

THE MEDIEVAL CERAMIC SEQUENCE FROM NOVIODUNUM

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Abstract: Excavations at Noviodunum, Tulcea, conducted by the Noviodunum Archaeological Project have recovered large quantities of medieval ceramics from a sequence of stratified deposits. These ceramics have been quantified by fabric, form and context. By characterising the ceramics by fabric, and then assessing the frequency of these fabrics through the stratigraphic sequence, it is possible to reconstruct the relative sequence of ceramic production and supply. When combined with other aspects of the excavated materials, such as coins and ¹⁴C determinations, absolute dates can be suggested. This paper provides the preliminary results of this analysis.

Rezumat: Cercetările întreprinse în cadrul Proiectului Arheologic Noviodunum (NAP) au condus la înregistrarea unei mari cantități de ceramică medievală provenită din contexte arheologice bine stabilite. Acest lot a fost cuantificat ținând cont de modul de fabricare, forma recipientelor și context, încercându-se reconstituirea modului de aprovizionare a sitului cu ceramică, atât prin producție locală cât și prin import. Lucrarea reprezintă un stadiu preliminar al acestor investigații care au fost coroborate și cu date cronologice absolute furnizate de descoperiri monetare și datări ¹⁴C.

Key words: Noviodunum, medieval, pottery, fabric, stratigraphy, dating

Cuvinte cheie: Noviodunum, ev mediu, ceramică, stratigrafie, datare

Introduction

Excavations at Noviodunum, as part of the Noviodunum Archaeological Project, have recovered a large assemblage of medieval pottery: 45,844 sherds weighing over 600 kg. Analysis of the material is ongoing and a full report on the pottery will appear in the excavation report¹. The aim of this paper is to summarise the ceramic sequence as it is currently understood and to present the dating and stratigraphic evidence supporting it. One of the aims of the project was to produce a ceramic sequence for the region and to use this to assess those in place, which are largely based on excavations at sites such as Capidava and Dinogetia, carried out before the advent of modern excavation techniques and scientific dating methods. A brief summary of the archaeology and history of Noviodunum is presented along with a methodology, before a summary of the pottery by phase. As well as providing a ceramic sequence, the paper presents an interim characterisation of the wares present.

The Noviodunum Archaeological Project

The fortress at Noviodunum, situated on the edge of the modern small town of Isaccea, dominates one of the main crossing points of the lower Danube. As a result there are Roman, late Roman, Byzantine, Ottoman and 20th century defences on the site creating a rich, deep and complex palimpsest of deposits. An overview of work on the site and the extant remains is not

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¹ Lockyear, Popescu and Sly forthcoming.

within the purview of this paper². In the late Byzantine period, beginning with the reconquest of the Danube frontier in 971 by the armies of John I Tzimisce (963-969) and consolidated by Basil II (976-1025)³, Noviodunum was refortified. The dating is clearly indicated by the coinage evidence⁴ as well as a lead seal from Isaccea⁵. The Byzantine settlement occupied the promontory previously used by the Roman fortress and an area immediately outside the walls. Slightly further to the south the area formerly occupied by the Roman extra-mural settlement was used as a cemetery. We have shown that the „outer defences” originally mapped by Ștefan⁶ are natural erosion features⁷. Byzantium’s hold on this region was hugely weakened when Constantinople was sacked by the Fourth Crusade in 1204⁸. From the eastern side of the fortress burials have been radiocarbon dated to 1170-1290 cal AD (context 1027, two standard deviations, SEURC 28305) and 1040-1100, 1120-1270 cal AD (context 1768, two standard deviations with 1040-1100 having a probability of 11.9% and 1120-1270 having a probability of 83.5%, SEURC 28312) indicating that this area at least was given over to burial, most probably in the 13th century. The plentiful coins of the 13th century⁹ clearly show the continued use of the site at this time.

The Noviodunum Archaeological Project undertook fieldwork at the site and in the hinterland from 2000 to 2010. Four preliminary seasons of topographic, pick-up and electrical resistance survey were undertaken between 2000 and 2004 and have been reported previously in this journal¹⁰. Six seasons of excavation were then undertaken on the fortress (2005-2010, mainly Areas 1 and 1.7), the Byzantine cemetery (2006-2008, Area 2) and at sites in the hinterland including Poșta (2007, Area 3), Isaccea–*Suhat* (2008, Area 4) and Parcheș (2009, Area 5). Seven seasons of field walking were also undertaken in the hinterland (Spring and Summer 2006-2009), along with the analysis of satellite imagery and aerial photography and selected geophysical survey including magnetometry and ground penetrating radar. The project has now entered its post-excavation phase and the production of the final project monograph is underway.

NAP had a number of distinct aims, one of which was to examine the means by which the Roman, Romano-Byzantine and late Byzantine fortresses were provisioned including the interaction of the fortress with its hinterland. To this end an extensive programme of soil sampling was undertaken, large quantities of animal and fish bone have been examined and the ceramic assemblages analysed. Virtually all excavated deposits were dry-sieved to ensure maximum possible retrieval of artefacts and ecofacts. As part of this aim, the construction of a fabric series for ceramics from the site based on the stratigraphy was essential.

