

BARBORA DANIELOVÁ

**NORTHERN ELEMENTS IN THE LUSATIAN CULTURE
IN SLOVAKIA ON THE EXAMPLE OF BRONZE ARTEFACTS
FROM ORAVA**

Abstract: The paper presents Lusatian culture bronze artefacts recovered in the Orava region in northern Slovakia, which allows for tracing connections with the territory of present-day Poland in the Late Bronze Age and the Early Iron Age. The object is to discuss the provenance of the Lusatian bronze artefacts and analyse possible intercultural contacts with the north, across the Carpathians.

Key words: Orava, Lusatian culture, chemical analysis, cultural contacts, bronze artefacts, Carpathians

I. INTRODUCTION

With its numerous and highly interesting – though largely accidental and uncontexted – prehistoric finds, Orava is a region worthy of archaeologists' attention. However, despite regular research carried out in the 20th century, the region is currently not within the focus of scholarly archaeological interest.

The aim of this paper is to discuss cultural links between Orava region and territory of present-day Poland during the Bronze Age and the Hallstatt Period on the basis of Lusatian culture bronze artefacts.

A trade route which possibly connected Orava and Lesser Poland in prehistoric times attracted the attention of scholars as early as the late 19th century (Kubínyi 1898b). Bronze artefacts linked with the Lusatian culture allowed such connections to be suggested by Józef Żurowski (1927), Jan Eisner (1933), Marek Gedl (1975), Pavol Čaplovič (1987), Mária Novotná (1980; 1984), and more recently also Lucia Benediková (2006; 2017) and Wojciech Blajer (2014).

Bordered by the Polish-Slovakian border to the north and east and the West Tatra and Choč Mountains to the south, Orava is the northernmost part of

Slovakia. In the south-west, Orava neighbours with the Mala Fatra range, and its western boundary is marked by the Kysuca upland and the mountain range of Kysucké Beskydy. In the northern part of the region stretches the range of Oravské Beskydy – a frontier mountain range with such peaks as Pilsko (1557 m a.s.l.) and Babia Góra (1725 m a.s.l.), the latter being the highest peak of the Outer Western Carpathians. From a geological perspective, the most part of Orava is formed by flysch, and in the northern part of the region, north of the Pieniny Klippen Belt, by the Magura nappe flysch. The region is hydrographically uniform, with nearly all the rivers starting there belonging to the catchment basin of the Orava River (Trnka, Kopilec 2007, 9).

II. LUSATIAN CULTURE IN ORAVA

As evidenced by artefacts related to the Martin horizon, the Lusatian culture probably appeared in Orava at the close of period BrD (Benkovská-Pivovarová 1972, 253 – 313; Veliáčik 1983, 163; Cheben 1981, 32). The earliest finds come from flat and barrow cemeteries at Jasenová (Čaplovič 1971), Dolný Kubín I (Čaplovič 1959b), and Vyšný Kubín (Kubínyi 1898a).

From the Younger Bronze Age, from period HaA, comes a cemetery at Oravský Podzámok (Kubínyi 1898b; Čaplovič 1987, 46-52), which belongs to the Diviaky horizon. In that period, cist graves came to predominance in Orava. Period HaB is represented primarily by the cemeteries of Dolný Kubín II and Vyšný Kubín II, and some portion of graves from Jasenová (Cheben 1981, 33) and Podbiel (Čaplovič 1968). They confirm a continuous development of the Lusatian culture culminating in the emergence of the Orava group in the Hallstatt period. The development of local groups is a phenomenon typical of the entire Slovakian group of the Lusatian culture in the Late Bronze Age, and this is reflected in the pottery (Danielová 2017, 76).

In north-western Slovakia (Orava, Turiec, upper Váh basin) and Sipš, the Lusatian culture survived throughout the Hallstatt period until the La Tène period, and the same situation can be observed on the Polish side of the border (Gedl 1976; Rydzewski 1991; 1992; 1997).

III. BRONZE AGE

Grave inventories in Orava contain primarily pins, including variants with a spherical head and decorated swollen neck, and with biconical, vase-shaped, and stamp-shaped heads (Říhovský 1979; 1983; Novotná 1980; Cheben 1981). These artefacts are commonplace throughout the Urnfield complex. Their local

manufacture is attested by the discoveries of casting moulds, for example in the barrow cemetery at Vyšný Kubín (Eisner 1933, 131; Čaplovič 1987, 61-71; Pančíková 2008, 77).

