

# Byzantium and the Slavs in the Light of Goldsmiths' Production

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## Introduction

It is very difficult to determine the extent to which Byzantium influenced the production of Slavic jewellery. This issue has been researched to varying degrees according to period and geographical area. The picture is also influenced by the different nature of the comparative material, which will be examined in this paper. Most information is provided by those areas under the strongest influence from the Byzantine Empire, but even here one has to deal with partially processed material. The closest comparative material for Slavic metalwork comes mainly from the Byzantine provinces and borderland areas.

In this paper I will discuss both current trends and ideas in 'Slavic' archaeology with regards to the origins of Slavic metalwork, as well as making my own observations. The paper covers the extensive geographical areas – western,<sup>1</sup> eastern<sup>2</sup> and southern<sup>3</sup> - inhabited by the 'historic' Slavs. However, it was not, as it seems, a uniform cultural area, but composed of different parts which, subject as they were to different influences, need to be considered separately. The main question still under debate is: who were the early Slavs?<sup>4</sup>

The terms 'Byzantine' and 'Byzantine nation' are also difficult to define. I am in agreement with Cyril Mango's comment that: 'it must be strongly emphasised that there never existed a Byzantine 'nation':<sup>5</sup> as Mango has shown the Byzantine Empire was not ethnically homogeneous.<sup>6</sup> It is also problematic to define exactly what is 'Byzantine' jewellery. By this I do not mean 'high status' jewellery, but the common ornaments used throughout the Empire.

In general Byzantine jewellery exercised both a direct and indirect influence on Slavic metalwork production. As a

springboard for this discussion I have selected three time periods covering the 6th to the mid-13th centuries roughly parallel to the Early Byzantine period (6th–9th century), the Middle Byzantine period (10th–12th) and the beginning of the Late Byzantine period (13th–15th).<sup>7</sup> The first period ranges from the 6th century, when the Slavs first appeared on the borders of the Empire,<sup>8</sup> to the end of the first half of the 8th century when the early Slavic cultures of the Volyn'tsevo horizon/culture vanish.<sup>9</sup> Next is the Great Moravian period from the 9th to the beginning of the 10th century<sup>10</sup> and finally the period which sees the initial formation of the Slav polity in the form of the Bohemian<sup>11</sup> and Polish kingdoms,<sup>12</sup> and Kievan Rus'.<sup>13</sup>

## The early Slavs

The early Slavs covered large areas of Central and Eastern Europe. There are three main archaeological cultures: the 'Prague' culture which included south-eastern Poland, the Czech Republic, Slovakia, western Ukraine, south-western Belarus,<sup>14</sup> with regional variants in Ipotești-Căndești-Ciurel in present day Romania,<sup>15</sup> and Sukow in north-western Poland and north-eastern Germany;<sup>16</sup> the 'Pen'kovka' culture which ranged from central Ukraine to northern Moldavia and north-eastern Romania,<sup>17</sup> as well as outliers from Byzantine Dobruja,<sup>18</sup> and finally, the 'Kolochin' culture in south-eastern Byelorussia and western Russia.<sup>19</sup>

The question of Byzantine influence on the Slavic ornaments of the Early Middle Ages (6th–7th century) has not as yet been researched in depth. My attention here will focus on production artefacts, such as various types of casting moulds (Pls 1 and 2), star-shaped earrings (Pl. 3), as well as



Plate 1:1–3 Three stone moulds from Vadu Săpat (1), Argamum (2) and Budureasca (3), Romania

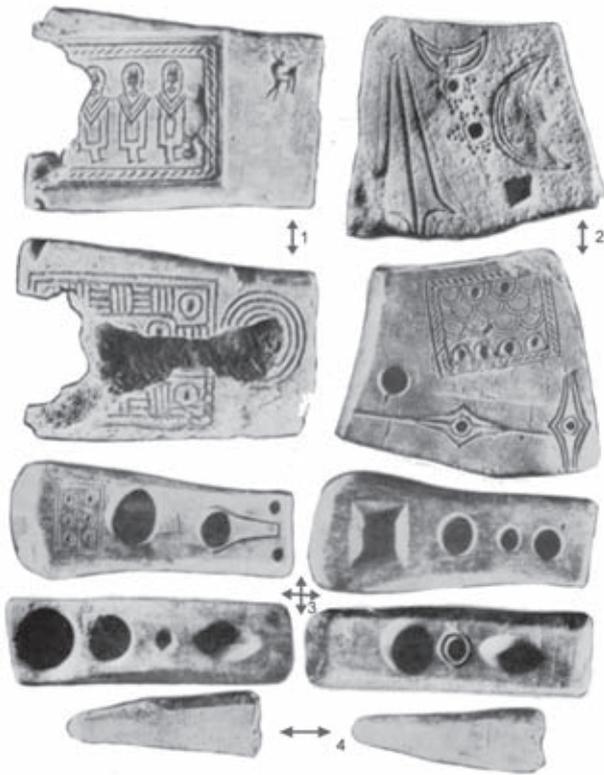


Plate 2:1–4 Bone moulds from Costești, Romania

brooches with human or animal decoration of the so-called 'Dnieper' style (Pl. 4), which scholars have viewed as 'exotic' for the Dnieper region, and finally embossed silver plate-brooches (Pl. 5).

Casting moulds occur in the Early Slav period with varying frequency; their greatest variety can be observed in the areas north of the Lower Danube. Owing to the stylistic connections between the shape of the mould negatives found in these areas with actual objects made of non-ferrous metals, one can prove the existence of southern, Byzantine areas of stylistic and technological influence. Their existence is confirmed by finds of moulds carved with various types of rosette-shaped patterns/designs, the outlines of star-shaped and melon-shaped earrings, and crosses and dies used for the casting of ornaments (Pl. 1:1–3). In contrast, in the northern and eastern parts of the Slavic territories there are moulds with trapezoidal, circular and rectangular designs, typical of the forest zone and the forest-steppe belt.<sup>20</sup> One curious example was one of a number of casting moulds found near the Budureasca Valley in the parish of Vadu Săpat in Romania (Pl. 1:1).<sup>21</sup> It was made with great precision from a different material (grit stone) to the other moulds (limestone) found in the Budureasca Valley micro-region. One of the mould carvings is equivalent in form to a silver earring from Maglavit.<sup>22</sup> Another mould from the Budureasca micro-region has impressions resembling pseudo-granulation of a type which reflects the stylistic influence of provincial Byzantine workshops (Pl. 1:3). A mould with a similar carving in the form of a number of small hollows in two rows joined with an arc is analogous to ornaments found in the Byzantine fortification of Argamum in northern Dobruja in Romania (Pl. 1:2).<sup>23</sup>

Star-shaped earrings (Pl. 3), which are known to have been present in various cultural environments, provide a starting

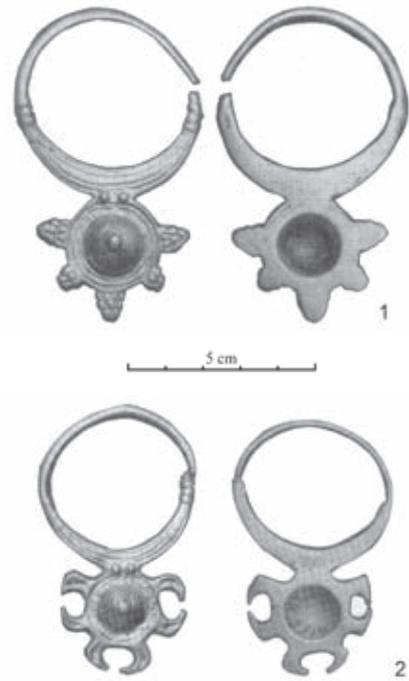


Plate 3 Star-shaped earrings from Pastyr's'ke hill fort, Ukraine

point for this discussion. They were most popular in the central Danube area, Transylvania and along the Adriatic coast, but are also quite common in a belt stretching from the lower Danube, along the Carpathians, and up to the Dnieper Basin. Single specimens only have been found in Sicily, north Italy, Greece and the Crimea. In Central Europe (the Carpathian Basin) they were found in Avar graves. A few examples were also recovered from Slav settlements and cemeteries on the northern rim of the Carpathian Basin. In Eastern Europe they are known from hoard inventories from the middle Dnieper Basin, *i.e.* from the 'Antiquities of the Antes' and the territory of the 'Pen'kovka' culture. In southern Europe star-shaped earrings seem to represent an 'international' fashion which spread to a variety of cultures, starting with the Lombards, then on to the Koman culture, the population of the Avar khaganate, and to those Slavs who lived outside the Avar Empire.<sup>24</sup> The prototype of star-shaped earrings must be sought in earrings from Sicily dated to the end of the 6th and the beginning of the 7th century.<sup>25</sup> Gradually they became more elaborate and by the second half of the 7th century they consisted of a lunate body with a disc-shaped pendant adorned with three or five rays (Pl. 3). A perceptible increase in the quantity and geographical diffusion of star-shaped earrings took place in the 7th and 8th centuries. The scope of their expansion was, however, extraordinarily fluid and culminated in a number of regional variations. In the Balkan peninsula single specimens can be found as late as the 10th–11th century.<sup>26</sup> Star-shaped earrings were produced either by casting or embossing. Three mould negatives for star-shaped earrings and a metal die have been found in Central Europe and another similar mould has been found on the Adriatic coast.<sup>27</sup>