NAP adopted the Museum of London recording system¹¹. In this system every unit of record (‘context’) is given a unique number including both cuts and fills. Obviously, a single cut may contain one or more fills. Hence a single pit, for example, will be recorded via several context numbers although for brevity it is usually referred to by its cut number alone. In the

² Baumann 2004, 2010.

³ Stephenson 2000, 51-53.

⁴ Lockyear *et alii* 2005-2006, 138.

⁵ Madgearu 2007, 39.

⁶ Ștefan 1973.

⁷ Lockyear *et alii* 2005-2006, 124.

⁸ Stephenson 2000.

⁹ Lockyear *et alii* 2005-2006, 139.

¹⁰ Lockyear *et alii* 2005-2006.

¹¹ Westman 1994.

text below context numbers referring to layers and fills are within round brackets () and cuts such as pits and grave cuts are within square brackets []. The stratigraphic sequence is then graphically represented via a Harris matrix¹². By inserting into the matrix independent dating evidence such as coin dates and radiocarbon determinations, and then reading up or down the diagram¹³, it is possible to assess the likelihood of erroneous dates given by residual material¹⁴. Such rigorous stratigraphic analysis is not possible on-site and the resultant relative and absolute dating is only becoming clear during the post-excavation phase. Dating at Noviodunum is made more difficult by bioturbation caused by the burrowing of susliks. For example, the edges of pits and walls were often defined by concentrations of suslik burrows. As a result, we have had to take the overall pattern into account and allow for contamination of the finds assemblage.

Methodology

The aims of the analysis of the medieval pottery at Noviodunum were to create a dated type series of fabrics and forms for use in the dating of the site and discussions of economy, as well as to provide a resource for other researchers working in the area. Sherds were divided into fabric groups based on the principal inclusions present¹⁵ and then by form and decoration. Form and decorative techniques and motifs are classified using the terminology defined by the Medieval Pottery Research Group (MPRG 1998) where possible. The material was then recorded onto a specially designed Microsoft Access database for storage and interrogation. In accordance with the minimum standards for the recording of post-Roman pottery outlined by the Medieval Pottery Research group (MPRG 2001), pottery was quantified by sherd count and sherd weight, as well as by rim percentage, to permit the calculation of *Estimated Vessel Equivalents* (EVEs)¹⁶. Quantitative analysis has allowed us to contrast the quantities of particular types present, for example allowing us to consider differences in the forms produced by particular workshops, or to compare the quantities present in particular archaeological deposits. Much of the excavated material is highly fragmented and therefore sherd weight has been used in this paper to account for this, as in some contexts the pottery consists of a few large sherds, whereas in others it consists of a larger number of smaller fragments. Fragmentation has been measured by calculating the mean average sherd weight, which allows us to consider whether some material (represented by highly fragmented sherds) may be residual and therefore pre-date the deposit being considered.

A total of 49 locally produced coarseware fabrics were identified and these have been grouped into 9 ware groups, which are summarised below. The groupings are principally based on petrological analysis, but firing atmosphere, texture and other areas of technology have also been considered. Analysis of the stratigraphic sequence has allowed us to identify several sequences of intercutting features, some of which can be dated on the basis of numismatic evidence, the presence of imported pottery or radiocarbon dates. The presence of these wares through the stratigraphic sequences has allowed us to create a ceramic sequence, which has been dated based on the dates suggested by these other strands of evidence. On the basis of this, 4 ceramic phases have been identified, with groups which commonly occur together being deemed to be contemporary with one another¹⁷.

¹² Harris 1989.

¹³ Harris, Reece 1978-1979.

¹⁴ Lockyear forthcoming.

¹⁵ following Orton, Vince, Tyers 1993, 236.

¹⁶ see Orton, Vince, Tyers 1993, 171.

¹⁷ see Vince 1985.

The Ceramic Phases

The ceramic phases can be summarised as follows:

Phase 1: 10th–11th Century

Phase 2: 11th–12th Century

Phase 3: Late 12th–13th Century

Phase 4: 14th–15th Century

The stratigraphic and chronological basis for the definition of each phase is presented, followed by a basic characterisation of the pottery present in each phase.

