

Viking Age Gold from Old Rus'

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The Viking Age is often regarded as an 'Age of Silver' since silver dominated in Viking-Age society and economy. Objects of gold are comparatively rare in Scandinavia, as well as in Western and Eastern countries where northern influence was considerable. The aim of this paper is to present some initial results arising from a study of the distribution and use of gold in Rus' during the 10th–mid 11th centuries. I shall discuss also the origin of gold as a raw material during the Viking Age.

This study includes approximately 50 Scandinavian and Slavonic ornaments of gold that have been found in the cultural layers, graves and hoards from major towns in the Old Russian kingdom, including Kiev, Černigov, Polock, Suzdal' and Gnezdovo. Also included are about 40 Byzantine nomismata and solidi, 1 dinar from Arabic Spain, 11 coins minted by Russian Prince Vladimir (Volodymyr) (980–1015) and 5 ingots, which complete the list of gold items found in the Rus' kingdom dated c. 950–1050 (fig. 1).

Gold Arm-rings: Jewellery or Means of Payment?

The corpus of Russian gold ornaments is monotonous. There are mainly plain penannular or annular arm-rings formed from a rod of circular section and annular arm-rings formed from 3 or 4 tapering rods twisted together (fig. 2). It suggests they represent a special kind of money in the shape of jewellery, which was a convenient means of payment in large units. The weights of the gold arm-rings are distributed from 24 to 200 grams (Table 1). The table estimates the metrological evidence of their adjustment by weight to the Scandinavian mark or the Russian pound. There were almost identical units used in the east and the west of Europe. A fraction of the pound that is equivalent to c. 50 gram is the *grivna*. This is a weight standard corresponding to 20 dirham (Hårdh 1996:144–145; Nazarenko 2001:146–147).

Simple, plain and standard penannular gold 'ring money' occurs in the hoards from Scandinavia, Britain and the southern parts of Rus' from the period between the mid 10th and the mid 11th centuries. Numerous pecking-marks (In this case I follow Hårdh 1996:77 and Graham-Campbell 1995:33, 38ff) are often evident on the gold rings (fig. 3). They should be interpreted as the physical traces left by the customer or merchant when a gold object was examined for the possibility of being a forgery; simultaneously, the same method also tested for fineness (Graham-Campbell 1995:33, 38ff). The gold was generally of very high quality (Table 1).

This weight-money unit was possibly established to satisfy the needs of long-distance trade with Byzantium, where gold was the base of the currency. The stream of Byzantine coins to Rus' (including gold) increased during the 10th century after agreements of 907, 911, 944 and 971 specifying the terms under which the Rus' were allowed to trade in Constantinople.

Gold arm-rings are abundant in Kiev and Černigov, which were the main residences of the Grand Prince of the Russian kingdom. According to the *Russian Primary Chronicle* gold was the main means of payment in trade with the Greeks. Gold coins, ingots and massive ornaments accumulated in the Grand Prince's treasury. They may have been 'reserved' money for future purchases at the market in Constantinople or for tax payments (Kro-



Fig. 1. Map of Eastern Europe showing the geographical distribution (triangles) of Viking-Age gold finds in Rus'.

Provenience	Weight (gram)	Purity range (%)
Černigov (Ukraine)	56.6	83
Černigov (Ukraine)	50.12	95
Kiev (Ukraine)	99.3	
Kiev (Ukraine)	108.6	
Suzdal' (Russia)	94	99.9
Suzdal' (Russia)	96	99.9
Suzdal' (Russia)	104	99.9
Polock (Belarus)	97.6	
Polock (Belarus)	98	
Polock (Belarus)	101.4	
Birka (Sweden)	198.13	96
Birka (Sweden)	196.57	96
Vester Vedsted (Denmark)	24.1	
Vester Vedsted (Denmark)	27.3	
Vester Vedsted (Denmark)	48.8	
Vester Vedsted (Denmark)	97.5	
Vester Vedsted (Denmark)	103.6	

Table 1. Weight and fineness of the gold arm-rings from Old Rus' and Scandinavia after Museums' metal testing & publications (Skovmand 1942:71; Zachrisson 1992:52–53; Sedova 1997:89; Miluzin 1993:511).