Two stone moulds were found in Romania in Soldat Ghivan street, Bucharest,<sup>28</sup> and Dichiseni,<sup>29</sup> and a bone die/mould is known from Costești, also in Romania.<sup>30</sup> The most interesting is the bone die/mould from Costești (Pl. 2:2). On the surface were

engraved two negative designs for star-shaped earrings in the form of a lunate body and a pendant with five rays. It can be assumed that the negatives from Costești served as the primary mould *i.e.* they were used as a receptacle for molten (lost) wax which when hardening took on the exact shape of the mould. Then the wax was coated in clay and baked in such a way that the wax was able to escape. The cavity left by the wax was then filled with molten metal. When the metal cooled down the clay mould was broken to reveal the metal casting, an exact copy of the original model. The lost-wax technique ensured that the mould was considerably less susceptible to wear: if it had been used as an ordinary die and subjected to constant hammering, its life would have been all too short. Although this explanation of the mould's function is plausible it does not invalidate the generally accepted interpretation of the Costești find as a set of embossing dies. The final step, after making the lunate bodies and the pendants, was to decorate them with granulation and filigree.

Stone moulds were used in the casting process. Moulds such as those from Bucharest (Soldat Ghivan street) were probably used for the central element of star-shaped earrings. More detailed designs are on the mould negative from Dichiseni: here the surface was engraved with a design for a complete star-shaped earring which included not only the lunate body but also three pointed rays. Further mould negatives from Cucuteni and Soveja in Romania were used for both the central part of the earrings and the star-shaped pendants.<sup>31</sup> In a broader European context one can point to two metal dies for producing the body of a star-shaped earring: one comes from Biskupije in Croatia,<sup>32</sup> the other from Břeclav-Pohansko in Moravia, Czech Republic.<sup>33</sup> The die from Biskupije was part of a set of 24 metal positive and negative moulds for producing a variety of decorative objects. Some of the Biskupije models have analogues in the Avar cultural zone.<sup>34</sup> Two of the published metal dies were used to emboss the lower elements of the earrings – round pendants with rays (Pl. 3).

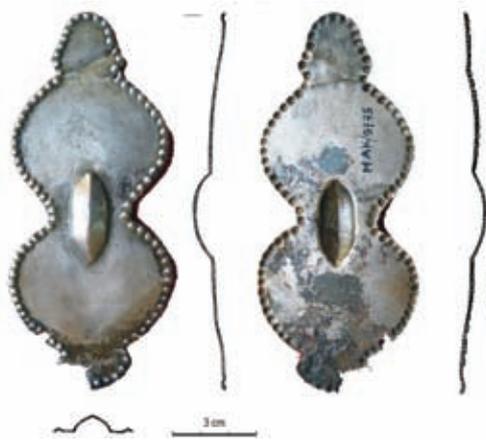
Other examples of jewellery are the so-called 'anthropomorphic' brooches of the Dnieper class which constitute some of the most characteristic and 'exotic' artefact types of Early Medieval metalwork from Eastern Europe. These brooches make up a significant element of the material culture of the eastern Slavonic region in the later phases of the Early Middle Ages. Anthropo-zoomorphic brooches of the Dnieper type dating from the early phases of the Early Middle Ages are mainly known from Eastern Europe. Their distribution pattern can be divided into two distinct areas: the first takes in the zone of the Ukrainian forest and steppe and the river-basin of the middle Dnieper, while the second is limited to the south-eastern Crimea.<sup>35</sup> They are well represented among the finds coming from the hill fort at Pastyr'ske in Ukraine, as well as in the grave goods from inhumation cemeteries in the Crimea, Avar graves from present day Hungary, and Serbia; individual pieces are also known from the Republic of Moldova, Bulgaria, Belarus and northern Russia.<sup>36</sup> The group of objects presented in this paper has not, apart from some short studies, been addressed in any detail. The most significant treatment of the topic is the incomplete study by A.K. Ambroz<sup>37</sup> who assembled the majority of known brooches and proposed a *schema* for their development. The following analysis of the manufacturing

techniques for the production of anthropo-zoomorphic brooches was conducted on the basis of a detailed visual observation of the brooches from Kölked-Feteketapu A<sup>38</sup> and from the collection of the Archaeological Museum in Cracow.<sup>39</sup> For the brooches from Martynivka (Martynovka), the monograph by Pekarskaja and Kidd was consulted.<sup>40</sup> The following analysis is devoted to two styles of brooches which can be distinguished within this 'family' of brooches of the Dnieper type.<sup>41</sup>

The first of these (Style I, with two variants) is characterised by the presence of two or three stylised bird and animal heads which project from the edges of the brooch's plates (Pls 4:1 and 4:2); the surface of the plate is additionally decorated with engraved ornament. A variant of this type sees the replacement of the animal head on the foot plate with a representation of a human face. A richly developed surface characterises the appearance of brooches in Style II, with two or three pairs of heavily stylised animal heads placed symmetrically along the top and bottom edges of the plates. In the majority of cases the plates as well as the bows are joined together by bars, forming a single open-work structure.



Plate 4:1–3 Anthropo-zoomorphic brooches from Martynivka, Ukraine (1), Kölked -Feteketapu A, Hungary (2), Pastyr'ske, Ukraine (3)



**Plate 5** Double-plated silver brooch of the 'Dnieper' class from the middle Dnieper area (?), Archaeological Museum, Cracow

Additional decorative elements on certain specimens are plates with the representation of a stylised human head. Examples of this style generally lack any surface decoration. Style I includes, *inter alia*, the brooches from Martynivka (Pl. 4:1), Koziivka, Kölked-Feketekapu A, and Kaniv (Ukraine) and were probably made by Byzantine craftsmen.<sup>42</sup> This is proved by the use of decorative elements and depictions of animals alien to the natural environment of the middle Dnieper.<sup>43</sup> The brooch from Kölked-Feketekapu A (Pl. 4:2), like the one from Martynivka, was first made on a wax slab in the shape of a brooch and then had the decoration added. Having examined the surface decoration, one can say that the design was cut out employing a triangular-sectioned chisel. Traces of wax modelling are best seen on the inside of the bow and as a series of grooves on the inside surfaces of the brooches' plates. It is worth mentioning here that the two examples from Martynivka differ slightly from each other. This difference is noticeable both in the surface ornamentation as well as in the form of the side projections in the shape of birds' heads. The brooch from Kölked-Feketekapu A was made in an identical fashion as traces of wax modelling are noticeable on the outside of the brooch and on the reverse of the bow. Moreover, there is a vertical groove on the reverse of the lower plate. So far it has been impossible to identify with any certainty the function of this groove. It seems that it may have facilitated the casting of the lower catch of the brooch's clasp and helped distribute the surface tension in the cooling metal more evenly.

The collection of the Archaeological Museum in Cracow is the most interesting with regard to the variety of manufacturing techniques within this group of anthropo-zoomorphic brooches. It consists of 10 specimens and one can distinguish three groups of brooches on the basis of their production techniques. Some analysed items were made using the lost wax method, most probably employing three different moulds. Differences in the production techniques are clearly visible. As with the brooches from Martynivka and Kölked-Feketekapu A, the brooches from Cracow have similar traces on the surface following the wax modelling process (Pl. 4:3): traces of the smoothing of the surface and modelling of the bow which can be observed on the inner surface. It is also noticeable in the analysis of the decorative motifs. In one case it

seems that the desired shape was also cut out in a wax slab and then the bird-head projections were attached using wax bridges. The wax models were covered with clay and, after melting out the wax, the clay model was filled with molten metal.

