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# NEOLITHIC FINE POTTERY: PROPERTIES, PERFORMANCE AND FUNCTION<sup>1\*</sup>

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**Abstract:** *This paper discusses the concept of fine pottery, including the criteria for its identification, the relations between surface treatment and fine fabric, and its physical and mechanical properties. The main focus is the frequency of fine pottery and its position in the ceramic assemblage in the Early and Late Neolithic, as well as the identification of the functions that the fine bowls may have had. The differences in frequency percentages of the fine pottery in the collections of the Early and Late Neolithic are explained by unequal use frequencies, while the differences in functions are explained by the different ways of living and food habits of the Neolithic population.*

**Key words:** *fine pottery, Early Neolithic (Starčevo), Late Neolithic (Vinča), physical properties, formal properties, performance, formation processes, use-life, use-wear traces, function*

**Апстракт:** *У раду се разматра појам fine керамике: критеријуми за њену идентификацију, однос обрада површина и fine фактуре; њена физичка и механичка својства. Акцент је стављен на заступљеност fine керамике и њено место у оквиру керамичког асемблажа у старијем и млађем неолиту, као и на идентификацију функције fine здела. Разлике у процентуалној заступљености fine керамике између асемблажа старијег и млађег неолита објашњене су различитом учесталошћу употребе, а разлике у функцији – различитим начином живота и потреба носилаца неолита.*

**Кључне речи:** *фина керамика, рани неолит (Старчево), касни неолит (Винча), физичка својства, формалне особине, формациони процеси, употребни век, трагови употребе, функција.*

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Fine ceramics holds a prominent position in the analyses of Neolithic pottery assemblages. It is not unusual, especially in the earlier literature, that it is the only subject of studies, with pottery of coarse fabric being completely ignored. This is due to consideration of fine ceramics as the most representative samples of pottery which comprises vessels of fine elegant shapes, often decorated with painting or ornaments executed in some other techniques. Furthermore, this consideration was the main reason why only fragments belonging to fine vessels were selected during excavations, while other fragments were mostly discarded. This has resulted in the emergence of a wrong image associated with the Neolithic, especially Starčevo, pottery as being dominated by vessels of fine fabric and thin walls.

Although fine ceramics has been the subject of many discussions, this category of ceramic finds still seems to be haunted by uncertainty and its position in the totality of the ceramic material has not been defined yet. Besides, what is understood by the notion of fine ceramics is not always clear as the literature provides examples of inconsistent use of terminology creating misunderstanding between experts. Thus, the need to clarify the following issues arises: What is fine pottery? What are its mechanical and physical properties? Why does it appear in relatively small quantities? Was it luxury or utilitarian goods available to everyone?

### **What is fine pottery?: Identification criteria**

Prior to discussing fine pottery, the criteria based on which it can be identified should be defined. When fine pottery is referred to, especially in the earlier literature, it is not always clear if it is the pottery with fine fabric or it has to do with the pottery with finely worked external and/or internal surfaces. For example, D. Garašanin, speaking about fine pottery, actually implies pottery with burnished surfaces (Arandelović - Garašanin 1954: 73-74); similarly, M. Garašanin points to the differences between „ordinary“ and fine pottery, which are made of the same „well refined earth“, noting that the former has only smoothed and partly burnished surfaces, while the latter has polished surfaces (Garašanin 1979: 88-89). Based on these views, the criterion for distinguishing fine pottery could be treatment of surfaces. Thus, we shall consider the results of the statistic analyses of the Starčevo and Vinča pottery with regard to that attribute.

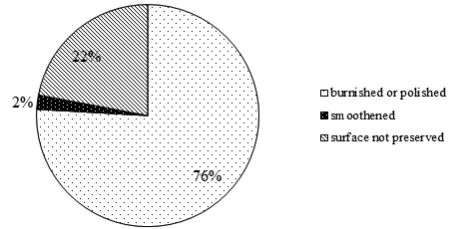
The analyses of the Early Neolithic pottery from Blagotin have shown that burnished surfaces, with or without slip, predominate in the ceramic material, regardless of fabric or morphology of the vessels. The pottery of medium fabric with admixture of chaff and sand prevails at this site (83%), and within this quantity, the most frequent surface treatment is burnished slip on both sides (32%), or on the external side only (14%). As for the shapes of vessels, it should be noted that surfaces with fine treatment - burnished or polished, with or without slip - can be found with all types:

bowls, S-profiled vessels, and pear-shaped vessels with four handles (Vuković 2004: 94-95).