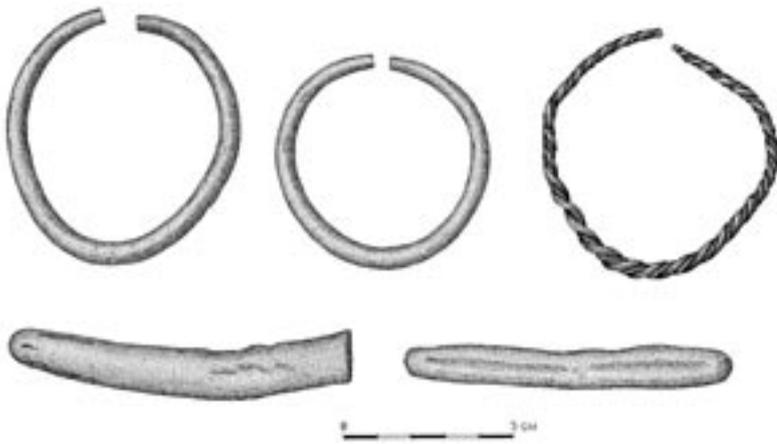


Fig. 2. The gold arm-rings and ingots from the hoard found in Kiev (after Korzuchina 1954:90, Table X).

potkin 1962:13; Zocenko 1991:74, 77).

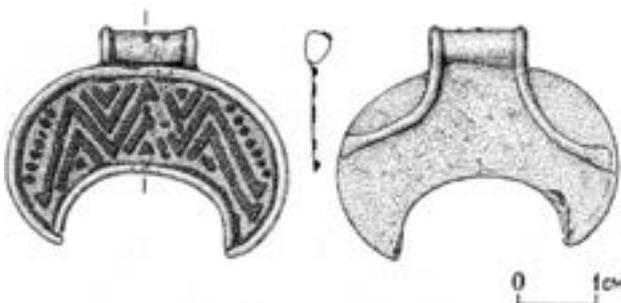
Apart from Kiev, gold arm-rings have been found at the excavations of the noble property in Suzdal' which was a capital city of north-eastern Russia from the early 11th century (Sedova 1997:89f). Another set of the gold arm-rings came from Polock situated on the Western Dvina. This town had been ruled by a separate Scandinavian dynasty since the early 11th century (Miluzin 1993:511). According to the *Russian Primary Chronicle* the annual tribute paid by a small Russian town to the central power had the value of two gold arm-rings weighing around four grivnas or 200 g (Rybakov 1964:19f).

Fig. 3. A pecking-mark on the gold arm-ring from Černigov (after Korzuchina, 1954:92).



Besides the homogenous group of arm-rings containing c. 21 items, there is a small set of gold ornaments that originated from the southern area of Rus' (fig. 4). It includes 3 ring-pendants formed from glass beads threaded on a beaded wire with twisted terminals found in the Scandinavian female graves in Kiev; 7 finger-rings from Kiev and Černigov; and 2 Slavonic lunula pendants found accidentally in Kiev (Golubeva 1949:107f; Korzuchina 1954:92; Sizova 1991:8).

Fig. 4. Gold lunula- pendant from Kiev (accidental find).



In spite of the high value of metal most of the gold ornaments from Kiev, Černigov, Suzdal' and Polock were manufactured using very simple procedures. Even princely ornaments remained very modest until the late 11th century. The Russian goldsmith craft reached the prominent level during the next historical epoch (Korzuchina 1954:62–68).

Gold in Gnëzdovo

In contrast to the items noted above, the gold ornaments from the early urban site at Gnëzdovo are much more diverse. Most of them originated from a female grave found at the fortified settlement at Gnëzdovo in 1940 (Milonov & Andreev 1940:26ff) (fig. 5). There are three gold disk-shaped pendants decorated with three filigree volutes placed on the flat substrate. The smallest pendant is the plainest, decorated with beaded wire only (fig. 6:1). The other two are almost identical: they were decorated with beaded wire and big granules placed on small wire rings (fig. 6:2, 3). According to the most recent publication on Viking-Age filigree and granulation jewellery there are 69 pendants with three, four or five volutes found in Northern and Eastern Europe (Eilbracht 1999:179–187). Aside from the objects from Gnëzdovo there is only one pendant (Trewiddle, Cornwall, Britain) made of gold, among thirty-three with volute decoration (Eilbracht 1999:179ff, Taf.7:104).