The fashion for decoration incorporating stylised animal and human representations penetrated into the middle Dnieper area. It was then transformed in the local environment and adapted to the existing means of decorating objects. The mass production of anthropo-zoomorphic brooches in the hill fort of Pastyr's'ke points to the popularity of this category of metal objects.<sup>44</sup>

At the end of the 7th and beginning of the 8th century various cultural transformations occurred which changed the political landscape of the eastern Slavic territories: parts of the 'Pen'kovka' and Kolochin culture were transformed into the Volyntsevo culture, the Romens'ka culture settled on the left bank of the Dnieper, and the remnants of the Prague culture were displaced by the Luka-Raikovetska culture.<sup>45</sup> The most interesting is the older Volyntsevo horizon, which combined earlier traditions from the second group of the 'Antiquities of the Antes', as it is referred to in the Russian literature.<sup>46</sup> They developed earrings with star-shaped pendants as well as the previously-mentioned, wide-plated, anthropo-zoomorphic brooches which were alien to the Dnieper environment. A Caucasian origin has been suggested for the latter.<sup>47</sup> However, in this context, mention must be made of the bone matrix from Costești in Romania noted above, whose ellipsoid hollow most probably served to emboss the inside part of a brooch (Pl. 2:3). Moreover, traces of punches with rounded terminals are similar to ones known from other silver plate ornaments from that area. The die with an oval concavity is surely linked with the production of the convex centre-pieces of the so-called double-plated, silver embossed (also called anthropo-zoomorphic) brooches from Ukraine from the second group of the 'Antiquities of the Antes' (Pl. 5).

Finally, I would like to return to the deposits from Costești. Notable among the mould negatives from this deposit is the rectangular plaque with three human figures, representing in all likelihood three bishops (Pl. 2:1). There are a number of clues which support this interpretation. First, each of the figures wears a long robe, which could well be a Byzantine tunic known as a *sticharion* (a robe similar to a tunic though slightly longer), and a triangular-shaped garment which could be an *omophorion*. The *omophorion* was an indispensable part of liturgical costume and worn exclusively by Byzantine bishops.<sup>48</sup> In the Eastern Church it made its appearance by the end of 6th century and has been in use ever since. The shape of the *omophorion* varied (though not greatly) depending on the place where it was made; however, these differences do not correlate in a significant way with chronology.<sup>49</sup> The trio must represent three of the Early Church Fathers, perhaps John Chrysostom, Gregory of Nazianzus, and Basil of Caesarea.<sup>50</sup> This mould is unique in south and East Europe. Although its function is unclear, it can be surmised that it was used to produce either one of the facing elements of a reliquary box made of some organic material, or as a die for part of a buckle plate.

### Southern Slavic territories and Great Moravia

Because of its proximity to Byzantium, the southern Slavic area was under stronger Byzantine influence compared with other regions occupied by the Slavs.<sup>51</sup> Some academics assume that burial ornaments which date back to the period between the 8th and the first half of the 9th century were Byzantine imports which constituted the source of inspiration for local 9th–11th-century goldsmiths.<sup>52</sup> Two regions, Dalmatia and Bulgaria, both of which according to Koder<sup>53</sup> constituted 'typical' Byzantine provinces, might also have been the starting point for goldsmiths' production in Great Moravia and the northern Slavic territories.<sup>54</sup> Kóčka-Krenz<sup>55</sup> has argued that Bulgaria could have been the region where the prototypes of semi-circular earrings with a long pendant might have originated, as well as earrings of the Świątniki type, and even possibly earrings with 'maize cob' pendants.

Great Moravia was a particular phenomenon and constituted the second state after the so-called Realm of Samo (Samo reigned for 35 years from 623/4).<sup>56</sup> The beginnings of Great Moravia date back to the time when Mojmir I (820–46) united the tribal centres, namely the Principalities of Nitra and Moravia, in the year 833 and it increased in importance in Central Europe during the reign of Svatopluk (871–94). It was then that its greatest, though brief, expansion occurred, reaching out beyond the previous area limited to the catchment basin of the rivers Morava, Dyje, Váh, Nitra and Hron. A large state body was founded which was named Magna Moravia by Constantine Porphyrogenitus. The first formal contacts with Byzantium were established during the rule of Rastislav (846–70) and were connected with attempts to make the Moravian church independent from the bishopric of Salzburg. The failure of these attempts resulted in paying closer attention to Byzantium and sending envoys to the Emperor Michael III (842–67) and Patriarch Photius. In response Constantinople dispatched the mission of Cyril (earlier Constantine) and Methodius, an event of enormous significance for the further history of the Slavic territories.<sup>57</sup> The decline of Great Moravia is associated with the Carolingian Franks who 'in a series of invasions, with the help of the Hungarians, physically destroyed the core of the kingdom, the principality of Moravia'.<sup>58</sup>

Great Moravia can be seen as a combination of various cultural phenomena which are difficult to define. Great Moravian goldsmiths took their inspiration from antiquity, the Avars and the two strongest contemporary cultural centres: in the west the Carolingian Empire, and in the east, Byzantium.<sup>59</sup> Jewellery of Byzantine origin, the so-called Byzantine-oriental and the Veligradsky types,<sup>60</sup> could have been made locally, albeit under strong influences from Byzantium and oriental countries: 'these new forms and techniques were not copied passively, but were transformed in the local idiom, establishing in this way the roots of the distinctive Great Moravian jewellery style'.<sup>61</sup> The problem of the origin and chronology of the so-called 'Veligradsky type' is still being debated.<sup>62</sup> Niederle<sup>63</sup> was the first to identify these richly decorated ornaments as the products of Byzantine and oriental goldsmiths. In previous scholarship this type of ornament was dated from the second half of the 9th century and was regarded as being inspired by the jewellery of Byzantium and eastern Mediterranean and Adriatic models.<sup>64</sup> Szóke<sup>65</sup> argued

that any Byzantine-oriental influence was only hypothetical and that there was no evidence to indicate that these were Byzantine products, but on the contrary were inspired by Late Avar metalwork. Recently scholars have accepted the Byzantine origin of some of the jewellery.<sup>66</sup> Galuška identified the appearance of buttons with plain transverse ribbing found in Uherské Hradiště-Sady with a Byzantine mission there<sup>67</sup> and items from Staré Město and Mikulčice as Byzantine imports.<sup>68</sup>

Ornaments from the Veligradsky horizon were the subject of a thorough study by Chorvátová in 2004,<sup>69</sup> and she has subsequently updated her findings.<sup>70</sup> To that horizon she attributes the carefully and precisely made head ornaments with knobs constituting the elements of outer attire. Her analysis of earrings and buttons (*gombiki*) has led her to distinguish three horizons for Byzantine-oriental jewellery. Horizon A (Pl. 6A) included earrings with a grape pendant with an ornamented upper arc, semi-lunate earrings with basket-shaped (openwork) beads, beads with granulation, and earrings with 'maize cob' and column-shaped pendants. This horizon also included gold buttons with either plain transverse ribbing or an embossed spiral motif as well as silver buttons with completely granulated surfaces. In Horizon B (Pl. 6B) new variants of six- and nine-basket earrings with beaded filigree appeared as did variations of bead earrings with granulation. Some semi-lunate and 'maize cob' earrings still persisted as did earrings with beads, but grape-pendant earrings seem to have disappeared. Also appearing for the first time are silver embossed buttons. Gold buttons with the embossed spiral motif or with plain vertical ribbing seem to have disappeared.

Horizon C (Pl. 6C) was dominated by earrings with four, six or seven beads while earrings with six or seven basket beads still flourished, although their production technique changed in favour of smooth wire or made from two thinner wires twisted together. Gold buttons embossed with a palmette in a heart-shaped meander and silver buttons with overall granulation or with granulated patterns still occurred in this horizon.