The statistical analyses of the Late Neolithic Vinča pottery have shown that fine treatment of surface - burnished and polished, can be applied on vessels of different fabrics and shapes. 76% of 22556 fragments and whole vessels recovered during the two excavation campaigns at the site of Vinča (in 2004 and 2005) belong to vessels with burnished or polished external surfaces (fig. 1). Within this percentage, 67% fragments belong to vessels with medium fabric with admixtures of coarse or fine sand, shells, or less frequent, with admixtures of grog. Out of 7589 typologically assignable fragments, 97% has burnished or polished external surfaces. If the presence of burnished or polished surfaces is brought into relation to the typology of shapes, such surfaces seem to appear regularly on bowls (98%) and amphorae (97%).

This short review of the statistical data clearly shows that burnished and polished surfaces appear with very heterogeneous groups of pottery finds. On one hand, they can be present on vessels with various fabrics, including those with larger quantities of coarse admixtures. Moreover, they appear with the completely different functional classes of vessels: from vessels for serving and consuming food, mostly small in size (bowls), to larger vessels designed for storage of liquid and solid foodstuffs (Vinča amphorae and Starčevo pear-shaped vessels) or thermal or mechanical processing (Starčevo S-profiled vessels, larger semi-globular and globular bowls). Therefore, fine surface treatment by no means can be taken as the criterion for distinguishing special type of pottery – fine ceramics.

However, if we consider vessels worked in fine fabric, certain regularity that characterizes them seems to emerge. Namely, the statistical data show that only bowls were worked in fine fabric, both in the Early and Late Neolithic. Although bowls can be made in any fabric, fine fabric is reserved for small-sized bowls only. As a rule, without a single exception, both sides of all bowls are finely burnished or polished, and when it comes to Starčevo pottery, burnished slip is inevitable<sup>1</sup>. Thus, a distinguished group of ceramic fragments characterized by the same formal properties is recognized. These are small-sized bowls with extremely thin walls of fine fabric and fine surface treatment (burnished, polished or with slip). Therefore, fine fabric has to be taken as the basic criteria for recognition of fine pottery as a separate type of ceramic material.



**Fig. 1** Frequency of outer surface treatments from the site of Vinča

**Сл. 1.** Обрада спољних површина посуда из Винче

<sup>1</sup> This assertion draws on the detailed statistical analysis of the Early Neolithic pottery from Blagotin and the Late Neolithic pottery from Vinča. It should be particularly noted that in either case there was no selection of material, but all recovered pottery fragments were taken into consideration.

### **What is fine fabric: Definitions**

However, making difference between fine surface treatment and fine fabric does not resolve the doubts regarding the definition of fine pottery. It is not rare in the archaeological literature that fine pottery is called pottery made of “refined” earth, unlike coarse pottery, which is made of “poorly refined” or “unrefined” earth. The fact that clay, being the main raw material for pottery production, is not earth at all is often forgotten. It consists of minerals and rocks taking the form of minute particles, generated by decomposition of magmatic and metamorphic rocks. Since clays come to existence in the process of decomposition, and then movement and transport of rocks, mostly under the influence of water, a considerable quantity of impurities, especially organic matter, can be traced in them (Zlatunić 2005). These impurities have unfavourable effects on the most important property of clay – plasticity, i.e. its ability to be mixed with sufficient quantity of water and create paste which can be pressed into a desired form to be retained even when the pressure is released (Libšer and Vilert 1967: 15; Shepard 1971: 14). Clay occurs in nature in various forms and with various quantities of naturally present coarse concretions, mineral or organic, but in this condition it lacks plasticity and cannot be used. In order to create conditions in which it can be shaped, it has to be refined. Separation can be done immediately upon extraction of clay from deposits or later by using different techniques (Rye 1981:). Once this process has been completed, different admixtures are added to clay. They will have an effect on varying properties of finished vessels. Having this in mind, any clay used for manufacturing of pottery vessels has to be refined, regardless of the kinds of admixtures which are added later on. Accordingly, the main criterion for distinction between fine, medium and coarse fabric should be the kind, quantity and size of admixtures (Shepard 1971: 131). Thus, pottery made in a fabric with a large quantity of coarse admixtures, such as pebbles or organic matters, cannot be considered fine pottery.

Based on these criteria, fabric can be identified by macroscopic examination of the cross section or by use of an ordinary magnifying glass, where coarse admixtures in fabric can be noted along with empty spaces created after organic matters burnt out. However, when it comes to fine ceramics it is more difficult to determine the presence of admixtures. Therefore, granulation, both of the main raw material and subsequently added admixtures, is recommended as the main criterion for classification of fabric. Fine pottery, according to this classification, is characterized by admixtures smaller than 0.5mm (Bronitsky and Hammer 1986: 90). This has to be taken into consideration when ceramics with fine sand admixture is being examined. Besides, the presence of powdered organic admixtures in fine pottery (ash, powdered dung) should not be completely excluded, although they can be identified only by means of interdisciplinary analyses.