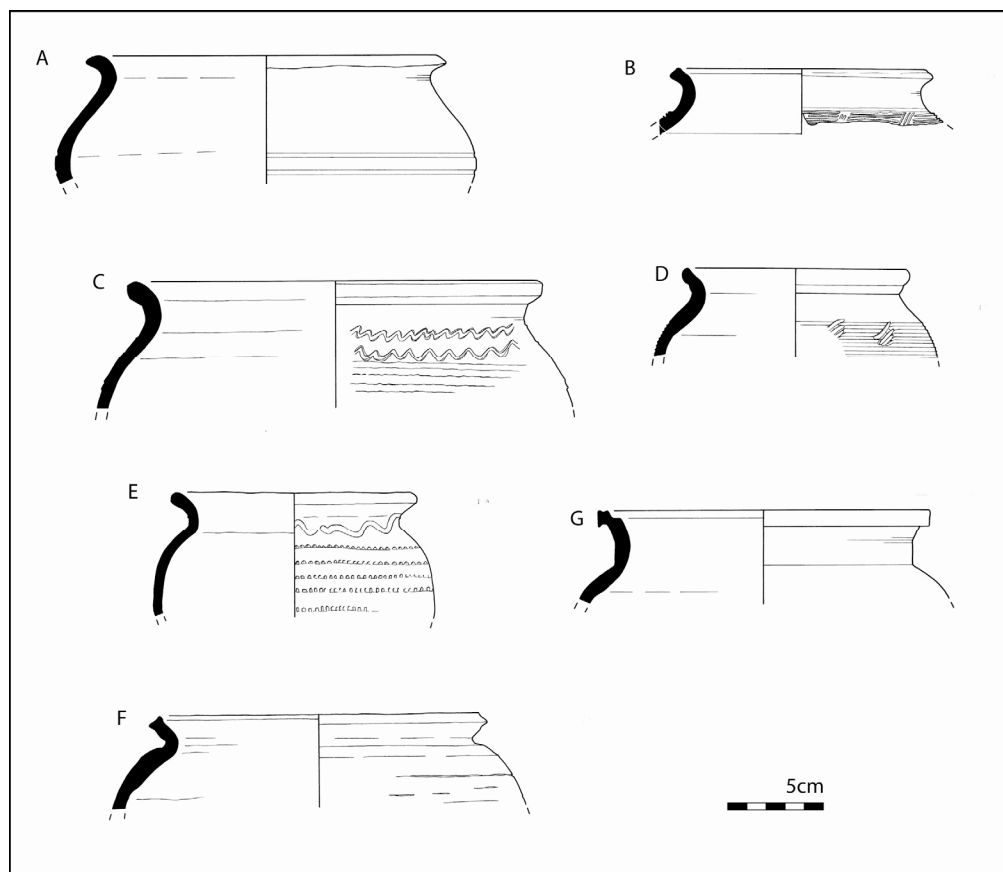


Fig. 1. Typical pottery from Noviodunum. A). Early Quartz-tempered Ware; B). Early Sandy Ware; C). Oxidised Sandy Ware; D). Buff Limestone-tempered Ware; E). Reduced Sandy Ware; F). Schist-tempered Ware; G). Well-fired, Wheelthrown Ware.

Drawings: Frances Saxton.

Ceramic Phase 1 (10th–11th Century)

The earliest medieval deposits can be found in Area 1.7, where a series of collapsed layers were excavated dating to the 10th-11th century, on stratigraphic grounds (1755). Three wares are typical of this phase; Early Quartz-tempered Ware (EQT), Early Sandy Ware (ESW) and Red Painted Ware (RPW). The layers underlying context (1755) (contexts 1775 and 1788) have a distinctive ceramic assemblage which can be dated to the 10th-11th century, on the basis of this coin date. The assemblage from this deposit is dominated by Early Quartz Tempered Wares (64% by weight) and Early Sandy Ware (10% by weight) (Fig. 2A). A similar range of wares are present in the mortar collapse layer which overlies context (1755), contexts (1774) and (1777). In this deposit the Early Quartz Tempered Wares account for 40% by weight with Red Painted Wares being the next most common type (13%) (Fig. 2b). This deposit is cut by pit [1726] which contains an assemblage typical of phase 2.

The wares present in this phase find parallels at Capidava¹⁸, where it is suggested that although these wares may be influenced by types produced in the 5th-6th centuries, they continued to be produced into the 11th century. Similar wares are present at Dinogetia, where they are also dated to the 10th-11th centuries¹⁹. The wares can be summarised as follows:

Early Quartz-tempered Wares (EQT)

Fabrics are heavily tempered with quartz, with other inclusions largely being derived from sand, which may have been added as temper. The colour of these fabrics ranges from a buff/white to grey. Petrological analysis indicates that these were produced at a range of production centres, with some fabrics seemingly originating from an area of metamorphic geology, perhaps in the Măcin Mountains to the west of Noviodunum, or the outcrops close to Tulcea. Other fabrics do not have a heavily micaceous groundmass, but were tempered with micaceous sands, similar to those present on the bank of the Danube at Noviodunum, indicating that they may have been produced locally. The most common vessels produced in these fabrics are jars (*e.g.*, Fig. 1A), although a small quantity of bowls were also present. The jars principally have simple, everted rims, with either a rounded or straight edged profile, with these differences appearing to relate to the different fabrics (and therefore production centres) identified. Decoration is rare, but the most common motifs are incised horizontal or wavy lines.

