART, 2011; 2014; 2017; GOMART et al., 2017; KREITER et al., 2017a). In the case of certain emblematic pottery types, we will test and model the procedures (GOMART et al., 2017; 2020), which we recorded as part of our technological studies with the inclusion of experimental archaeological methods, which will enable the reconstruction of those aspects of manufacturing that cannot be identified using archaeometric analyses. The identification of the variability in technological phases will contribute to studies on social behaviour, for example to issues regarding the specialisation of potters and the technological traits that can be linked to specific household types or smaller social groups, either on the site or on the micro-regional level.

QUESTIONS OF FUNCTION

We shall cover issues relating to function as part of a series of analyses integrating several methods. The expected results of lipid analyses on several hundred pottery fragments from several sites, currently in progress, will provide clues to the primary function of the vessels (MATLOVA et al., 2017). We plan to complement these findings with high-resolution microscope imaging and experimental methods that are relevant to the functional analyses conducted as part of the project (GUCSI, 2006; 2009), with which we hope to answer the following questions: What is the reason for the recurring use-wear traces on certain vessels? What kind of recurring traces, indicating secondary usage, repairs and intentional damage, can be identified on the region's pottery finds? Similarly to the ornamental and technological styles, we shall incorporate our findings into a uniform system and will analyse their spatial distribution on the level of sites as well as on a regional level. In addition to identifying the primary function of the vessels, we shall also try to determine their secondary social function, principally based on the special traits or special contexts of certain types.

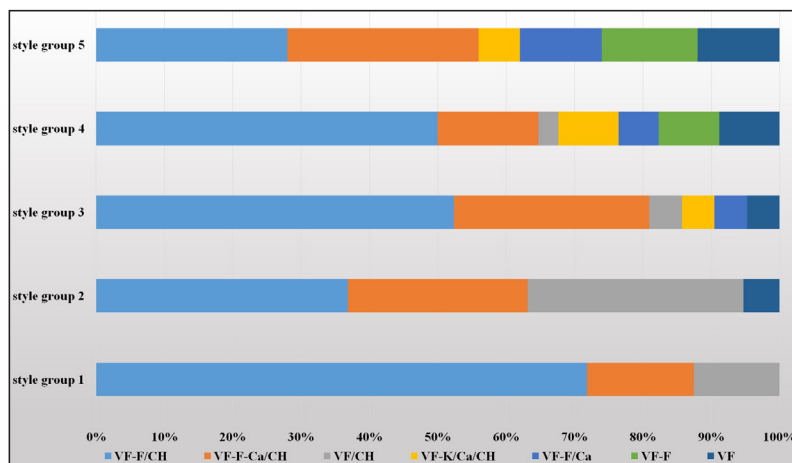


Fig. 8. Distribution of main fabric types according to ceramic styles at Balatonszárszó-Kis-erdei-dűlő

TOWARDS A SOCIAL ARCHAEOLOGY: PRELIMINARY CONSIDERATIONS

We shall also undertake a series of basic analyses as part of the research project that have not or have hitherto been conducted to a limited extent only on the sites of the study region. The ceramic finds will be analysed in a complex manner and independently of the conventional archaeological categories – such as ‘culture’ and ‘style’ – on a regional comparative basis. One of our goals is to gain insights that can be interpreted in a social archaeological context that can then be tested, among others, against the findings of ethnoarchaeological studies.

Given that we may justifiably assume that function, style and technological behaviour were influenced by partially differing social and environmental factors, a distinction between the potential roles and potential range of meanings within the social context of production and consumption seems particularly important when interpreting the findings.

Form and decoration are not necessarily linked to the identity of the potter producing the vessel, but can equally well reflect the traditions, taste and demands of the community for which it was made and where it was used (DIETLER & HERBICH, 1994; ROUX et al., 2017). Previous studies have indicated that style boundaries can be considerably more fluid in time and space than technological boundaries (GOSSELAIN, 2000). While it seems likely that certain vessels played a distinctive symbolic role in the life of a community owing to their function or ornamentation, it remains a matter of controversy whether ceramic style in itself conveyed coded meanings that acted as symbols expressing a broader group identity in the wider circle of the vessels’ users (DIETLER & HERBICH, 1994).

At the same time, technological actions are part of the norms of a smaller social group whose covert and embedded display is fitted into the broader symbolic system (DOBRES, 2000; ROUX et al., 2017). The mastering of various technological practices calls for long and intense social interactions (Gosselain, 2008; KREITER et al., 2017a; ROUX et al., 2017), the implication being that these traditions are highly conservative and less prone to change. Archaeological and ethnoarchaeological studies have convincingly demonstrated that ceramic technological traditions often transcend social and cultural boundaries, and are more resistant to cultural changes than the formal and ornamental traits of pottery (DIETLER & HERBICH, 1994; ROUX et al., 2017). On an individual level, association with a group practicing various technological actions in a similar manner is the result of social learning, and thus technological traditions are by necessity linked to the traditions of the potter’s original, narrower social group. These traditions can therefore be regarded as markers of the potter’s identity and they also convey important information regarding the role of pottery and technology in particular social interactions (GOSSELAIN & LIVINGSTONE SMITH, 2005; GOSSELAIN, 2011).

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