It is almost impossible to establish, even by means of physical and chemical analyses, whether fine sand, which is the most common admixture in fine pottery, was intentionally added to the primary mass, or it was naturally present. Clay, especially so called

secondary clay, can naturally contain small-grained fine sand (Zlatunić 2005). Ethnoarchaeological data show that traditional potters prefer „already prepared“ clay, i.e. the clay which in natural conditions suits the potters' needs (for example, Gosselain 1992: 566; Arnold P.J. 1991b: 36; Stark et al. 2000: 305)<sup>2</sup>. Thus, pottery of fine fabric can be defined in two ways: as pottery with powdered mineral and/or organic admixtures and as pottery made of clay free of admixtures.

### Properties of fine pottery

Fabric, i.e. the raw material that a vessel is made of, has a serious impact on physical, mechanical and thermal properties of a finished vessel. Those properties include porosity, hardness, strength and thermal properties, which on their part affect performance characteristics of a finished vessel, i.e. its ability to adequately meet functional requirements. Fine pottery is made of clay free of admixtures or with powdered admixtures. Unlike vessels with a large quantity of organic admixtures in fabric, it shows very low porosity, which is additionally reduced by burnishing of surface and application of slip. In terms of function, this property can be an advantage if the vessel is used for liquid storage. On the other hand, low porosity affects thermal properties, because such vessels show poor resistance to sudden changes in temperature, which makes them unsuitable for thermal food processing.

An important property is hardness, which mostly has to do with resistance of material to mechanical stresses, i.e. abrasion. Great deals of archaeological ceramics show hardness between 2.5 and 4 on the Mohs scale (Bronitsky 1986: 222). Hardness depends on many factors (temperature and firing atmosphere, among the others), with porosity being one of the most important: finer, less porous material have higher hardness. Hardness is affected by treatment of surface. Neolithic fine pottery, along with fine fabric, also has finely burnished slip (the Starčevo pottery) or surfaces meticulously burnished often to a high sheen (the Vinča pottery). Such properties of internal and external surfaces also affect hardness: burnishing results in compacting of particles on the surface, which makes it harder and more resistant to abrasion; pottery with slip shows the same behaviour. Even without measuring by quantitative methods, hardness of pottery can be determined when the shape of a broken fragment is observed. Unlike vessels with coarse fabric which have uneven friable edges, fine vessels, as a rule, are broken into fragments of regular shapes and straight edges (Rice 1987: 355).

Strength of a vessel is also a property which shows resistance against mechanical stresses. Unlike hardness, which mostly refers to the behaviour of ceramic surface, strength has to do with the whole sample – a vessel (Rice 1987: 354). It results from a number of material properties – composition, physical properties, forming techniques,

<sup>2</sup> It should be noted here that this refers to the composition of raw material after separation, i.e. refining.

conditions of drying and firing, shapes of a vessel and wall thickness (Tite et al. 2001: 304). It is defined as the ability of a vessel to withstand various mechanical stresses without occurrence of cracks, breakage, deformation or abrasion (Bronitsky 1989: 590). Resistance to various mechanical stresses a very important property of ceramics when functions are being considered, especially functions of storage, transport, and thermal food preparation. Generally speaking, high hardness and strength are desirable properties of ceramic vessels, regardless of their function. Their importance is even bigger when use life of vessels and formation processes of pottery assemblage are considered (Neupert 1994: 709). Being more resistant to mechanical stresses, vessels with higher hardness and strength „live remarkably longer“ than porous, coarse vessels.

Fine pottery shows a high degree of hardness and strength on one hand, and low porosity on the other hand. Low porosity causes the following performance characteristics: low permeability<sup>3</sup>, on which burnished walls has an extra effect; good thermal conductivity<sup>4</sup> and low resistance to thermal shock (Sillar 2003: 175), high heating effectiveness<sup>5</sup> and low cooling effectiveness<sup>6</sup>. Based on these properties, fine pottery seems to be especially suitable for storage function, especially storage of liquids (low porosity), transport (resistance to mechanical stresses) and mechanical processing of food (high hardness and resistance to abrasion). On the other hand, those properties make it unsuitable for the function of thermal food processing (low resistance to thermal stress).

The issue of function, however, cannot be fully grasped without analyses of the formal properties of vessels. In addition to fine fabric and meticulously burnished surfaces, one of the most important characteristics of fine pottery is thin walls. Although many authors believe that strength of a vessel (Tite et al. 2001: 304) and impact resistance (Schiffer and Skibo 1987: 607) increase as wall thickness increases, those properties, in case of fine pottery, appear not to be of significant importance, since the vessels in question always have small dimensions. Furthermore, thin walls increase thermal conductivity and heating effectiveness (Braun 1983), cooling effectiveness and resistance to thermal shock (e.g., Rice 1987: 227). One might expect these walls to be common with vessels for thermal food preparation, yet archaeological and ethnographic data show the contrary: cooking pots with thin walls are almost unknown. Hence vessels for thermal food processing made in fine fabric and with thin walls seem unlikely to appear. Nevertheless, the functional analysis of Early Neolithic pottery has proven that such possibility may exist, which will be discussed below.