The grave also contained a rectangular pendant decorated with s-spiral and omega motifs combined in the central cross figure made of beaded wire with rare granules. In contrast to the widespread disk-shaped pendants with volutes the last ornament is unique (fig. 6:4). The omega motif occurs also on the round gold pendant from the Slemmedal (Hommedal, Aust-Agder) hoard in Norway (Eilbracht 1999:192, Taf.7: 104).

The last gold item from the grave mentioned above is a ring-pendant with the glass bead made of beaded wire with twisted terminals (fig. 6:5). Two gold and five silver objects of the same simple kind have been found in the graves, hill-fort and settlement cultural layers dated to the second half of the 10th–early 11th centuries.

The list of gold objects from Gnëzdovo continues with two Byzantine coins that were adapted into pendants (Theophilus, 829–42; Alexander, 912–13) and a disk-shaped brooch with a Jellinge animal motif (Kropotkin 1962:28). The last one was found in a rich female grave dated to the mid 10th century, which belongs to the 'forest mound group'. Despite the great variety of brooches with filigree and granulation made of precious metals there are no close parallels to the Gnëzdovo item (fig. 7:1). It should possibly be placed with a small group including two silver brooches from Danish hoards (Vester Vested, Ribe, Jylland and Sejbrø, Skjallinge, Holbæk, Sjælland) and one object from the necropolis in Kiev. All brooches were decorated with animal heads with big eyes and interlaced body patterns (Eilbracht 1999:222, Taf.27: 316-317; Karger 1958:205–206, Table XXVI:2).

Most of the gold decorations from Gnëzdovo belong to the same stylistic and technological circle as the so-called Terslev and Hiddensee ornaments. The known gold items decorated in Terslev and Hiddensee styles, and metal-working evidence for their production, are concentrated primarily in south-western Scandinavia and Northern Germany (Duczko 1993: 185ff; Eilbracht 1999: 133ff; Armbruster 2002a:87–178; 2002b:223–231). These ornaments are products of the highly specialised goldsmiths working for the Danish kings during the middle – late 10th century. In spite of the relative rarity of these high status objects (c. 40 gold items from 326 pieces from Terslev and Hiddensee) they were spread all over the Viking World – from Iceland to Russia – by members of the Danish court and their followers (Duczko 1995:644–657; Eil-