### State-formation: eastern Slavic territories

The origin of eastern Slavic jewellery is again rather difficult to resolve. The territories encompass various cultures: local (the forest zone), northern (Scandinavia), western (the legacy of Great Moravia [?]), southern (Byzantine) and eastern (oriental).<sup>71</sup> To discuss the issue of Byzantine influence on eastern Slavic jewellery I have chosen examples from different periods of eastern Slavic jewellery production. Here I discuss Korzukhina's comments on hoards from Rus', which she has divided into four chronological groups dating from the 9th century to 1240. According to her, from the mid–10th century, the techniques of embossing, filigree and granulation were employed, perhaps through the medium of the western Slavs.<sup>72</sup> Analysis of hoard deposits between the 10th and the beginning of the 11th century indicates a lack of regional variants in the filigree technique which did, however, occur at a later period as indicated by finds from hoards dating from the 12th to the first quarter of the 13th century.<sup>73</sup> Zhilina's second technological group of filigree jewellery, dated to the 10th to 11th century and characterised by pressed filigree (imitating true filigree wire), is the result of contact between Byzantium and Rus'.<sup>74</sup>

A



**Plate 6** Examples of earrings and buttons from the Byzantine-oriental horizons according to Chorvátová's (n. 69) division: Top: Horizon A; middle: Horizon B; bottom: Horizon C

B

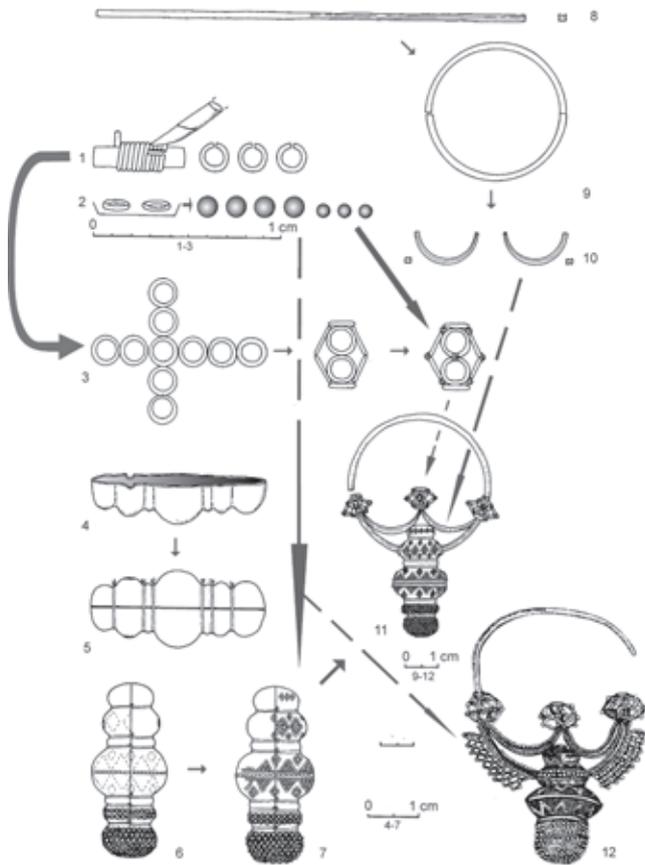


C

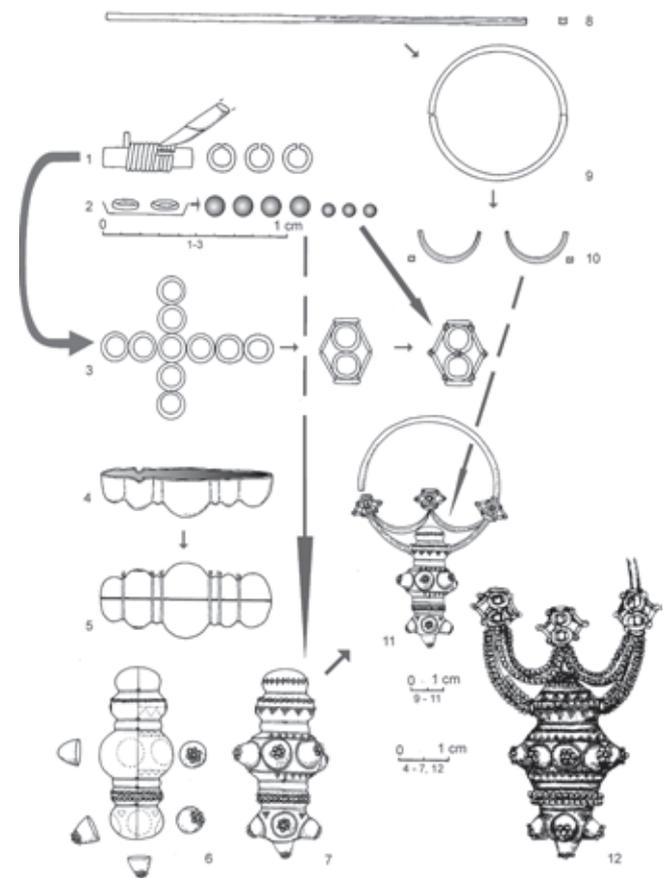


The first examples are Borshchevka-type earrings (also known as the Volhynian type),<sup>75</sup> and 'bow' beads with granulated ornament, both of which belong to the second group of Rus' hoards.<sup>76</sup> It is assumed that these ornaments, which are unparalleled in form, were produced in the Volhynia (western Ukraine) area and that their chronology is limited to the period from the mid-10th to the beginning of the 11th century.<sup>77</sup> Borshchevka-type earrings consist of an elongated profiled bead joined by two arcs. In its upper part there were three beads on each of the protruding elements of the arc, the beads formed from either sheet metal or openwork gadrooned wire. Generally earrings of this type can be divided into two kinds: either with a meander/plait element below the lower edge of the arc and with silver granules at the end, or specimens lacking that element.<sup>78</sup> They were made from high quality silver and each specimen consisted of more than 13 different elements (see **Pls 7–8** for the method of manufacture). On the basis of a thorough analysis of the

earrings from Gnězdovo, two types of wire – single and doubled both with circular cross-section – were distinguished. On the surface there were more than 2,100 granules measuring approximately 0.1mm in diameter, with larger ones ranging from 0.8 to 2mm.<sup>79</sup> Beads were constructed from nine elements made of sheet metal. The ornament on these consisted of even finer granulation with the granule diameter ranging from approximately 0.6 to 0.7mm.<sup>80</sup> Local production of these ornaments was confirmed by the find of a goldsmith's grave at Peresopnitsa on the Stubla in western Volhynia, dated to the beginning of the 11th century. In the largest barrow, in burial 29, the grave of a young man was found in which one part of the grave furnishings was a wooden box with eight bronze moulds, a small hammer, an iron anvil and various weights.<sup>81</sup> Among those moulds were crescent-shaped negatives which served to emboss the halves of the 'bow' beads (**Pl. 9:A**), and four elongated and segmented ones to emboss pendants for Borshchevka-type earrings (**Pl. 9:B**). Duczko has argued that



**Plate 7** Production cycle of Borschchevka-type earrings, based upon an example from Ciechanów II, Poland



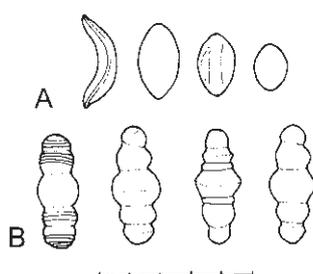
**Plate 8** Production cycle of Borschchevka-type earrings, based upon an example from Torsta, Sweden

the presence of these ornaments confirm the existence of a jewellery production centre located in the Volhyn area under Byzantine influence.<sup>82</sup> It is worth mentioning here that the trade route from Cracow–Volodymyr–Volyns’kyi–Luts’k–Kiev mentioned by al-Idrīsi ran through Peresopnitsa.<sup>83</sup>

From c. 1050–1100 totally new types of jewellery were introduced into Rus’ which were undoubtedly influenced directly by Byzantine workshops (Pl. 10);<sup>84</sup> associated with the fashions of the urban élite,<sup>85</sup> they constituted elegant ornaments not previously found in the eastern Slavic milieu such as *kolty* (Pl. 11), bracelets, armbands, and diadems (Pl. 12) decorated with enamel.<sup>86</sup> Gold *kolty* were manufactured in Rus’ under Byzantine influence from the mid- to the end of the 11th century,<sup>87</sup> and from 1150 the local production of silver examples embellished with niello can be observed. Gold and silver *kolty* decorated with *cloisonné* enamel were produced for the upper classes, with princesses and boyarinas the typical clients. The lower classes usually wore coarser ornaments, cast in moulds, a phenomenon which occurred from around 1100.<sup>88</sup>

Tools for the production of gold *kolty* decorated with *cloisonné* enamel have been found in Kiev.<sup>89</sup> One was a bronze template with a schematic representation of two confronted birds and two perforations symbolising elements of the tree of life (Pl. 13:2). A convex copper disk, slightly larger in size than the template, was found next to it (Pl. 13:1). The process was as follows: the template was placed on a gold sheet and the outlines of the shapes and the edge of the *kolt* were cut out. The next stage was to place the sheet onto the convex disc to achieve the convex surface. Then the segment structure which was made of gold strip was soldered from beneath and filled with enamel. The final stage was to join the two halves, either decorating the edge or leaving it unornamented (Pl. 14).