Younger Bronze Age hoards in Orava are known from Osádka (Budinský-Krička 1946, 36-43), Žaškov (Novotná 1970, 125n), and Nižná-Lazy (Kavuljak 1940; Čaplovič 1959a). They can be placed within phases HaA1–HaA2 (Novotná 1970, 66, 68). The hoard from Osádka is comprised of binocular pendants and fragments of spiral ornaments made from ribbed bronze ribbon. These objects originate from the Carpathian Basin, although they were also manufactured in Moravia, where they date to phase HaA2/HaB (Salaš 2005, 99, pl. 436).

The Late Bronze Age is represented by hoards from Pucov (Furmánek 1980, 41) and Medvedzie. The latter hoard contained a large spiral brooch with pendants, a diadem with spirals, typical of north Slovakia, and spiral rings made from bronze bars, of the Pucov type, which are most likely local Oravian products (Furmánek 1980, 41n).

Hoard from Nižná-Lazy

From the perspective of cultural connections, the hoard from Nižná-Lazy is an important find. It comprised of fragmented spirals, massive bracelets, a twisted ring, spearheads, finger rings, pendants, and other bronze objects (Fig. 1). Twisted rings are ornaments typical of the Lusatian culture (Sprockhoff 1937, 49); their evolution followed from less twisted to highly twisted forms with flat or stamp-like terminations.

Larger rings interpreted as ankle rings, with clearly marked twists and with tapering or straight ends, are precise chronological indicators (von Brunn 1968; Salaš 2005, 96). The twisted ring from Nižná-Lazy, with tapering ends decorated with notches, falls within this category. Such ornaments reached their peak of popularity in phases HaA2/HaB1. They are widespread in Lusatian culture sites along the upper and middle courses of the Elbe and Weser Rivers (von Brunn 1968, 179; Kaczmarek 2002, 159; Salaš 2005, 97; Blajer 2013, 63), but remain unknown from Slovakia (Fig. 2). Local variants with extended, stamp-like terminations occur in the east of the present-day Czech Republic (Kytlicová 2007, 61).

The twisted ankle ring (Fig. 1: 1) has been subjected to metallographic and chemical analyses (Table 1).¹ Compared with other analogically dated bronze artefacts from Orava, which usually contain 86% copper and 10-11% tin, the Nižná ankle ring stands out with its high content of copper and low content of tin (91.25 % Cu and 7.5 % Sn).

¹ The analyses were carried out in 2018 within the framework of the cooperation between the Orava Museum and Professor P. Palček from the Faculty of Mechanical Engineering of the University of Žilina.

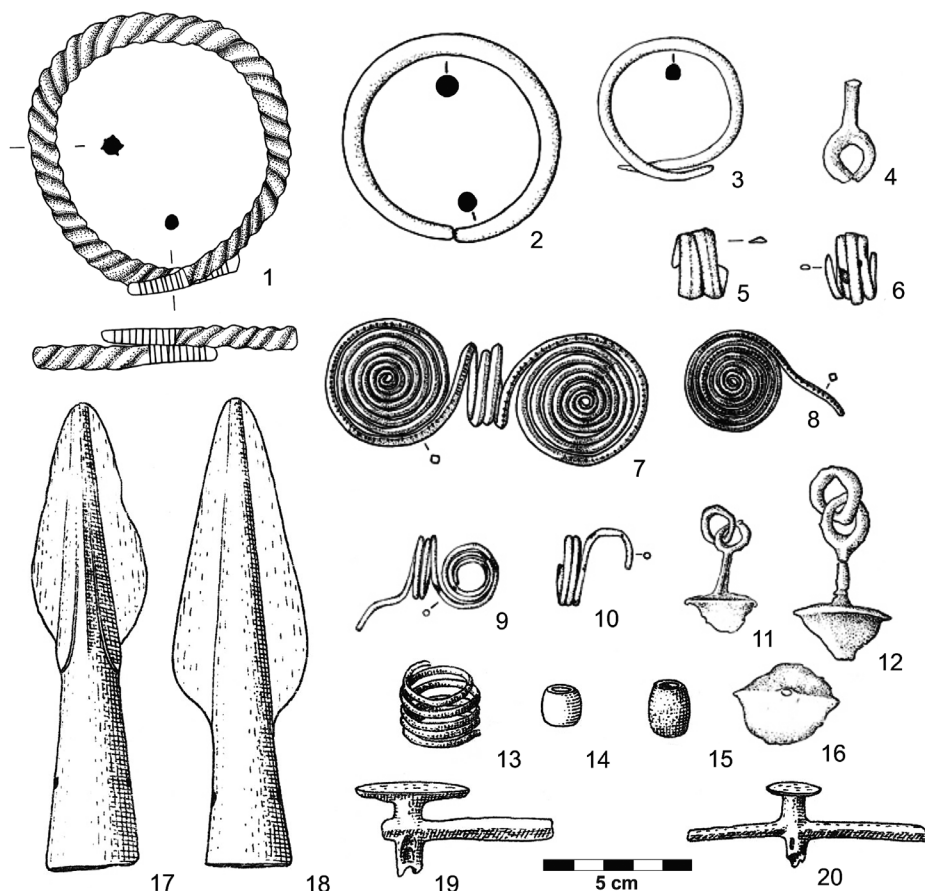


Fig. 1. Nižná-Lazy hoard (1– Danielová; 2-20 after Veliáčik 1983; Makarová 2010)