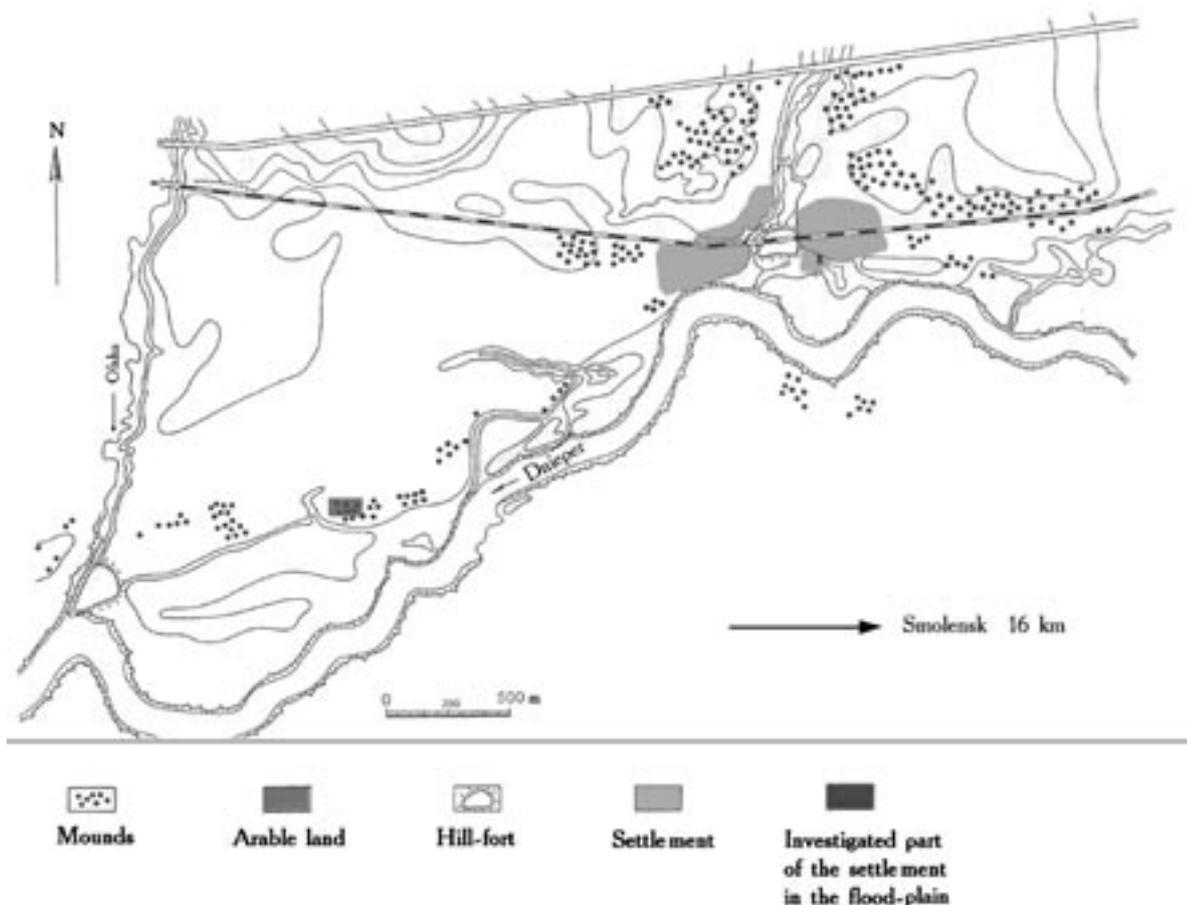


Fig. 5. The Gnëzdovo settlement with hill-forts and cemeteries.

bracht 1999:179–224).

Gnëzdovo is notable for the large quantity of typically Scandinavian magic objects made of iron, copper alloys, silver and for evidence of their local production (Jansson 1987:781–782; Novikova 1991:175–199). Among the miniature hammers, spears, swords and other small items there are only two amulets made of thin sheets of gold. The model of the shield with a central boss and whorl punch-work decorations was found in the same cremation grave as the gold filigree brooch (fig. 7:2).

A figurine of a 'Valkyrie' originates from the upper damaged layer of the settlement (fig. 8). The occurrence of this type of Scandinavian amulet, which is mainly found in graves and hoards, is quite unusual (Vierck 2002:24–30). All so-called Valkyries from the North were cast of copper alloy or silver and supplied with a cast suspension loop on the reverse. There is only one cast silver Valkyrie of this type from Old Rus' found at the Rjurikovo Gorodišče site near Novgorod (Nosov 1990:126, fig. 44:2).

The gold Valkyrie from Gnëzdovo looks rather different from her Scandinavian parallels. It shares much more in common with two-dimensional pictures from the picture stones found on Gotland dated to the 8th–9th centuries (Vierck 2002:26). The Valkyrie was shaped from a thin gold sheet using a chisel. Her hairstyle and dress are scratched rather carelessly from both sides with a sharp knife or a small awl. This object may be part of a larger amulet set. It consists of a suspension ring with tiny models of weapons, tools and small figurines. The small hole indicates that the Valkyrie was placed on a ring upside down. A silver amulet set with 16 different pendants as well as a separate silver figurine of Valkyrie was found at the Gnëzdovo hill-fort (Puškina 2001:313ff). The lack of parallels, simplicity and crude manufacture suggest local production of the thin sheet amulets in the second half of the 10th–early 11th centuries.