<sup>3</sup> Permeability affects circulation of gases and liquids through vessel walls, from the internal surface to the external surface and vice versa (Bronitsky 1986: 225).

<sup>4</sup> The rate or ease with which heat passes through ceramics under a particular temperature gradient (Rice 1987: 364).

<sup>5</sup> Heating effectiveness is the capacity of vessel walls to heat its content (Schiffer and Skibo 1987).

<sup>6</sup> Cooling effectiveness is a property opposite to the previous one: due to water evaporation through porous walls temperature drops, i.e. the content of vessel cools down (e.g. 604).



### **Position of fine pottery within ceramic assemblage**

In order to understand the total ceramic materials from one site and to compare them rightly to materials from other sites, it is not sufficient to calculate the total number of vessels and analyze the frequency of a particular type, kind or functional class within that number. In an analysis and interpretation, it is not sufficient to say that a specific type of vessels predominates and take it as a characteristic of a site, culture or one of its phases. On the contrary, the main question to which a researcher has to answer is *why that specific type dominates over the other types?*

Ceramic assemblage comes to existence through cultural formation processes, i.e. as a result of human activity in the course of a specific period of time. The issue of use-life of ceramic vessels seems to be critical for understanding of formation processes of ceramic assemblage. The subject of numerous ethnoarchaeological investigations has been ceramic census data, i.e. determination of the number of vessels that were in simultaneous use in a household (i.e. Kramer 1985: 89-92), as well as the time period in years in which each individual functional class was used (Arnold 1985: 152, table 6.2, 6.3). Generally speaking, vessels that are often handled and moved around are more prone to breakage, and consequently have a short use-life. Thus, as a rule, vessels for food and beverage preparation and consumption have the shortest use-life. On the other hand, storage vessels that have static position and aren't moved frequently have longer use-life. The dimensions of vessels, i.e. height, weight and volume, also play an important role in ceramic longevity (Shott 1996), so that the principle „the larger vessel, the longer life“ may be induced. Drawing on the results of ethnoarchaeological research, it is necessary to make an attempt to apply the knowledge gained in that area to archaeological materials.

### **Vinča pottery**

The statistic data concerning the frequency of individual pottery types were obtained during the 1999 to 2006 excavations at Vinča. Fine bowls of different types absolutely dominate in the pottery material, making 71% of the typologically assignable fragments. Their function has been determined on the basis of morphology and wall thickness; due to a complete lack of any traces of use, except occasional wear of the bottom, they have been undoubtedly attributed to the class of vessels designed for serving and consuming food. Thus, the results of the statistic analysis are consistent with the findings of ethnoarchaeological research. Bowls are used extremely often and are frequently manipulated. As a result of their frequent use, a high breakage rate occurs, while their use-life is very short. Once again the rule that smaller vessels have a shorter life is confirmed. The attempt to consider the total assemblage leads to the clear conclusion that a large quantity

of fine bowls cannot be explained by the possibility that Neolithic inhabitants may have produced only fine pottery, while other types of pottery were less favoured. Although we may assume that an equal number of fine bowls and other functional classes may have been used concurrently, bowls must have been broken more often, which resulted in a higher replacement rate for that particular class. Certainly, the consequence of the short use life of bowls was their high frequency in the total ceramic assemblage.

However, a remarkably bigger number of vessels, compared to other ceramic categories, deserves to be discussed in more detail. First of all, we must not absolutely reject other functions. Unfortunately, we can only suppose that fine pottery may have been used for short-time storage of some food, but the function of mechanical preparation of food and beverages should not be excluded either.

The high percentage of fine pottery frequency in Vinča may not only be a consequence of their short use–life. The fact that pottery fragments were to a high extent used secondarily for different purposes should not be neglected. The analysis of pottery material has shown that fragments of fine bowls were secondarily used as tools, probably in the process of ceramic vessel shaping (Vuković 2010b). Their properties, such as fine fabric, thin walls, burnished or polished surfaces and low porosity, as emphasized above, have an effect on high hardness of material and resistance to abrasion. This makes them especially suitable for tools. Therefore, we have to assume that broken vessels were not discarded, but fragments were kept for further secondary use. Storage of broken vessel fragments in the settlement or housing structures has been ethnoarchaeologically confirmed (Deal 1998). Therefore, in the investigations to come attention should be directed to identification of such places.