Early Sandy Wares (ESW)

These wares are considerably finer than the Early Quartz-tempered Wares. Two variants are present in the group, one with white surfaces (fabric 106) and one with pink surfaces (fabric 206). Petrological analysis suggests these wares were produced close to Noviodunum, with the fabrics being characterised by a micaceous, silty groundmass and sedimentary inclusions. As with the Early Quartz-tempered Wares, the sherds are principally from jars, usually with simple, everted rims, with rounded profiles. The vessels are decorated in a similar way, with incised horizontal or wavy lines (*e.g.*, Fig. 1B). A small number are rouletted. These wares fit into Dinogetia group 2a²⁰, similarly dated to the 10th-11th centuries.

¹⁸ Florescu *et alii* 1958, 169.

¹⁹ Ștefan *et alii* 1967.

²⁰ Ștefan *et alii* 1967.

Red Painted Wares (RPW)

This tradition is well defined both in the region and also further afield, in southern and northern Europe in the early medieval period²¹. It was not possible to source the wares present at Noviodunum, although one sherd bears some similarity to Pingsdorf Ware, produced in Germany in the 10th–11th centuries. Sherds are generally cream or off-white in colour and decorated with a painted red slip. Similar wares were present at Dinogetia (Group 2b), where they are believed to date to the 10th century²².

Ceramic Phase 2 (11th–12th centuries)

The majority of the pottery excavated at Noviodunum fits into this phase. There are two locally produced wares; Oxidised Sandy Ware (OX) and Buff, Limestone-Tempered Ware (BLT). A number of imported types, including Clear Glazed and Green Glazed Whitewares (MGW) and Slipped Redwares also fit into this phase. A highly fired, reduced glazed ware is also present in deposits of this date (HFGW). This has been identified at Dinogetia, but its source is unknown. The dating of the local wares is confirmed by a series of radiocarbon dates, numismatic evidence and the presence of imported pottery of known date. For example, the fills of pit [1088] can be dated to the mid 13th century at the latest, on the basis of a radiocarbon date from burial [1039] (AD 1170-1290) and the fact that this grave is overlain by a layer containing a 13th century coin (a small module type A, Latin imitation, dated to after 1204). The pottery assemblage from this pit is dominated by Buff, Limestone-tempered Wares (67% by weight) and Oxidised Sandy Ware (27% by weight). Two small sherds of Green Glazed Whiteware are also likely to be contemporary (Fig. 2C).

Two further pits, [1205] and [1240] clearly pre-date the 13th century as they are cut by pit [1036], which contains a 13th century coin and typical 12th century imports, including Clear Glazed Whiteware and Green Glazed Whiteware (dated to the 10th-12th centuries) and Incised Sgraffito Ware, typical of the 12th-13th centuries. The assemblage from pit [1205] is dominated by Oxidised Sandy Ware (63% by weight in the primary fill) and Buff, Limestone-Tempered Ware (29% by weight in the primary fill) (Fig. 2D). Context (1214) in pit [1240] is characterised by the presence of a number of large, joining sherds, with Buff, Limestone-Tempered Ware being most common (71% by weight), followed by Oxidised Sandy Ware (28% by weight) (Fig. 2E).

A further pit, [1273], contained an 11th century coin. The bulk of the pottery consists of Buff, Limestone-tempered Ware (64% by weight) and Oxidised Sandy Ware (29% by weight) (Fig. 2F). There is only a small quantity of Phase 1 wares, suggesting that they ceased to be produced by the late 11th century. This transition can be seen more clearly in the sequence from Trench 1.7. Pit [1726] cut the phase 1 layers discussed above. The pottery from the primary fill of this pit (1711) is dominated by Oxidised Sandy Ware (87% by weight), with Early Sandy Ware accounting for the remaining 13% (Fig. 2G). This pit is cut by pit [1723]. Again, the primary fill is dominated by Oxidised Sandy Ware (64% by weight), with Buff, Limestone-Tempered Ware being the next most common type (24% by weight) (Fig. 2H).

²¹ Hurst 1969.

²² Ștefan *et alii* 1967.