The difference can also be noticed in the contents of trace elements. Bronzes from Orava primarily contain nickel, arsenic, antimony, silver, and iron (in proportions of up to 0.8%), while the ankle ring in question contains trace amounts of silver, iron, and bismuth, and small amounts of arsenic (0.16%). The method of manufacture is different as well: the ankle ring was made by twisting a quadrangular bronze bar. There are not many analogical analyses available for bronze artefacts linked with the Lusatian culture. The analysed bronzes from the upper Vistula basin (the Nida and Sieniawa groups), dated to BrB-HaA2, also have low contents of Au and Ag (Blajer, Kowalska, Reczyński 1998). Similar results were obtained for discs and pendants from the “hoard” from Radymno in Jarosław District, dated within phases BrD-HaA1 (Biborski 2016).

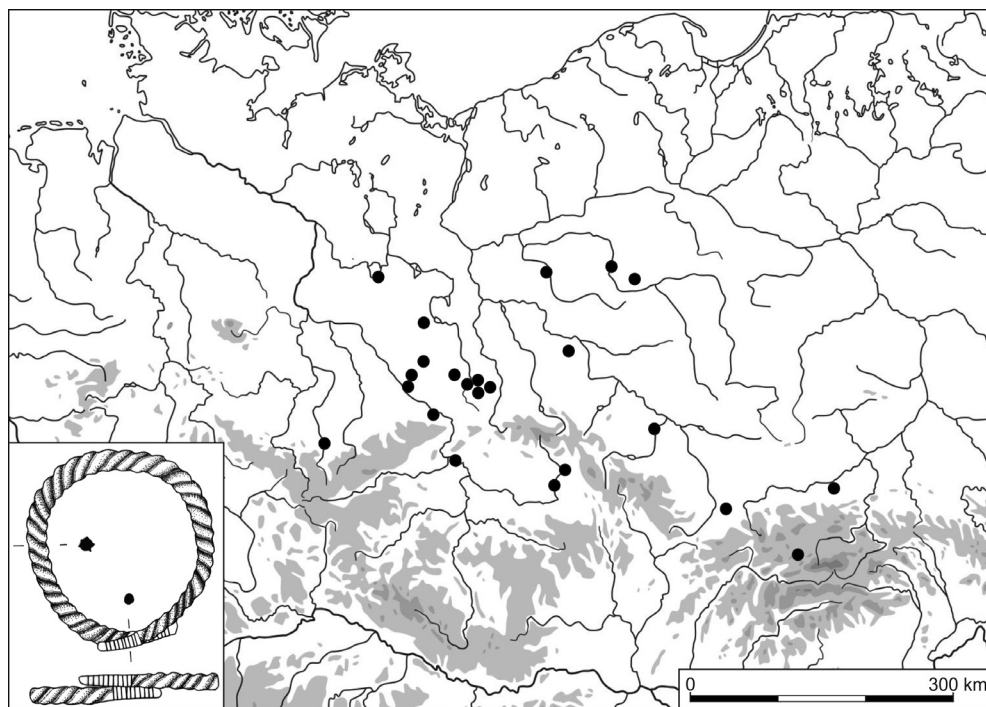


Fig. 2. Distribution of twisted ankle-rings with narrowing ends (after Brunn 1968; Salaš 2005; Kytlicová 2007; Blajer 2013)

Table 1. Percentages of chemical elements in the analysed artefacts

%	Cu	Sn	Ti	Co	Zn	Ni	As	Fe	Bi	Ag	Sb	Pb
Nižná-Lazy	91,25	7,50	0,05	0,05	0,06	0,19	0,16	<0,01	<0,02	<0,02	0,15	0,08
Dolný Kubín II	89,31	7,75	0,07	0,027	0,16	0,14	0,16	0,36	0,06	<0,04	0,21	0,92
Krásna Hôrka- „Necklace“	84,52	10,2	0,10	0,027	<0,04	0,36	0,48	0,33	<0,05	0,29	0,89	1,58
Krásna Hôrka- Bracelet	88,09	11,7	<0,05	<0,02	<0,07	<0,03	<0,03	<0,04	<0,06	<0,06	<0,08	0,12
Krásna Hôrka- Ribbed ornament	89,10	7,42	<0,05	<0,02	0,09	0,23	0,42	0,48	<0,08	0,16	0,51	0,96

The results of comparative analyses suggest that the ankle ring in question may have originated from the territory of present-day Poland. Another aspect important for this interpretation is the location of the site on the route of contact among Hallstatt-period communities (Benediková 2017). There are no other finds nearby that could be dated to the Younger Bronze Age.