Recently, in the area of south-western Rus’ in Chełm (eastern Poland) two related artefacts were found (Pl. 15:1, 2);<sup>90</sup> one of them, a former or die with a beaded border, must have been used for making imitations of *kolty* with hollow beaded surrounds (Pl. 15:1). In the case of nielloed silver *kolty* the discoveries of formers or dies with varying decorative motifs confirmed their local manufacture. A silver sheet was put on the former, and then the required pattern was hammered out by hitting a lead ‘force’ placed over the silver sheet, with a jeweller’s hammer. Similar formers with traces of hammering have been found in some sites in Rus’ (Pl. 16).<sup>91</sup> Next, to further emphasise the decorative motifs, the required shape was hammered out with smaller punches. Lastly, the edges of the semi-circular surface were trimmed and filed and then joined with the other half to make a whole, before the fastening element and other decorative elements such as rounded, hollow beads were finally added.<sup>92</sup>



**Plate 9 A and B** Moulds from a goldsmith's grave at Peresopnitsa, Ukraine



Plate 10 Gold and enamel *kolt*, Byzantine, 11th century



Plate 11 Gold and enamel *kolt*, Kievan Rus', late 11th to early 12th century



1



2

Plate 12:1 Gold and enamel diadem, Kievan Rus' (Kiev, hoard of 1889), 12th–13th century

Plate 12:2 Gold and enamel *kolty* and headdress ornaments, Kievan Rus' (Kiev, hoard of 1827), 12th–13th century

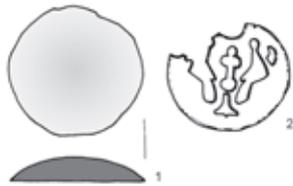


Plate 13: 1 and 2 Copper former and bronze template for the production of gold and enamel *koly* from Kiev



Plate 14 Production cycle of a gold and enamel *koly* from Kiev



Plate 15 Examples of dies for *koly* from south-western Rus' (1 and 2) in Chełm, Poland

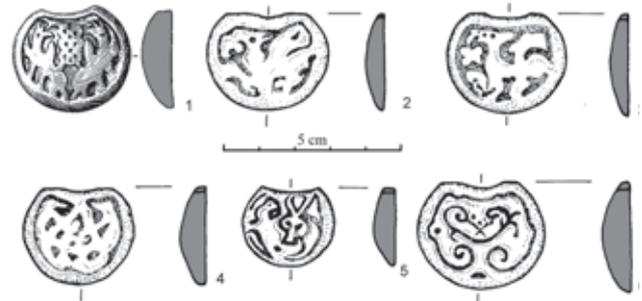
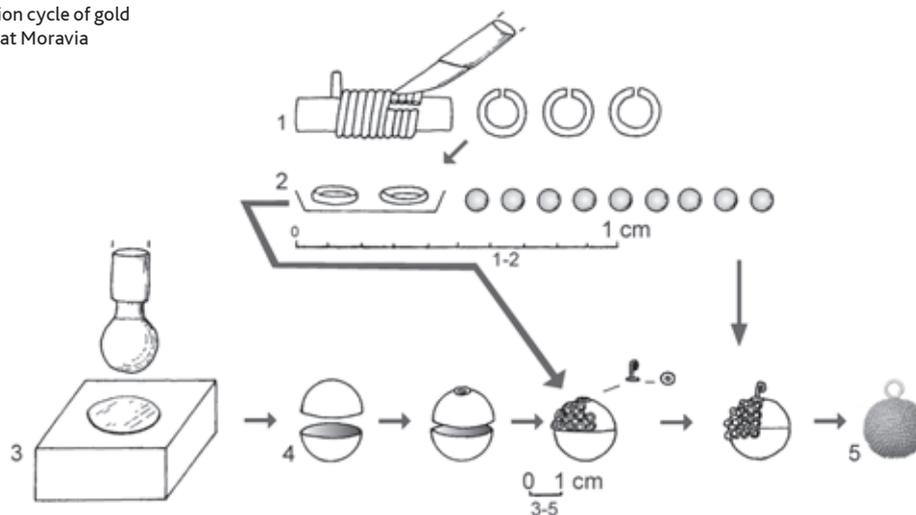


Plate 16 Examples of dies for *koly* from Rus' 1: Navahrudak, Belarus; 2 and 5: Kursk, Russia; 3: Kaluga Oblast, Russia; 4: unknown place in Russia; 6: Vshchizh, Russia

#### State-formation: western Slavic territories

The production of jewellery in the western Slavic territories must be considered in the context of products from the southern and northern areas. In south-western Slavic jewellery, in addition to native patterns,<sup>93</sup> one can observe the influence of jewellery from Great Moravia. Earrings with three basket-shaped beads serve as an example of the transformation of earlier Great Moravian models: these were a development from the earlier four and multi-basket versions.<sup>94</sup> The transfer and adaptation of the production techniques of these ornaments was connected with the transferral of goldsmiths' workshops to Czech strongholds following the decline of Great Moravia.<sup>95</sup> In the case of the northern part of the western Slavic territories, various sources of influence on local jewellers have been proposed: Byzantine with local reciprocity;<sup>96</sup> Byzantine, through Great Moravia to Lesser Poland;<sup>97</sup> eastern, through Kievan Rus' to northern and central Poland;<sup>98</sup> Scandinavian and oriental,<sup>99</sup> and finally, eastern<sup>100</sup> and Arab, through the territories of southern Rus' as exemplified by imitations of filigree and granulation.<sup>101</sup> J. Žak assumed that in the 10th and at the beginning of the 11th century, north-western Slavic jewellery production was initially the work of Jewish goldsmiths, and then both Jewish and local goldsmiths making formal references to Byzantine-oriental types.<sup>102</sup> Earrings of the Břeclav-Pohansko variant from Zawada Lanckorońska, Poland (earrings with four beads), representing the Zawada type, can be identified as having been made under indirect influence from Great Moravia. It has been noticed that for the production of ornaments from the Zawada treasure a particular granulation technique was used, which consisted of mounting granules on wire rings – a technique which may have originated in Byzantine workshops.<sup>103</sup> This tradition is known from Great Moravian workshops and appears suddenly in the

Plate 17 Production cycle of gold buttons from Great Moravia



to local traditions, also clearly reflect trends of ornamentation in the neighbouring south European territories. In the early state period, the influence of Byzantine jewellery production, mostly through Rus', can also be observed.

**Conclusion**

In conclusion one can say that three horizons which illustrate the intensity of the influence of Byzantine goldsmiths on Slavic precious metal production can be distinguished. In the Early Slavic period outside influences on non-ferrous metal craftsmanship came mainly from the Byzantine provinces. The closest influences can be observed in those areas located to the north of the Lower Danube as confirmed by finds of casting moulds and star-shaped earrings analogous to those found in Byzantine forts. Their presence in southern Slavic territories can be connected with the activities of itinerant craftsman from the Byzantine provinces. The second area was the forest-steppe and forest zone in Eastern Europe with a cultural and ethnic situation which is difficult to reconstruct. The transformation and development of the anthropo-zoomorphic style of the Dnieper-type brooches and star-shaped earrings took place here. In the older horizon of the Volyntsevo culture, there occurred silver plate brooches with embossed ornament, which were produced using dies or formers similar to those found to the north of the Lower Danube. In that case, Byzantine influences were undoubtedly transmitted through the nomads of the steppe zone.

The Great Moravian period saw a combination of strong Byzantine, oriental and Adriatic influences, the former intensified by the mission of Cyril and Methodius. Among jewellery techniques within the Byzantine-oriental horizon one sees the use of beaded filigree made of either single or double wire. Motifs and techniques were transmitted to the northern Slavic territories and the western part of the eastern Slavic territories through Great Moravia. Direct Byzantine influence on Rus' occurred during two periods: in the mid-10th century, and after the mid-11th century when new types of ornaments, the technique of *cloisonné* enamel, niello, and regional variations of filigree all appeared. Imitations of ornaments of Byzantine origin were confirmed by finds of locally produced casting moulds.