### **Starčevo pottery**

A completely different picture emerges when we look at the results of the statistic analysis of the Blagotin pottery. Fine pottery represented only by bowls makes no more than 6% of the total material (Vuković 2004). Although similar analyses of pottery from other sites are mostly lacking, it can be said that a low percentage of fine pottery share in the total material is a typical picture of pottery at other contemporary sites (for example Perić and Nikolić 2004: 182)<sup>7</sup>. Fine pottery is usually interpreted as luxury goods and its rare presence at the Early Neolithic sites is viewed as a result of undeveloped production technology. This view is wrong at best. Technological procedures related to production

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<sup>7</sup> According to their analyses, fine fabric pottery makes 12.5% of total material, which appears to be an unusually high percentage. However, 11% of pottery fragments is made in “fine fabric with organic admixtures” visible to the naked eye, while vessels with fabric in which coarse sand can be found along with organic admixtures make 0.5%. Having in mind recommendations that granulation of admixtures is the key to defining fabric, pottery with such big organic and mineral admixtures cannot be considered fine pottery at all. Thus, the percentage of fine pottery at Lepenski Vir is reduced to only 1%.

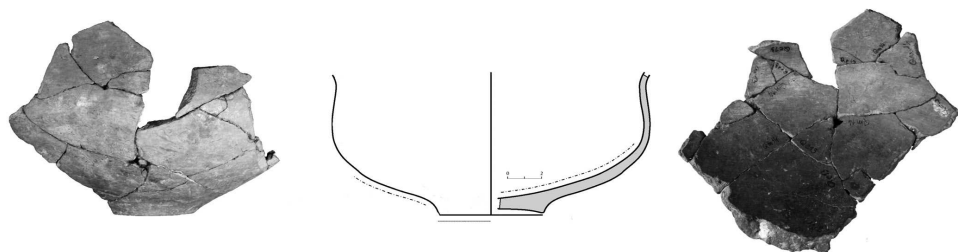
of large-sized vessels with coarse fabric are even more demanding; they require the potter's better experience and understanding of the way raw materials behave; shaping and firing processes last much longer and the risk of cracking during firing is higher (Vuković 2010b). In addition, fine pottery is, often tacitly, interpreted as a kind of pottery used for food and beverage consumption or high status display pottery. However, if low frequency of fine pottery is viewed from different perspective, taking into consideration frequency of use and use-life, completely different conclusions can be drawn. First of all, fine fabric, as we have demonstrated above, has an important effect on the strength of ceramic vessels, making them last longer and more resistant to mechanical stresses and damages. Furthermore, a low percentage of frequency indicates that this kind of pottery has a longer use-life than other kinds, which implies a lower frequency rate of its use. This leads to the conclusion that it may not have been used for serving and consuming food and drinks, which is the function securing a high percentage of frequency within the assemblage. Therefore, one may say that fine pottery is rare not because it was luxury goods which were difficult to obtain or were rarely produced, but because of its static function which did not expose it to the risks to which pottery in everyday use was exposed to. If we exclude serving and consuming purposes, then the question arises with respect to *the real purpose of the Starčevo vessels with fine fabric*. In order to provide a valid answer to this question, use-wear traces should be examined.

### **Early Neolithic fine pottery: Use-wear traces and function**

Although examination of physical properties can point to the suitability of ceramic vessels for specific purposes, the functional analysis of the Early Neolithic pottery has shown that the key indicators of functions are use-wear traces (Vuković 2006). The analysis was based on the identification of use-wear traces as well as on investigation into their distribution on the internal and external walls of vessels. At the beginning, it should be pointed out that there were samples of fine bowls where use-wear traces were completely lacking, yet the function of serving and consuming food and drink could not be excluded by any means. However, it was possible to identify a number of different use-wear traces, indicating perhaps completely different functions that this class of vessels may have had.

High hardness and strength of vessels, as well as low porosity, which are the main characteristics of fine pottery, make those vessels unsuitable for thermal processing of food. On the other hand, the experiments have confirmed that mineral admixtures in fabric, especially tiny particles of quartz, secure higher resistance to thermal shock, while increasing hardness at the same time (Kilikoglou et al. 1995). Three samples of fine bowls from Blagotin were noted to have use-wear traces indicating exposure of the vessels to fire. Namely, change in colour of external walls on the lower section of the ves-

sels is clearly notable. Gray colour could have resulted from uneven firing of the vessel, which would not be uncommon if the same pattern did not appear from the internal side. On the internal sides of the vessels, dark colour is even more intensive and is also limited to the lower section of the vessels, while it completely disappears in the shoulder section (fig. 2). Given the results of ethnoarchaeological and experimental research, there is no doubt that such changes in colour on both surfaces indicate exposure of the vessel to fire.