Evidence for Gold-working from Gnëzdovo

Since the early 1970s archaeological excavations at the Gnëzdovo settlement have produced increasing amounts of evidence for precious metal-working. However, up to Summer 2002 most of the evidence pertained to silver. Comprehensive sieving and washing of the cultural layers subsequently revealed the finds of gold from the hill-fort and floodplain areas. There are some fragments of the small-sized melting crucibles with gold droplets in the inner surface identified by XRF analyses. Waste material includes separate gold globules 0.8 and 1 mm in diameter, a tiny gold rivet and a piece of gold volute belonging to the Terslev-type pendant made of two flattened pieces of beaded wire (fig. 9:1, 2, 3). In addition to the Gnëzdovo material, there is some evidence for gold-working found at the Rjurikovo Gorodišče site near Novgorod. Found here were small pieces of gold wire and foil as well as a broken ornament (Nosov 1990:80).

No special tools associated with the filigree and granulation techniques were unearthed in Gnëzdovo. However, we can assume that small-scale repair was carried out in this particular place (a new suspension loop for the pendants was attached with the gold rivet, for instance). It suggests also that even the smallest pieces of gold were utilised carefully for re-melting and further use for casting, hammering or gilding.

Two almost identical miniature small-weight ingots (3.7 and 2.6 gram) came from two different sites (fig. 10). One of them was found in the heavily damaged deposits of a hill-fort. The second ingot originated from a well-stratified layer that included a metal-working workshop, which was recently excavated in the lower floodplain terrain of the Dnepr-river. It contains evidence for silver, gold, copper alloy and iron working in this particular area of the settlement during the late 10th–first half of the 11th centuries.

Gold ingots are rare in Viking-Age hoards and almost absent among the raw materials found at the major manufac-



Fig. 7. Gold decorations from the female cremation grave L-23 (the forest mound group): 1 – disk-shaped brooch with the Jellinge animal motif; 2 – shield-shaped amulet.



Fig. 6. Female grave goods found at the Gnëzdovo hill-fort: 1-3 – three-vo-lutes disk-shaped pendants; 4 – rectangular pendant with omega and s-spiral motifs; 5 – ring-pendant with the blue glass bead.



Fig. 8. Gold 'Valkyrie' found at the eastern part of Gnëzdovo settlement in 2002.

turing centres (Hårdh 1996:160ff). According to A. Oldeberg 'unfashioned' gold in the form of bars and rods occurred on Gotland, in Trelleborg and Skåne (Oldeberg 1966:251). A small piece of a hack gold ingot was found in Hedeby (Armbruster 2002a:132, 200, sample 25). Its purity (Au–72%, Ag – 26.5%, Cu – 0.85%) is much lower than the fineness of the ingots from Gnëzdovo.

Chemical Composition of Viking-Age Gold

An XRF analysis of six items of gold jewellery, waste and ingots from Gnëzdovo showed from 76% to 99% gold (Table 2).

Very little information has been published on the composition of Viking-Age gold. There are 9 samples made by specific gravity methods and published by W. Oddy and V. Meyer and 50 analyses made by XRF by E. Pernicka and published by B. Armbruster (Oddy & Meyer 1986:172, Table 11; Pernicka 2002:199f). All selections show gold purity between 60% and 99%. However, high purity (Au > 90%) is much more common for Viking-Age gold-working. We can suggest that a wide range of gold alloys was in use in the Viking period and there is no

evidence of progressive debasement of metal in this time. Precious metal was diluted by silver and copper depending on the availability of gold to a customer or a goldsmith approach to debasement (Ogden 1994:161). Relatively fine gold was used on occasion and certainly more frequently than for manufacture of Gotlandic bracteates in the 7th and 8th centuries, which are mostly of gold between 45% and 75% (Oddy & Meyer 1986:157).

Conclusions on the Sources of Gold in Old Rus' and Scandinavia

Byzantine gold coins are often regarded as the raw material for the Late Viking Period jewellery (Oldeberg 1966: 251). More than 600 bronze and silver byzantine coins are known in Scandinavia, but gold coins are almost absent. Gotland is the only place where two gold nomismata have been found (Duczko 1997:293). The gold coins have not been found in Northern-Western Russia with the exception of two pendants made of a solidus minted under emperors Basil II and Constantine VIII (976–1025) from Beloozero and Pskov (Zakharov 2002:122, fig. 2:16; Guruleva 2002:34ff).