IV. HALLSTATT PERIOD

The archaeological record indicates an uninterrupted continuity of occupation in Orava starting from the Bronze Age. In the Hallstatt period, the occupation shifted to higher grounds, where fortified settlements and strongholds were established.

No Lusatian culture sites have been recorded in the Slovakian-Polish borderland, although this probably stems from the state of research. Regular surface surveys have not covered the whole of the region, since much of it is inaccessible mountain terrain with no arable land. Regular excavations have not been carried out in Upper Orava, except on the shores of the Orava reservoir. The Podhale region was surveyed within the framework of the Polish Archaeological Record project, but no pottery finds assignable to the Bronze Age or the Hallstatt period have been found.

Strongholds

Nevertheless, Lusatian culture strongholds and upland settlements have been found in Poland, confirming the continuity of occupation up to the La Tène period (Gedl 1976). Those situated along the Dunajec, Skawa, and Raba Rivers were investigated from the beginnings of the 20th century, but mainly from the 1950s onwards. The sites on the Dunajec River include Zabrzeż-Babia Góra, Maszkowice, Kurów-Góra Zamkowa, and Marcinkowice, and on the Skawa there are Gorzeń Górny-Grodzisko and Zembrzyce-Zamczysko, Poznachowice Górne-Grodzisko and Klasztorzysko are the sites on the Raba River (Gedl 1976). Given that they were excavated long ago, one should approach the chronology of these sites with caution. The currently investigated stronghold at Maszkowice is an exception in this respect (Przybyła, Skoneczna 2011).

All of the above sites form a dense network of Lusatian culture settlement, similar to that recorded in Orava in the Hallstatt period. In the La Tène and Roman periods, in a period marked by the expansion of the Púchov culture, the occupation concentrated in the Skawa River valley. This is indicative of the transmission of cultural influences, or physical migration of Púchov culture communities, from Orava (Pieta 1982; Madyda-Legutko 1996, 47-51). A different situation was recorded in the valley of the Poprad River, where no Púchov culture

occupation has been recorded to confirm the spread of this cultural unit towards Spiš (Cabalska 1982: 361).

In Orava, strongholds and upland settlements have been discovered south of Nižná, on the Orava River (Nižná-Ostražica, Podbiel-Biela skala, Sedliacka Dubová, Oravský Podzámok, Mokrad', Medzibrodie, Veličná, Istebné, Tupá skala, and Ostrá skala), further towards Liptov at Tupá skala, and Ostrá skala, and at Istebné and Veličná in the direction of Turiec (Fig. 3). In Upper Orava there is a stronghold at Ostražica,² with two hoards discovered in its vicinity: a Late Bronze Age hoard at Medvedzie and a Hallstatt-period hoard at Krásna Hôrka.