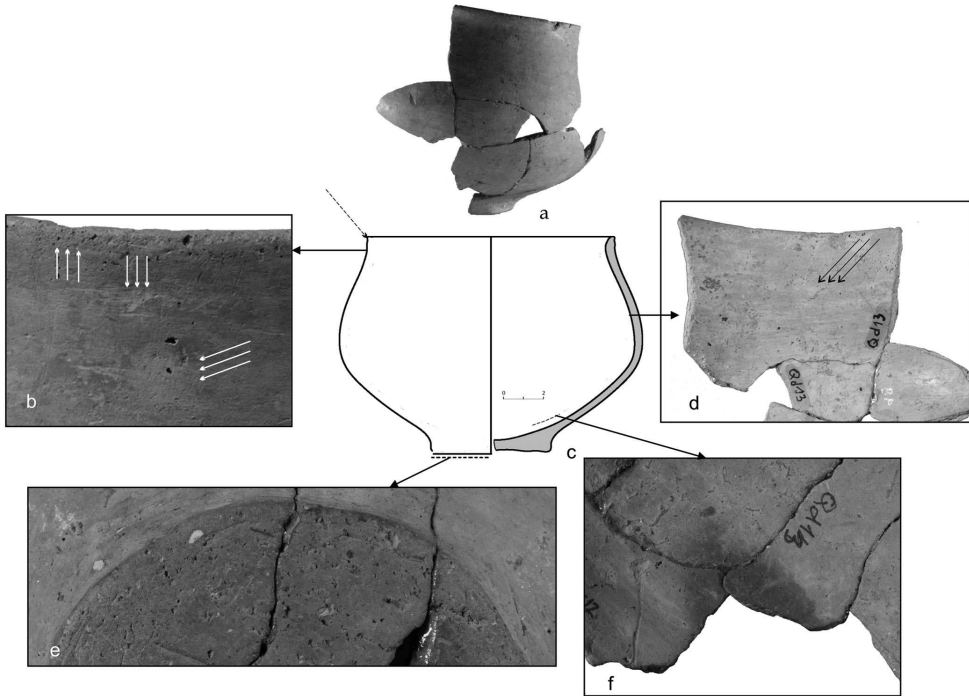
**Fig. 2** Fine bowl with use-wear traces indicating function of dry-mode heating

**Сл. 2.** Фина здела са траговима употребе који упућују на функцију излагања ватри без присуства воде

On external sides they appear as sooting clouds, while on internal sides they represent carbon deposits. Since no oxidation discoloration<sup>8</sup> is visible on the external walls, and dark stains cannot be rubbed out, the vessel is unlikely to have been exposed to open flame, but it must have been positioned at a certain distance above or beside the flame instead (Hally 1983; Skibo and Blinman 1999: 181). Carbon deposits occur through combustion of organic matters – food and its depositing on wall or in pores of ceramic vessels. Their distribution depends on a number of factors, among which the most important one is certainly the presence or absence of water in a vessel (Skibo 1992: 148-152). Carbon deposits at the bottom or in the lower section of the vessel results from exposure of food to a source of heat without presence of water; such a trace is left by roasting or heating seeds or some other kind of solid food, or by cooking of thick paste (Skibo and Blinman 1999). Besides, such traces can be created by heating grains in order to separate the chaff from the grain, which is a step preceding storage and preparation of food. This interpretation of use-wear traces on fine bowls is corroborated by the presence of barely visible mechanical damages in the form of notches, which could have appeared due to stirring of the vessel content. Another important fact should be emphasized: carbon deposits resulting from food thermal processing without water have not been noted in any other class of pottery. In spite of being identified with only three samples of fine bowls, at present we can say that it is the only kind of pottery designed for this purpose. Here

<sup>8</sup> Oxidation discoloration is a result of exposure of a part of a vessel to a high temperature and it is manifested in the form of stains of pale, beige, buff or orange colour. It usually appears on the lower parts of a vessel where sooting clouds are also visible. It indicates the position of the vessel in relation to the source of heat and appears at the spots where the temperature was highest (Hally 1983: 11-12).

we have to reconsider some characteristics of pottery behaviour. Since the pottery with minerals is much more suitable for exposure to a high temperature than the pottery with organic admixtures, it is possible that the need to achieve a high temperature led to the use of fine fabric vessels for this purpose. Unfortunately, without completed analysis of residues of the organic content it cannot be claimed with any certainty what kind of foodstuffs it was.



**Fig. 3** Fine bowl with abrasion and mechanical damage  
**Сл. 3.** Фина здела са абразијом и механичким оштећењима

A lone example of fine pottery is a fragment of a slightly biconical bowl with damages in the form of pitting on the internal walls, which can be attributed to the effects of non-abrasive processes, i.e. the process of fermentation. These use-wear traces are characteristic of other classes of pottery, medium-sized bowls with chaff in fabric (Vuković 2010a). The presence of surface pitting on fine pottery, however, can indicate that other types of pottery may have been used in this way.