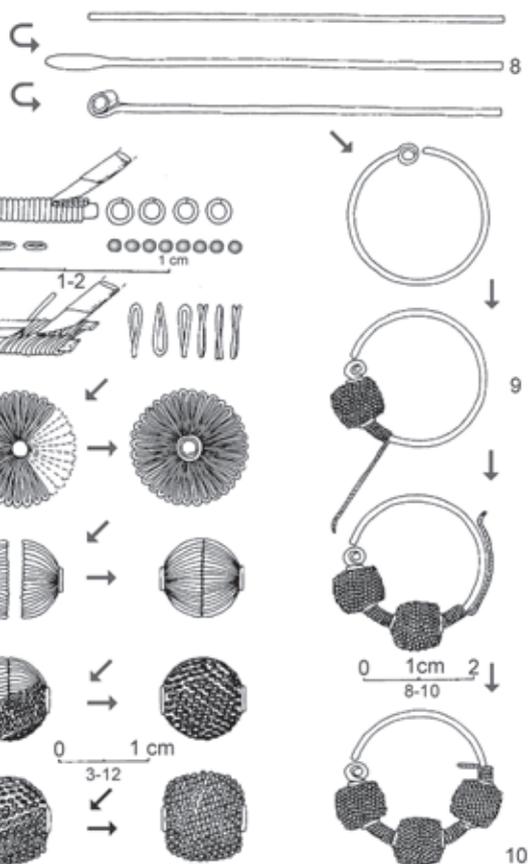


Plate 18 Production cycle of raspberry-shaped type earrings

mid- or third quarter of the 9th century (Pl. 17),<sup>104</sup> a century later the technique is used in Volhynia (Borshchevka-type of earrings) and after that on raspberry-shaped earrings known from Kievan Rus' (Pl. 18).<sup>105</sup>

A southern origin is also suggested for silver dome-like earrings with pendants on chains.<sup>106</sup> Generally, two main trends can be distinguished in the jewellery production of the north-western Slavic territories. The first is local, with a strong undercurrent of older traditions characterised by ornaments of simple forms and made from less precious materials – a perfect example of this being headband ornaments. The second is a 'court' trend associated with higher social classes and represented by sophisticated ornaments which, while referring

## Notes

- 1 L. Leciejewicz, *Słowiańszczyzna zachodnia*, Wrocław, 1976.
- 2 W. Szymański, *Słowiańszczyzna wschodnia*, Wrocław, 1973.
- 3 Z. Kurnatowska, *Słowiańszczyzna południowa*, Wrocław, 1977.
- 4 F. Curta, *The Making of the Slavs: History and Archaeology of the Lower Danube Region c. 500–700*, Cambridge, 2001.
- 5 C. Mango, *Byzantium. The Empire of New Rome*, London, 2005, 6.
- 6 *Ibid.*, 13–31.
- 7 J. Vroom, 'Piecing together the past. Survey pottery and deserted settlements in Medieval Boeotia (Greece)', in K. Belke, F. Hild, J. Koder and P. Soustal (eds), *Byzans als Raum. Zu Methoden und Inhalten der historischen Geographie des östlichen Mittelmeerraumes im Mittelalter* (Veröffentlichungen der Kommission für die Tabula Imperii Byzantini, Band 7), Vienna, 2000, 245–59, at 247–8.
- 8 Curta (n. 4); P.M. Barford, *The Early Slavs: Culture and Society in Early Medieval Eastern Europe*, London, 2001.
- 9 O.A. Shcheglova, I.O. Gavritukhin and A.M. Oblomskii, 'Pamiatniki volyntsevskogo tipa, ih spetsifika i genesis', in I.O. Gavritukhin and A.M. Oblomskii (eds), *Gaponovskii klad i ego kul'tyrno-istoricheskii kontekst, Ranneslavianskii mir* 3, Moscow, 1996, 130–6.
- 10 T. Štefanovičová, *Osudy starých Slovanov*, Bratislava, 1989; I. Boba, *Moravia's History Reconsidered. A Reinterpretation of Medieval Sources*, The Hague, 1971.
- 11 D. Třeštík, *Počátky Přemyslovců. Vstup Čechů do dějin (530–935)*, Prague, 1997.
- 12 J. Kłoczowski, *Młodsza Europa. Europa Środkowo-Wschodnia w kręgu cywilizacji chrześcijańskiej średniowiecza*, Warsaw, 1998; A. Buko, *The Archaeology of Early Medieval Poland: Discoveries, Hypotheses, Interpretations*, Leiden-Boston, 2008; P. Urbańczyk, *Trudne początki Polski*, Wrocław, 2008.
- 13 J. Martin, *Medieval Russia 980–1584*, Cambridge, 1993.
- 14 K. Godłowski, *Pierwotne siedziby Słowian. Wybór pism pod redakcją M. Parczewskiego*, Cracow, 2000; Barford (n. 8); M. Parczewski, 'Podstawy lokalizacji pierwotnych siedzib Słowian', in P. Kaczanowski and M. Parczewski (eds), *Archeologia o początkach Słowian*, Cracow, 2005, 65–75; I.O. Gavritukhin, 'Aktualne problemy uzyczenia rannei istorii slavian i slavianskogo rasseleniia na iug i zapad (prazhskaia kul'tura)', in A. P. Derevianko and N. A. Makarov (eds), *Trudy II (XVIII) vserossiiskogo arkhelogicheskogo s'ezda v Susdale* 2, Moscow, 2008, 206–28.
- 15 D. Gh. Teodor, 'Slavii la nodul Dunării de Jos în secolele VI–VII d. H.', *Arheologia Moldovei* XVII (1994), 223–51.
- 16 M. Dulinicz, *Kształtowanie się Słowiańszczyzny Północno-Zachodniej: studium archeologiczne*, Warsaw, 2001; *idem.*, 'Najstarsza faza osadnictwa słowiańskiego w północnej części Europy Środkowej', in Kaczanowski and Parczewski (n. 14), 513–26.
- 17 A.M. Oblomskii, 'Pen'kovskaia kul'tura', in I.O. Gavritukhin and A.M. Oblomskii (eds), *Gaponovskii klad i ego kul'tyrno-istoricheskii kontekst, Ranneslavianskii mir* 3, Moscow, 1996, 108–21; O. Prikhodniuk, *Pen'kovskaia kul'tura. Kul'turno-kronologicheskii aspekt issledovaniia*, Voronezh, 1998.
- 18 B.Sz. Szmoniewski, 'The Antes: Eastern 'Brothers' of the Slaves?', in F. Curta (ed.), *Neglected Barbarians*, forthcoming.
- 19 A.M. Oblomskii, 'Kolochinskaia kul'tura', in Gavritukhin and Oblomskii (n. 17), 96–108.
- 20 B.Sz. Szmoniewski, 'The production of objects from non-ferrous metals in the area of Central and Eastern Europe in the initial phases of the Early Middle Ages', *Revista Română de Studii Eurasiatice* 1 (2005), 107–20.
- 21 A. Măgureanu and B. Ciupercă, 'The 6th–8th centuries metallurgical activity from Budureasca valley. The moulds', *Acta Musei Napocensis* 41–42/1 (2004–05) [2007], 291–318, at 298, 301–2, figs 3, 9:1.
- 22 *Ibid.*, 298.
- 23 R. Oanță-Marghitu, 'Argamum între imperiul Roman târziu și "barbari" obiectele mărunte ca ipostaze ale comunicării', *Orgame/Argamum*, Supplementa 1 (2006), 345–73, fig. 1:4.