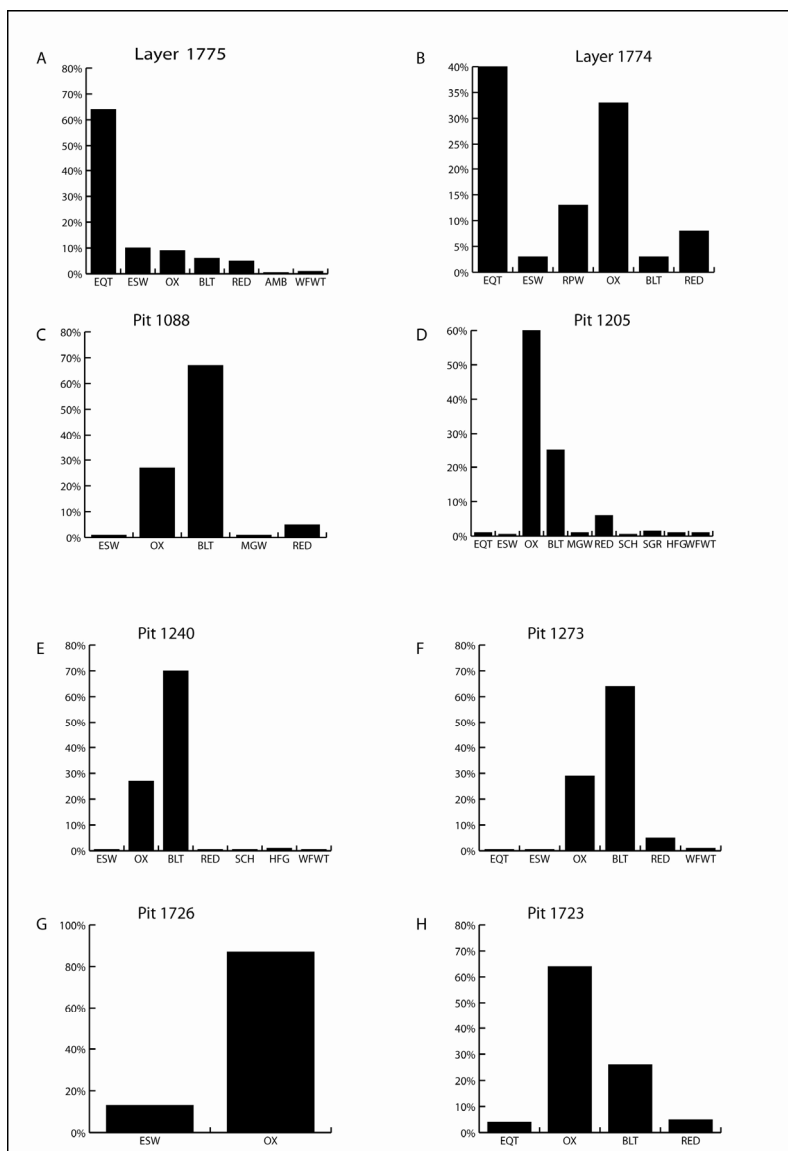


Fig. 2. Composition of selected phase 1 and 2 assemblages from Noviodunum by sherd weight (g) (excluding Roman pottery and amphorae).

On the basis of the numismatic evidence it can be demonstrated that phase 1 pottery went out of use in the 11th century. The phase 2 wares certainly continued in use into the 12th century, but the assemblages from features dated to the 13th century have a noticeably different composition. The dating of these wares corresponds with that from other sites, both within the

region and further afield. At Capidava, for example, the 10th-11th century pottery is characterised by the continued presence of jars with incised decoration, but with coarser, sandier fabrics than in earlier periods²³. This corresponds well with the developments in the Noviodunum assemblage. The form of these vessels closely matches 'Slavic' types, even those from as far north as Novgorod (Russia)²⁴. This is both in terms of form, with jars having flat bases and everted rims, but also the presence of incised wavy and horizontal line decoration. Similar pottery is dated to the 'Slavic' period at Nicopolis ad Istrum²⁵.

Oxidised Sandy Ware (OX)

This group have a sandy fabric and are oxidised. Petrological analysis suggests that most of these fabrics were locally produced, either in the area immediately around Noviodunum, or around Tulcea. It is possible that one fabric (122), which is by far the most common type, was produced at Noviodunum for consumption there. A small number of vessels appear to have come from further south, as their fabrics are characterised by limestone inclusions, matching closely with the geology of central Dobrogea. Most of the identified vessel forms are jars, but bowls, lamps, jugs and cauldrons were also present. Jars typically have flat bases with simple, everted rims, with a rounded profile. (e.g., Fig. 1C). Despite the difference in fabric, the jar forms suggest some continuity from earlier forms. Decoration is generally in the form of incised horizontal and/or wavy lines. A small number of sherds are stamped or rouletted. The wares fit into Dinogetia group 2a, a range of sandy wares which date to the 10th-11th centuries, this matches with the dates suggested here, although the numismatic evidence from Noviodunum suggests that they continued to be produced into the 12th century.

Buff, Limestone-tempered Ware (BLT)

These fabrics are buff in colour and are typified by limestone Inclusions. Petrological analysis suggests that most of the vessels can be sourced to the Tulcea area, although the calcareous clay of some fabrics indicated a source further south. There is less variability in vessel type than amongst the Oxidised Sandy Wares, only jars and a small number of bowls were identified. The jars are of similar form to the Oxidised Sandy Ware vessels, and a similar range of decorative motifs are present (e.g., Fig. 1D). These wares fit into Dinogetia group 5, dating from the mid 11th to mid 12th century, which consists of wares tempered with limestone and shell and decorated with incised decoration²⁶. This matches closely with the dating at Noviodunum and it is possible that similar wares were produced in the Dinogetia area as part of this tradition.