The most common use-wear traces present on fine bowls are mechanical damages of different appearance and distribution. Along rims, across the whole width, abrasion can be noted (fig. 3/b), caused by mechanical contact with an abrasive that had higher

hardness than ceramics<sup>9</sup>. The conclusion can be made that such damages may have been caused by mechanical contact with a kind of a lid. Immediately below the rim, on the neck, notches parallel to the rim are often visible (fig. 3/b). They may have resulted from tying up a cover made of a soft material. Bottoms are usually worn (fig. 3/e), also due to mechanical contact with a hard material. The intensity of traces supports the hypothesis that vessels may have been used over a longer period. In many cases, intensive mechanical damages occur in the shoulder section (fig. 3/b) as a result of contact with a hard material, perhaps another vessel. In addition, it is not uncommon to find traces in the shape of horizontal incisions parallel to the rim, appearing on the internal side of shoulders of fine vessels (fig. 3/d). Those traces may indicate stirring of the content with some tool, which indicates the possibility that some fine bowls may have been multifunctional.

All kinds of use-wear traces have been detected on fine bowls from Blagotin, those resulting from exposure to a source of heat as well as those caused by non-abrasive processes. Mechanical damages should be pointed out in particular. The presence of abrasion, manifested by damaged slip and worn surface, has been noted on many rims. Notches on the neck, immediately below the rim, probably created by tying, often appear on the same fragments. Both kinds of traces indicate the possibility that the vessels could have been closed, which undoubtedly indicates the storage function. The first group of traces was created by physical contact with a lid of a hard material, while the other group was caused by tying in order to fix a cover of a soft material, cloth or leather. Since these vessels are always small in size, we can assume that food kept in small quantities such as seeds, dried herbs, etc. was stored there. Thus, the results of functional analysis lead us to two very important conclusions. First, it has been shown that fine bowls had a completely utilitarian role. Second, they have provided a possible answer to the low frequency of fine pottery in the total material. Given their storage function, fine bowls were in a static position inside the housing structure, which means that they were kept apart in a less accessible place and were not often moved. This leads to another conclusion that fine bowls had a longer use-life than other vessels and hence their small percentage in the total material.

### **Concluding remarks**

Neolithic fine pottery is represented by a distinctive group of ceramic finds made up of small-sized bowls of fine fabric, thin walls and finely finished surfaces. Although fine pottery from the Early and Late Neolithic is characterized by the same formal features, the difference in its function, and especially in the position within the ceramic assemblage, is remarkable. In the Early Neolithic, fine pottery occurs in an extremely low percentage. This phenomenon has been interpreted in the light of the static function

<sup>9</sup> When in contact with an abrasive of higher hardness and granulation than ceramic, the particles of admixtures in ceramics fall out leaving visible pittings at those spots (Schiffer and Skibo 1989).



of fine bowls and the low frequency of their use. In addition, the functional analysis has proved their utilitarian character and designed purpose for food storage, and somewhat less common, for thermal and mechanical processing. On the other hand, fine pottery of the Late Neolithic displays a completely different picture. Its extremely high frequency in the total material indicates a dynamic position of fine bowls, frequent use and manipulation, and consequently a high breakage rate and regular replacement of broken vessels with new ones. The absence of use-wear traces undoubtedly indicates their function of serving and consumption of food and drinks, which further supports the hypothesis of their short use-life. How can we explain such changes in the use of fine pottery?

The changes in the mode of use of fine pottery seem to be yet another indicator of differences in life-styles of the Early and Late Neolithic. The changes in pottery, which includes change of fabric and admixtures, as well as the function of ceramic vessels, undoubtedly indicate changes in the way of living and needs of population that was using them (Braun 1983). The transition to production of pottery with mineral admixtures and complete abandonment of practice of adding organic admixtures is a general feature of Vinča pottery. If we accept the explanation that pottery with organic admixtures in fabric characterized mobile communities, who „chose“ that kind of pottery in spite of its bad properties on the ground that it was lighter and hence easier to transport (Schiffer and Skibo 1987; Skibo et al. 1989), and thus it was characteristic of communities who while abandoning the economy based exclusively on hunting and gathering were adopting food production (Rice 1999), then we may assume that fine pottery might have been made only occasionally and for specific purposes. With the advent of sedentary life and an increase in population, adding of organic admixtures ceased, giving the way to ceramics with mineral admixtures that became generally accepted for all functional classes of pottery. Larger quantities of produced food could not be matched by small recipients and the utilitarian functions of fine pottery in the Early Neolithic were transferred to other, more suitable classes of vessels with bigger dimensions. Fine bowls in the Late Neolithic retained only one function – for serving and consumption of food and drinks. They were widely available to all community members, who often handled them, so that they were produced in larger quantities.