Minted gold from Byzantium is much more frequent in the South. It came mostly from hoards: according to calculations of V. Zocenko there are c. 35 nomismata found in southern Russia, 25 of them from Kiev (Zocenko 1991:64ff). Possibly, a restricted amount of gold coins reached Kiev by direct contacts with Byzantium during the second part of the 10th century and the first part of the 11th century. The Greek gold was used for the first modest issue of the Russian coins and perhaps for the production of gold-rings in Kiev.

The first Russian coins were minted over a 30 year period starting in 980. There are about 340 silver coins and only 11 gold on record. The small number of gold coins suggests that they had a limited function, and were probably used mainly as prestigious gifts for allies of the Grand Prince. The phrase "Vladimir placed on a throne, and this is his gold" was stamped on them. In contrast to European and Greek coins they were minted using cast pieces of metal. The weight range is between 4.15 and 4.4 grams, while the fineness is between 92 and 96 percent (Sotnikova 1995:172ff). The high purity of the gold corresponds well with the fineness of gold Byzantine coins and jewellery (Au – 91-92%), and this lasted into the late 10th century (Metcalf 1972:384–389; Oddy & La Niece 1986:19–27).

There are several possible sources for the gold in Scandinavia and the southern parts of Rus'. Minted Byzantine gold and jewellery came to serve as the raw metal for the gold work in Kiev. However, the stream of Greek gold was limited by rigid regulations on the manufacture and sale of gold objects, established by imperial power and recorded in the 10th-century *Book of the Prefect* (Hendy 1985:251ff).

Sample	Au	Ag	Cu
Valkyria	96.41	2.55	1.4
Globule (d-0.8 mm)	76.01	23.99	
Globule (d-1.2 mm)	79.81	20.9	
Globule (d-0.5 mm)	99.5	0.5	
Rivet	98.52	1.48	
Volute	95.85	2.13	2
Ingot (weight – 3.7 g)	98.42	1.58	
Ingot (weight – 2.6 g)	92.31	7.69	

Table 2. Surface ED XRF analysis of gold objects from Gnëzdovo in elemental weight percentage (%) (carried out by Dr R. Mitoyan at the Dept. of Geochemistry of Moscow State University).



Fig. 9. Evidence for gold-working in Gnëzdovo: 1 – globules; 2 – rivet; 3 – beaded-wire volute found at the hill-fort (3) and in the metalworking workshop (1–2).



Fig. 10. Gold ingots from metal-working workshop (left) and hillfort (right).

We can assume that gold and silver came to Northern Europe separately. Oriental and Byzantine silver coins supplied by 'intercontinental' trade routes led east to the Volga and the Caspian Sea or south to the Dnepr and Black Sea. During this particular period Scandinavia obtained gold from the West. It suggests that the precious metal stocks of the Migration and Vendel periods was re-worked intensively as well as being supplemented by gold from layers of placered sand and alluvial sources from the riverbanks of Upper Rhine, Danube, Moselle, Oder and Bohemia, which served as the raw material in Scandinavia (Oldeberg 1966:251; Ogden 1995:156–161). However, in the absence of further studies on the chemical composition of Viking-Age gold many complex questions still remain unanswered.

Based on the results presented here, I can conclude that the distribution of gold in Old Rus' shows clear variations between the different regions. Gold was accumulated in the aristocratic settings of Kiev, Černigov, Polock and Su-

zdał'. It is obvious that it was used mainly for taxes, tributes, and also as prestigious gifts and symbols of honour. At the same time gold is almost absent in the early towns of North-western Russia. The early urban centre Gnëzdovo situated on the Upper Dnepr took a unique position between North and South. It has yielded a large collection of uniquely Scandinavian gold ornaments reflecting direct connections between local nobility and the Danish ruling dynasty in the late 10th century. It has been demonstrated also that the excavations of the last decades have begun to provide evidence for gold-working in Gnëzdovo and Rjurikovo Gorodišče. Research into the chemical composition of Viking-Age gold has established that a relatively high purity of the precious metal was typical. In contrast to silver, gold was not diluted in the Scandinavian and Russian workshops. It seems, however, that the gold available in the southern areas of Rus' and Scandinavia derived from separate sources.

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