Imported Wares

A range of imported wares fit into this phase. Clear Glazed and Green Glazed Whitewares, possibly Constantinopolitan types, are present, generally in the form of bowls or dishes, although more unusual forms are present, including chafing dishes and a bottle. Redwares with a white slip and green or clear glaze, designed to imitate these whitewares, are

²³ Florescu *et alii* 1958.

²⁴ Goryunova 2006.

²⁵ Poulter 1999.

²⁶ Ștefan *et alii* 1967.

also present and these can be dated to the 11th-12th centuries²⁷. There are also a small number of highly fired, reduced glazed wares. Petrological analysis suggests a small quantity of these could have been locally produced, but the majority would appear to have been imported. Contemporary highly fired glazed wares are present at Pliska and Novae in Bulgaria, so this could be one source.

Phase 3 (12th to mid 13th Centuries)

The distinction between phases 2 and 3 is less clear than that between phases 1 and 2. In fact, the phase could probably be divided into 2 sub-phases, the first being characterised by a steady decrease in the proportions of phase 2 wares in relation to Reduced Sandy Wares (RED) and a wider range of imported wares and the second by the presence of a range of particularly coarse Shale-tempered (SHA), Schist-tempered (SCH) and Shell-tempered Wares. One reason for the difficulties in defining this phase is the large quantity of redeposited phase 2 material present in contexts of 13th century (or later) date. Analysis of the levels of fragmentation demonstrates that much of the earlier material is redeposited, as sherds of these wares are considerably smaller than the sherds of the phase 3 types.

Pit [1055] is typical of a feature dating to the earlier part of this phase. It is sealed by a layer containing a 13th century coin. Although Oxidised Sandy Wares are the most common type by weight (49%), followed by Buff, Limestone-tempered Ware (25%), there is a sizeable proportion of Reduced Sandy Ware (14%) (Fig. 3A). The pit is overlain by layer (1014) which contains a 14th century coin. The pottery consists of phase 3 types (59% by weight), but also sherds of Reduced Sandy Ware (14%), Shale-tempered Ware (14%), Schist-tempered Ware (4%) and a small quantity of later material (Fig. 3A).

The material from pit [1055] demonstrates that the transition into phase 4 may have started in the late 12th century. A small number of pits can be securely dated to the 13th century, on the basis of numismatic evidence. One of these is pit [1316]. The primary fills of this pit contained little pottery, but one fill (1079) contained a relatively large group, along with a 13th century coin. The pottery from this deposit is principally Oxidised Sandy Ware (60% by weight). Several other ware types are present; Buff, Limestone-tempered Ware (17%), Reduced Sandy Ware (8%), Shale-tempered Ware (1%) and Coarse Shelly Ware (2%), as well as imported types. The sherds of Shale-tempered Ware and Coarse Shell-tempered Ware are considerably larger than the fragments of Oxidised Sandy Ware, Buff, Limestone-tempered Ware and Reduced Sandy Ware, suggesting perhaps that some of these sandier wares are residual or redeposited. Therefore, we can see that by the 13th century the coarser wares were rising to prominence, at the expense of the earlier sandy wares. The 13th century date of the filling of this pit is confirmed by the presence of Zeuxippus-type Ware and Green and Brown Painted Ware, however there are a number of small fragments of earlier glazed types, demonstrating that at least some of the phase 2 local products are likely to be residual or redeposited.

The best evidence for the transition to phase 3 comes from Area 1.7 For example, pit [1727], which had a single fill, (1701), was filled with a mixture of phase 2 wares, with Oxidised Sandy Ware (61% by weight) and Buff, Limestone-tempered Ware (12%) being present, alongside Reduced Sandy Ware (9%) (Fig. 3C). The next pit in the stratigraphic sequence, [1385] contained 12th-13th century coins, as well as Oxidised Sandy Ware

²⁷ Dark 2001, 125-126.

(61% by weight) , Buff, Limestone-tempered Ware (13%) and Reduced Sandy Ware (10%). There are also small quantities (1% or less) of Shale-tempered Ware, Schist-tempered Ware, Green and Brown Painted Ware and Incised Sgraffito Ware (SGR). The presence of these glazed wares corresponds with the numismatic evidence. Therefore, it is possible, on the basis of these pits, to argue for a slow adoption of Reduced Wares through the late 12th and early 13th centuries, before they are replaced by the coarser reduced wares. A sunken featured building (context [1793]) contained a mixture of material and was likely filled with redeposited waste, including sherds of Shale-tempered Ware, Schist-tempered Ware and Coarse Shell-tempered Ware, as well as coins of which the latest date to the 13th century. It seems then, that the transition to these coarser wares occurred at some point in the 13th century.