- 24 M. Comşa, 'Quelques données concernant les rapports des territoires Nord-Danubiens avec Byzance aux VI<sup>e</sup>–VIII<sup>e</sup> siècles (Pendant d'oreille en forme d'étoiles)', *Revue Etudes Sud-Est Européennes* 9 (1971), 377–90; D. Staššiková-Štukovská, 'K výskytu lunulových náušnic s hviezdicovým priveskom v severnej časti Karpatskej kotliny', in A. Avenarius and Z. Ševčíková (eds), *Slovensko a Európsky Juhovýchod, Miedzikulturne vzťahy a kontexty (Zborník k životnému jubileu Tatiany Štefanovičovej)*, Bratislava, 1999, 250–98; B.Sz. Szmoniewski, 'Production of early medieval ornaments made of non-ferrous metals: dies from archeological finds in north-east Romania', *Acta Archaeologica Carpathica* 37 (2002), 111–37, at 128–9; Đ. Janković, *Srbsko Pomorje od 7. do 10. Stoleta*, Belgrade, 2007, 195–7.
- 25 Comşa (n. 24), 387–8; A.I. Aibabin, 'K voprosu o proiskhoahdenii seriozhek Pastyrskogo tipa', *Sovetskaia Arkheologiia* 3 (1973), 62–73, at 66.
- 26 Aibabin (n. 25), 68.
- 27 Szmoniewski (n. 24), 124.
- 28 V. Teodorescu, 'Centre meșteșărești Din sec. V/VI–VII. e. n. în București', *Materiale de istorie și muzeografie* IX (1972), 73–99, at 77, fig. 3:1.
- 29 D.Gh. Teodor, 'Cersei cu pandantiv stelat din secolele VI–VIII d. Hr. în spațiul carpato-dunăreano-pontic', *Spațiul carpato-dunăreano-pontic în mileniul marilor migrații, Biblioteca Mousaios* 3 (2003), 303–21, at 311.
- 30 D. Gh. Teodor, 'Elemente și influente Bizantine în Moldova în secolele VI–XI', *Studii și Cercetări de Istorie Veche* 21/1 (1970), 97–128, at 102–6, figs 2, 4 and 5; Szmoniewski (n. 24), 113, 115, 118, figs 2 and 3.
- 31 Szmoniewski (n. 24).
- 32 J. Korošec, 'Ostava brončanah matrica za otiskivanje u Biskupiji kod Knina', *Starohrvatska prosvjeta* 3/6 (1958), 29–44, fig. II:2; Z. Vinski, 'O nalazima 6. i 7. stoljeća u Jugoslaviji s posebnim obzirom na arheolosku ostavstinu iz vremena provog avarskog kaganata', *Opuscula Archaeologica* 3 (1958), 13–67, pl. XVI, fig. 7:6.
- 33 B. Dostál, *Břeclav-Pohansko. 4. Velkomoravský velmožský dvorec*, Brno, 1975, 224–5, fig. 7:7.
- 34 C. Balogh, 'Az avar kori preselt, lemezes boglarok', *A Móra Ferenc Múzeum Évkönyve, Studia Archaeologica* 6 (2000), 219–35, fig. 3.
- 35 J. Werner, 'Slawische Bügelfibeln des 7. Jahrhunderts', in G. Behrends and J. Werner (eds), *Reinecke Festschrift zum 75. Geburtstag von Paul Reinecke am 25. September 1947*, Mainz, 1950, 150–72, at 158–9, figs 34:3, 35:3–5, 7, 9, 10; A.I. Aibabin, 'Khronologiiia mogil'nikov Kryma pozdnerimskogo i rannesrednevekovogo vremeni', *Materialy po arkhelogii, istorii i etnografii Tavrii* 1, Simferopol, 1990, 3–86 and 175–241, at 25–6, figs 13:2, 3, 5–7; V.A. Rodinkova, 'K voprosu o tipologicheskome razvitiu antropozoomorfnykh fibul (prostye formy)', *Rossiiskaia Arkheologiia* 3 (2006), 41–51; *idem.*, 'K voprosu o tipologicheskome razvitiu antropozoomorfnykh fibul (slozhnye i dvuplastinchatye formy)', *ibid.*, 4 (2006), 50–63.
- 36 B.Sz. Szmoniewski, 'Anthropo-zoomorphic brooches of the Dnepr type in initial phases of the early Middle Ages. The migration of a style-idea-object', *Spotkania Bytomskie* 5 (2004), 301–12, at 302; *idem.*, 'Two worlds, one hoard: what do metal finds from the forest-steppe belt speak about?', in F. Curta (ed.), *The Other Europe in the Middle Ages*, Leiden–Boston, 2008, 263–96.
- 37 A.K. Ambroz, 'K proiskhozhdeniiu dneprovskich antropozoomorfnykh fibul', *Rossiiskaia Arkheologiia* 2 (1993), 179–84, fig. 3.
- 38 A. Kiss, *Das awarenzeitlich gepidische Gräberfeld von Kölked-Feketekapu A.* (MFMA 2 = Studien zur Archäologie der Awaren 5), Innsbruck, 1996, fig. 76:6.
- 39 M. Parczewski, 'Metalowe zabytki naddnieprzańskie z VI–VIII w. w zbiorach krakowskiego Muzeum Archeologicznego', *Archaeoslavica* 1 (1991), 115–28; *idem.*, 'Dalsze zabytki naddnieprzańskie z VI?, VII–VIII w. w zbiorach krakowskich', *ibid.*, 2 (1993), 113–22.
- 40 L.V. Pekarskaja and D. Kidd, *Der Silberschatz von Martynovka (Ukraine) aus dem 6. und 7. Jahrhundert* (Monographien zur Frühgeschichte und Mittelalterarchäologie, 1), Innsbruck, 1994, fig. 3.
- 41 Szmoniewski 2008 (n. 36).
- 42 Ambroz (n. 37); Szmoniewski 2008 (n.36).
- 43 Szmoniewski 2008 (n. 36).
- 44 *Ibid.*
- 45 Shcheglova *et al.* (n. 9), 130–5.
- 46 O.A. Shcheglova, 'O dvukh gruppakh 'drevnostei antov' v srednem Podneprov'e', in R.V. Terpilovskii, *Materialy i issledovaniia po arkhelogii Dneprovskogo Levoberezh'ia*, Kursk, 1990, 162–204.
- 47 I.O. Gavritukhin, *Dvuplastinchataia fibula iz chastnoi kollektсии (zametki o pozdnykh formakh dvuplastinchatyykh fibul)*, forthcoming.
- 48 Ch. Walter, *Sztuka i obrządek Kościoła bizantyńskiego*, Warsaw, 1992, 26, 234.