Consideration of a kind of ceramic material – fine ceramics - has revealed the need for changes in methodological approach and goals of pottery analyses, as they are often pursued in our archaeology. Descriptive, typological analyses remain useless unless accompanied by an attempt to explain statistically determined phenomena. The use-wear traces analysis points to the function of ceramic vessels, while investigation of mechanical and physical properties helps in determining their (un)suitability for specific purposes. When comprehensive analyses of chronologically and geographically varied assemblages have been made, it will be possible to discuss practices and the way of life of the Neolithic population with more certainty.

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ЈАСНА Б. ВУКОВИЋ

## ФИНА НЕОЛИТСКА КЕРАМИКА: ОСОБИНЕ, ПОНАШАЊЕ И ФУНКЦИЈА

### Резиме

Основни критеријум за идентификацију fine керамике представља fine фактура, па се она може дефинисати као керамика са јако уситњеним минералним и/или органским примесима и као керамика израђена од глине без додатих примеса. Групу fine керамике карактеришу исте формалне особине: то су зделе мањих димензија, танких зидова и fine обраде површина (глачане, полиране или са премазом). Основна физичка својства fine керамике су ниска порозност, велика тврдоћа и чврстина, које је чине изузетно отпорном на механичке притиске. Ове особине карактеристичне су и за керамику старијег и керамику млађег неолита. Разлике се, међутим, огледају у учесталости fine керамике у оквиру керамичког асемблажа, као и у њеној функцији. Fine зделе различитих типова у потпуности доминирају у керамичком материјалу финалног неолитског слоја из Винче и чине 71% типолошки одређивих фрагмената. Овако висока учесталост финих здела уклапа се у резултате етноархеолошких истраживања по којима посуде за конзумирање хране и пића, по правилу, имају најкраћи употребни век. Fine зделе се користе често, њима се много манипулише и стога се често ломе, па је њихов употребни век изузетно кратак. Учесталост финих здела у старијем неолиту је, међутим, знатно нижа. Fine керамика заузима свега 6% укупног материјала са старијенеолитског Благотина. Мала процентуална заступљеност говори о томе да ова врста керамике има дужи употребни век од осталих врста, што подразумева нижу учесталост употребе; њена функција је статична и она није изложена ризицима којима подлеже керамика у свакодневној употреби.

Анализа трагова употребе указала је и на различите функције fine керамике у старијем и млађем неолиту. Функција винчанских здела одређена је само на основу морфологије и дебљине зида; с обзиром на то да на њима у потпуности недостају било какви трагови употребе, осим понекад истрошености дна, није било велике дилеме у погледу њихове атрибуције класи посуђа за сервирање и конзумирање хране. На финим зделама са Благотина идентификоване су све врсте трагова употребе, како оне настале излагањем извору топлоте, тако и оштећења настала деловањем неабразивних процеса. Посебно треба истаћи механичка оштећења. На већем броју обода утврђено је присуство абразије, која се манифестује оштећеним премазом и истрошеном површином. Чест је случај да се на истим фрагментима појављују урези на врату, непосредно испод обода, који су вероватно настали везивањем. Обе врсте трагова указују на могућност да су посуде биле затваране, што недвосмислено указује на функцију складиштења. Прва група трагова настала

је физичким контактом са поклопцем од тврдог материјала, док је друга настала везивањем, како би се причврстио покривач од неког меког материјала, тканине или коже. С обзиром на то да се увек ради о посудама малих димензија, можемо претпоставити да су се у њима складиштиле намирнице које се чувају у малим количинама, као што су семенке, сушено лековито биље и слично. Резултати функционалне анализе нас, дакле, наводе на два веома важна закључка. Прво, показало се да fine зделе имају сасвим утилитарну улогу. Друго, дали су могући одговор на ниску учесталост fine керамике у оквиру целокупног материјала. С обзиром на функцију складиштења, fine зделе су имале статичан положај у оквиру стамбеног објекта, што значи да нису често померане и да су вероватно биле смештене на неком издвојеном, мање доступном месту. Разлике у функцији fine керамике у старијем и млађем неолиту могуће је објаснити променом потреба становништва, до које је дошло преласком на потпуно седелачки начин живота, повећањем популације и потпуним овладавањем земљорадњом. Старији неолит карактеришу органске примесе у факури, а fine керамика са минералним примесама вероватно је била израђивана само повремено и за специфичне потребе. С почетком изразито седелачког живота и повећањем популације, додавање органских примеса престаје, а керамика са минералним примесама постаје општеприхваћена за све функционалне класе посуђа. Већа количина произведене хране више не одговара малим рецепијентима и утилитарне функције fine керамике старијег неолита прелазе на друге, погодније класе посуђа већих димензија. Fine зделе у млађем неолиту задржавају само једну функцију – за сервирање и конзумирање хране и пића, а широко су доступне и производе се у већој количини.

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