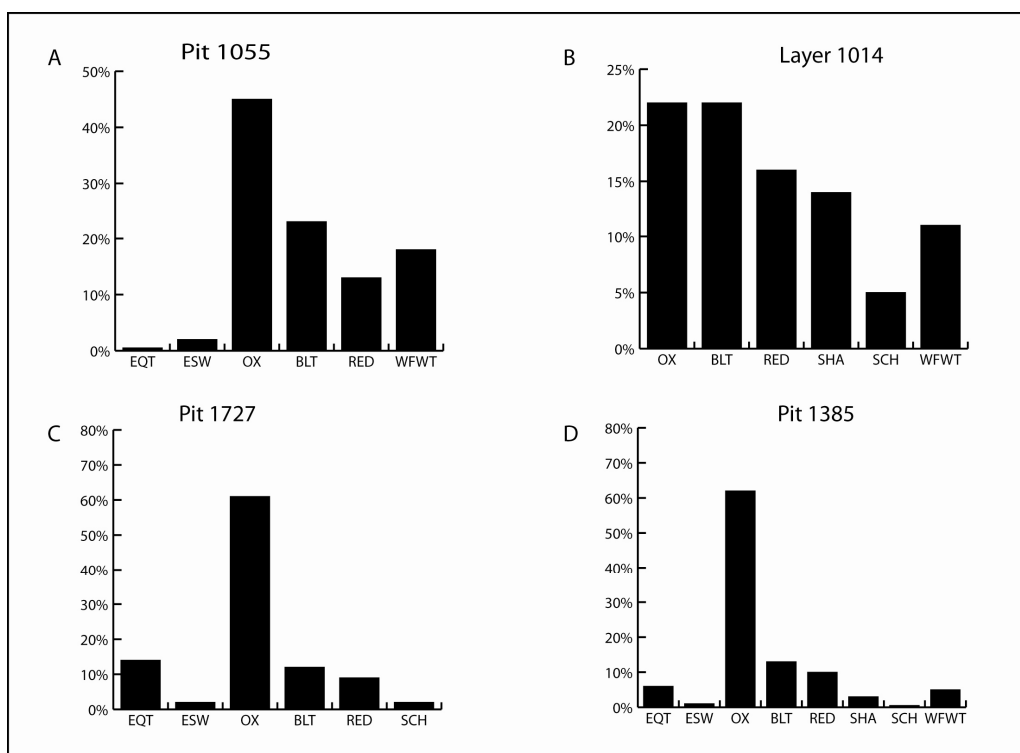


Fig. 3. Composition of selected phase 3 assemblages from Noviodunum by sherd weight (g) (excluding Roman pottery and amphorae).

Reduced Sandy Ware (RED)

These wares are differentiated from the Oxidised Sandy Wares on the basis of colour, with surfaces ranging from grey-black. A range of sources are represented. Whilst petrological analysis demonstrates that some were produced locally, there are also fabrics present which contain inclusions typical of the geological region to the west of the site, towards the Măcin Mountains.

The vessel forms are similar to those in the Oxidised Sandy Wares, with jars being most common, and typically having simple, everted rims, either with a rounded or squared profile (Fig. 1e). The decorative motifs do differ however; rouletting is more common on these wares than the oxidised wares, but the principal decorative motifs remains as horizontal and/or wavy lines around the vessels. These wares were not identified as a distinct type at Dinogetia²⁸. Instead they fit into the group 2 sandy wares with incised decoration. The continued presence of these wares in later deposits at Noviodunum suggests that the sandy ware tradition persists longer than suggested at Dinogetia, perhaps lasting into the 13th century.

Shale-tempered Wares (SHA)

Vessels in these fabrics are generally reduced, handmade and are characterised by abundant shale inclusions. Based on the character of the shale, the fabrics are likely to derive from two regions, the Măcin Mountains or central Dobrogea. It is possible, on the basis of other inclusions, that both sources are represented, or that these fabrics derive from more distant sources. What can be suggested is that like the Reduced Sandy Wares, these fabrics appear to derive from the west of Noviodunum and form a part of a reduced, coarse, ceramic tradition. Jars are the only identifiable vessel forms. There are very few rims present, but simple, everted rims with rounded and straight edged profiles are present in equal quantities. Only a few sherds are decorated.

Schist-tempered Wares (SCH)

These fabrics are handmade and highly micaceous, with abundant inclusions of quartz-mica schist. They can be sourced to the Măcin Mountains, on the basis of having a heavily micaceous clay body and metamorphic inclusions (angular schist and amphibolites) or sedimentary fragments of types found in this area (sandstone and limestone). It is feasible that the source for these wares could actually lie in the metamorphic outcrops in Ukraine. The only forms identified were jars, with rims generally being simple, everted forms (Fig. 1F). Horizontal lines are the most common decorative motif.

Coarse Shell-tempered Ware

A single shelly ware fabric is present, sourced to the west of Noviodunum. Several of the sherds come from a single vessel, a cauldron.