- 49 *Ibid.*, 27.
- 50 *Ibid.*, 128–9.
- 51 F. Curta, *South-eastern Europe in the Middle Ages, 500–1250*, Cambridge, 2006.
- 52 J. Belošević, *Materialna kultura Hrvata od VII do IX stoljeća*, Zagreb, 1980, 85–90; M. Ljubinković, 'Ka preciznijem datiranju starijeg slovenskog nakita na Balkanu', in I. Erceg, A. Horvat, I. Mažuran and M. Suić, *Gunjačin Zbornik u povodu sedamdesete godine života i četrdeset i pete godine znanstvenog rada*, Zagreb, 1980, 87–98.
- 53 J. Koder, *Der Lebensraum der Byzantiner. Historisch-geographischer Abriss ihres mittelalterlichen Staates im östlichen Mittelmeerraum* (Byzantinische Geschichtsschreiber 1), Graz-Vienna-Cologne, 1984, 17.
- 54 H. Kóčka-Krenz, *Bižuteria pólnocno-zachodnio-słowiańska we wczesnym średniowieczu*, Poznań, 1993, 153; T. Štefaničová, 'K vývoju šperku adriatickéj a stredodunajskéj oblasti v prvej polovici 9. Storočia', in G. Fusek (ed.), *Zborník na počesť Dariny Bialekovej*, Nitra, 2004, 389–95.
- 55 Kóčka-Krenz (n. 54), 152–3.
- 56 Curta (n. 4), 109.
- 57 Boba (n. 10); F. Dvornik, 'The significance of the missions of Cyril and Methodius', *Slavic Review* 23/2 (1964), 195–211; Kłoczowski (n. 12), 40–2.
- 58 Boba (n. 10), 5.
- 59 K. Wachowski, 'Pólnocny zasięg ekspansji Wielkich Moraw w świetle badań archeologicznych', in *idem.*, (ed.), *Śląsk i Czechy a kultura wielkomorawska*, Wrocław, 1997, 21–3, at 21.
- 60 B. Dostál, *Slovanská pohřebišťe ze střední doby hradištní na Moravě*, Prague, 1966.
- 61 J. Poulík, 'The Origins of Christianity in Slavonic Countries North of the Middle Danube Basin', *World Archaeology* 10/2 (1978), 158–71, at 160.
- 62 H. Chorvátová, 'Horizonty byzantsko-orientálního šperku na tzv. Vel'komoravských pohrebiskách', *Zborník Slovenského národného múzea Archeológia Supplementum* 2 (2007), 83–101; Š. Ungerman, 'Ženský šperk staršího velkomoravského horizontu', *Archeologické rozhledy* LVII (2005), 707–49.
- 63 L. Niederle, *Přispěvky k vývoji byzantských šperků ze IV.–X. Století*, Prague, 1930.
- 64 Poulík (n. 61), 160.
- 65 B.M. Szőke, 'Die Beziehungen zwischen dem oberen Donautal und Westungarn in der ersten Hälfte des 9. Jahrhunderts (Frauentrachtzubehör und Schmuck)', in F. Daim (ed.), *Awarenforschungen II, Archaeologia Austriaca, Bd. 1., Studien zur Archäologie der Awaren*, 4, Vienna, 1992, 841–968, at 862.
- 66 Ungerman (n. 62), 716.
- 67 L. Galuška, *Uherské Hradiště-Sady. Křet'anské centrum říše velkomoravské*, Brno, 1996, 100.
- 68 L. Galuška, *Slované doteky předků. O životě na Moravě 6.–10. století*, Brno, 2004, 110.
- 69 H. Chorvátová, 'K relativnej chronology pohrebiska Staré Město v polohe Na valách', *Acta Historica Neosoliensia* 7 (2004), 199–236.
- 70 Chorvátová (n. 62).
- 71 S.S. Riabtseva, *Drevnerusskii iuvelirnyi ubor. Osnovnye tendentsii formirovaniia*, St Petersburg, 2005.
- 72 G.F. Korzukhina, *Ruskie klady IX–XIII vv*, Moscow-Leningrad, 1954.
- 73 N.V. Zhilina, 'Regional'nye razlitsiia v russkoi filigranii', in N.A. Makarov and A.V. Chernetsov, *Rus' v IX–XIV vekakh. Vzaimodeistvie Severa i Iuga*, Moscow, 2005, 105–17, at 105 and 116.
- 74 *Ibid.*, 105.
- 75 R. Rabinovich and S.S. Riabtseva, 'Iuvelirnye ukrasheniia s zern'iu iz Karpato - podnestrov'ia v kontekste kul'turno-istoricheskikh protsessov X–XI vv.', *Stratum plus. Peterburgskij arkeologicheskii vestnik*, 1997, 236–45.
- 76 Korzukhina (n. 72).
- 77 H. Zoll-Adamikowa and M. Dekówna, 'Typological and chronological analysis', in H. Zoll-Adamikowa, M. Dekówna and E.M. Nosek, *The Early Mediaeval Hoard from Zawada Lanckorońska (Upper Vistula River)*, Warsaw, 1999, 96–118, at 96–100; Riabtseva (n. 71), 84–6.
- 78 W. Duczko, *Slavic Silver Jewellery from the Viking Period. An Analysis of Material from Gotland*, Uppsala, 1972, 28–9.
- 79 N. Eniosova and T. Pushkina, 'Some technological aspects of fine metalworking in Gnezdovo: an analysis of the hoards from the Upper Dnieper region', in G. de Boe and F. Verhaeghe (eds), *Art and Symbolism in Medieval Europe. Papers of the 'Medieval Europe Brugge 1997' Conference* 5, Zellik, 1997, 65–71, at 65.
- 80 W. Duczko, 'En slavisk pärla från Uppland. Några problem kring den vikingatida granulationskonsten', *Tor* XIX (1980/2), 189–233, at 195–200.
- 81 G.F. Korzukhina, 'O tekhnike tisneniia i peregoradchatoi emali v drevnei Rusi X–XII vv.', *Kratkie Soobshcheniia Istorii Material'noi Kul'tury* 13 (1946), 45–54; *eadem.*, (n. 72), 73, fig. 15.
- 82 Duczko (n. 80), 224.
- 83 T. Lewicki, 'La voie Kiev-Vladimir (Włodzimierz Wołyński) d'après le géographe arabe du XIIIe siècle, al-Idrīsī', *Rocznik Orientalistyczny* 13 (1938), 91–105; I.G. Konovalova, *Vostochnaia Evropa v sochenii al-Idrisi*, Moscow, 1999, 132–3.
- 84 Riabtseva (n. 71), 179.
- 85 *Ibid.*, 189.
- 86 *Ibid.*, 279.
- 87 S.S. Riabtseva, 'The Kiev Russian Kolts. Their Analogs and Prototypes', *Studia Antiqua et Archaeologica* 6 (1999), 125–46.
- 88 A. Haduch and R. Liwoch, 'Koltki z południowo-zachodniej Rusi', *Seminarium Trepcańskie*, Sanok, 2007, 43–50, at 43.
- 89 Korzukhina (n. 81), 53, fig. 14; B.A. Rybakov, *Remeslo Drevnei Rusi*, Moscow, 1948, 378–80, fig. 104.
- 90 S. Gołub, 'Nadzór i badania ratownicze na stanowisku 99 w Chełmie, ul. Szkolna 8–10, Krzywa 41, Św. Mikołaja 7–9', *Informator o Badaniach Archeologicznych w Województwie Chełmskim w 1994 roku*, Muzeum Okręgowe w Chełmie, Chełm, 1997, 53–61, at 61, pl. IV:1; S. Gołub and T. Dzieńkowski, 'Osada Przygodowa z czasów Daniela Romanowicza w Chełmie', in E. Banasiewicz-Szykuła (ed.), *Badania archeologiczne o początkach i historii Chełma*, Lublin, 2002, 57–72, at 67, fig. 6:4.
- 91 I.E. Zaitseva, 'Traditsii Severnoi i Iuzhnoi Rusi v iuvelirnom dele Serenska', in Makarov and Chernetsov (n. 73), 145–52, at 145, fig. 2:2,3; N.V. Eniosova and T.G. Saratseva, 'Drevnerusskie iuvelirnye instrumenty iz tsvetnykh metallov (rezul'taty khimiko-tekhnologicheskogo issledovaniia)', *Kratkie Soobshcheniia Instituta Arkheologii RAN* 202 (2006), 88–101, at 95, fig. 3:2–6; K.A. Lavysheva, *Khudozhestvennye traditsii vostochnoi i vizantiiskoi kul'tury v isskustve srednevekovykh gorodov Belarusi (X–XIV vv.)*, Minsk, 2008, 85, figs 160–1.
- 92 Rybakov (n. 89), 303–4, fig. 77.
- 93 Z. Krumphanzlová, 'Přispěvek k vývoji lidového šperku 10. stol. v Čechách', *Památky Archeologické* 54 (1963), 87–113.
- 94 J. Eisner, 'Počátky českého šperku', *Památky Archeologické* 46 (1955), 215–26; Z. Klanica, *Práce klenotníků na slovanských hradištích*, Prague, 1974.
- 95 M. Šolle, *Staroslovanské hradisko. Charakteristika, funkce, vývoj a význam*, Prague, 1984, 178.
- 96 E. Gąsowska, *Bizancjum a ziemie pólnocno-zachodnio-słowiańskie we wczesnym średniowieczu*, Wrocław, 1979.
- 97 E. Stattler, 'Kontakty handlowe ludności wczesnopolskiej z krajami arabskimi we wczesnym średniowieczu (IX–XI w.)', *Slavia Antiqua* 13 (1966), 199–269; M. Dekówna, 'Ozdoby i srebro lane', in M. Dekówna, J. Reyman and S. Suchodolski, *Wczesno-redniowieczny skarb srebrny z Zalesia, pow. Słupca*, Wrocław, 1974, 45–140.
- 98 Stattler (n. 97).
- 99 Dekówna (n. 97).
- 100 R. Kiersnowski, *Pieniądz kruszcowy w Polsce wczesnośredniowiecznej*, Warsaw, 1960, 342, fn 38.
- 101 W. Szafranski, 'Jeszcze w sprawie pochodzenia wczesnopolskiej biżuterii srebrnej', *Slavia Antiqua* 10 (1963), 367–80, at 378–80.
- 102 J. Žak, 'Importy skandynawskie na ziemiach zachodniostowiańskich od IX do XI wieku (część analityczna)', *Poznań*, 1967, 268–9, fn 301.
- 103 H. Zoll-Adamikowa and M. Dekówna, 'Final Remarks', in Zoll-Adamikowa et al. (n. 77), 131.
- 104 *Ibid.*, 'Typological and chronological analysis', in *ibid.*, 96–118, at 113.
- 105 *Ibid.*, 103, fn 21, 113.
- 106 H. Kóčka-Krenz, 'Bižuteria średniowieczna na ziemiach polskich jako wyznacznik chronologiczny', *Archaeologia Historica Polona* 6 (1997), 69–75, at 70.