At Dinogetia the shale, schist and coarse shelly wares are grouped together as group 4, handmade vessels with rock temper. Here they are dated to the 10th-11th centuries, being replaced by group 6 (coarse sand tempered shelly wares) in the 12th century. The Noviodunum evidence suggests that this tradition overlaps with the sandy ware traditions and that it may be longer lived than was suggested at Dinogetia. This is on the basis of one large secure group of these wares and their presence in the upper part of the stratigraphic sequence, indicating their introduction to the site in the 13th century.

Imported Wares

A wide range of imported wares are present which date to the 12th-13th centuries²⁹. It is probable that, as they fulfilled functions related to a Byzantine lifestyle and they can generally be sourced to the Byzantine world, that these belong to the earlier part of this

²⁸ Ștefan *et alii* 1967.

²⁹ see Dark 2001; Vroom 2003.

phase. These include Yellow Glazed Whitewares, Green and Brown Painted Ware and Incised Sgraffito Wares. It is possible however that trading connections continued into the 13th century, and this is supported by the presence of Zeuxippus-type and Corinth-type Sgraffito wares, dating to phase 4.

Phase 4 (14th–15th Centuries)

No contexts can be securely dated to this phase, but small quantities of wares of this date are present in the latest deposits at Noviodunum. For example, small quantities were recovered from the Sunken Featured Building [1793] and from the pits which cut this feature. These include Well-fired, Wheelthrown Ware and some glazed wares, of possible local origin. Similar types have been observed by the author in collections from Enisala and were also identified at Păcuil lui Soare, where well fired jars, often with strap handles, are dated to the 13th–15th centuries³⁰. A detailed discussion of deposits containing these wares is not appropriate as none are present which can be firmly dated to this phase.

Well-fired, Wheelthrown Wares (WFWT)

All of the fabrics in this group are wheelthrown, oxidised and were fired to a higher temperature than earlier wares. They appear to represent the latest locally produced earthenware in the assemblage. On petrological grounds two sources can be suggested, an area of sedimentary geology, probably in the locality of Noviodunum, and an area of metamorphic geology, perhaps around Tulcea. A wider range of vessel forms are present in this group than amongst earlier types. Whilst jars are still the most abundant (e.g., Fig. 1G), a small number of sherds could be assigned to jugs, pitchers and lamps, although bowls were not identified and it is likely that this function was fulfilled by the imported sgraffito wares. Sherds are rarely decorated.

Locally Produced? Glazed Wares

Small quantities of coarse glazed wares were identified, particularly in later deposits. Three types occur; Highly Fired Glazed Wares, similar to the Well-fired, Wheelthrown Wares, Coarse Glazed Wares and Amber Glazed Wares (AMB). Petrologically, some may have been produced locally and the introduction of glazed wares would correspond well with the capital investment required to produce Well-fired, Wheelthrown Wares in the area. Many of the wares have fairly indistinctive fabrics however and may have been imported to the region. Some samples have been submitted for X-Ray Diffraction analysis, to compare the composition of the fabric and glaze with earlier local and imported types.

Imported Wares

A limited range of imported wares are present, consisting of Zeuxippus- and Corinth-type Sgraffito Wares. These are generally understood to have been produced in the late 13th century³¹, their introduction perhaps relating to increasing contact between Byzantium and the Black Sea coast.

³⁰ Diaconu, Baraschi 1977, 51.

³¹ Vroom 2003, 164-165.

Conclusions

The earliest medieval pottery at Noviodunum can be dated to the 10th-11th centuries, on the basis of stratigraphic and numismatic evidence. It appears that in the 11th century there was a relatively sudden change in the pottery produced in the region, with Oxidised and Buff, Limestone-tempered Wares starting to be produced. These wares continued to be used through the 12th century and possibly as late as the 13th century. Towards the end of this phase Reduced Sandy Wares started to be used and by the late 13th century coarser rock-tempered and shelly wares appear to have been used commonly at Noviodunum. The use of these coarser wares may relate to the two sunken featured buildings constructed as part of the settlement in this area of the site probably in the 12th century. The final phase sees the introduction of a new type of pottery, Well-fired, Wheelthrown Ware, in the 14th century and it is possible that glazed wares were produced locally too. This corresponds to a period of increased contacts between Byzantium and the Black Sea coast and the emergence of the autonomous region of Dobrogea, and may demonstrate capital investment in the region, leading to the emergence of new pottery industries and potentially wider changes in other areas of the economy.

A quantified approach to pottery analysis has allowed us to consider how the types present changed through time, as well as to consider the rate of change. This analysis has also demonstrated the problem of residuality in distinguishing the date of features, in particular in considering the transition from phases 2–3. Correlation with the stratigraphic sequence, numismatic data and radiocarbon dates does allow us to roughly calibrate the sequence however. This has demonstrated that the Noviodunum sequence does, in general terms, fit with the dating suggested from excavations elsewhere in the region. It does seem however that the phase 2 sandy wares continued for longer than has previously been argued. When considered alongside the numismatic evidence, it can be argued that Noviodunum continued to be occupied, and that people continued to use similar types of pottery, into the 12th century, after the official abandonment of the fort.

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