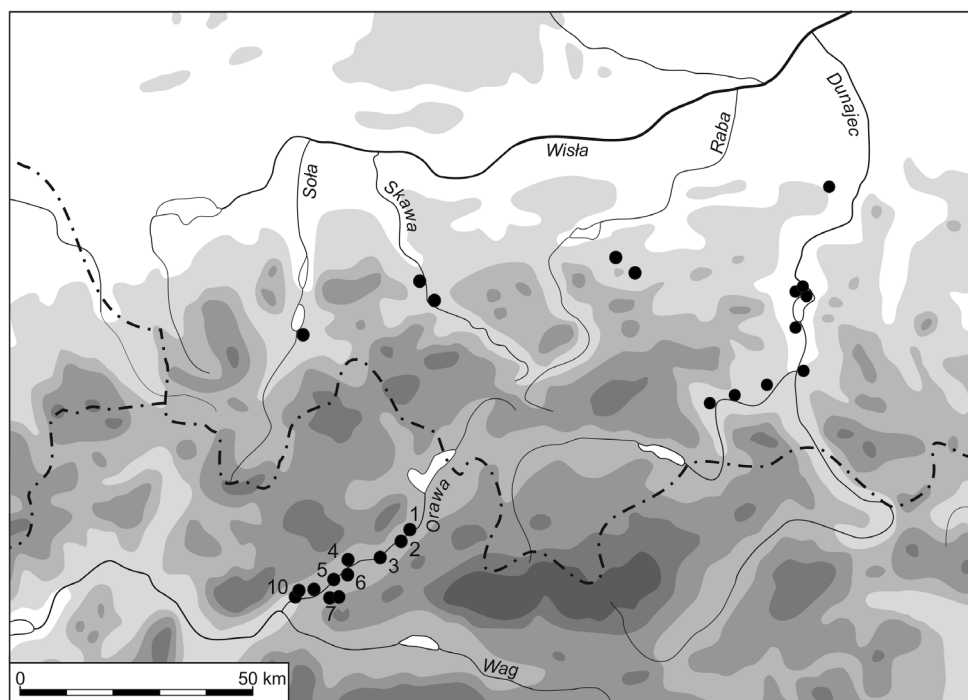


Fig. 3. Lusatian culture strongholds and upland settlements: 1 – Nižná; 2- Podbiel; 3 – Sedliacka Dubová; 4 – Oravský Podzámok; 5 – Mokrad'; 6 – Medzibrodie; 7 – Vyšný Kubín – Ostrá skala; 8 – Vyšný Kubín-Tupá skala; 9 – Veličná; 10 – Istebné (after Čaplovič 1987; Gedl 1976)

² The archaeological research of 2018 (B. Danielová and L. Záhorec) did not reveal any occupation earlier than the Púchov culture (14C dates). Although artefacts retrieved during older excavations (in the 1960s) suggest an earlier chronology, this would require further research to confirm.

Hoard from Krásna Hôrka

With respect to the Krásna Hôrka hoard, connections with the north have long been suggested in the literature (Żurowski 1927; Čaplovič 1987; Pabst-Dörrer 2000; Benediková 2017, 351). Among places geographically close to Orava, the most recent archaeological materials come from large rescue excavations initiated in 2003 and carried out for many seasons in connection with the construction of the Świnna Poręba reservoir on the Skawa River. During this research, a hoard was discovered at Zagórze in Wadowice district (site 8). It contained pseudo-twisted necklaces with ends hammered flat and formed into rolls decorated with dotted motifs (known as the Kujavia type: (Kostrzewski 1964, 20), bracelets made from bronze ribbon with ends wound spirally into loops, and a binocular brooch with the bow in the shape of figure-of-eight set between spiral plates, with a bronze tutulus in the centre (Blajer et al. 2018, 319-338).

S. Pabst-Dörrer classified multi-segment binocular brooches with tutuli according to the tutulus shape and termination, with the Zagórze brooch assigned to the Strzebielinko type typical primarily of the Baltic Sea basin (Pabst-Dörrer 2000, map 1). The Zagórze brooch was the only such artefact discovered so far to the south.

She also distinguished the Krásna Hôrka type, which only differed from the Strzebielinko type in the spherical shape of tutulus termination (Fig. 5: 6). Brooches of this type are known from Świdnik (Dist. Nowy Sącz), Świdnik (Dist. Limanowa), and Gorzyce (Dist. Tarnów) on the lower Dunajec River, from Biała Wielka (Dist. Częstochowa), and from the eponymous site of Krásna Hôrka in Orava (Fig. 4; Pabst-Dörrer 2000, list 2).

Except for a different variant of binocular brooch, the inventory of the Krásna Hôrka hoard was the same as in Zagórze (Fig. 5: 1-9). The similarities concern first of all the motifs featuring on the flattened terminations of necklaces (dotted zig-zag lines). Apart from the artefacts mentioned above, the hoard included massive rings made from bronze bar, linked in a chain (similar to ankle rings of the Nowy Sącz type; Fig. 5: 9; Żurowski 1927, 57; Pabst-Dörrer 2000, map 5 list 4a), iron axes of quadrangular section (Fig. 5: 5), and “necklaces” made from bronze wire (Fig. 5: 1, 2).

Some of the artefacts (a bracelet, a necklace fragment, and an arm ring), made accessible by the National Museum in Martin, have been subjected to chemical analysis³ (Table 1; Fig. 5: 2, 4, 7; Fig. 6). The analyses were performed using the SPECTROMAXx metal analyser, in places cleaned from corrosion.

As it was the case with the bracelets from Zagórze (Blajer et al. 2018), the spiral bracelet with the ends rolled up into small loops (Fig. 5: 4) had been ham-

³ Only 3 artefacts (spiral bracelet, arm ring and a necklace fragment) were analysed. The remaining objects from the hoard are part of a long-term exhibition in Bratislava Castle.

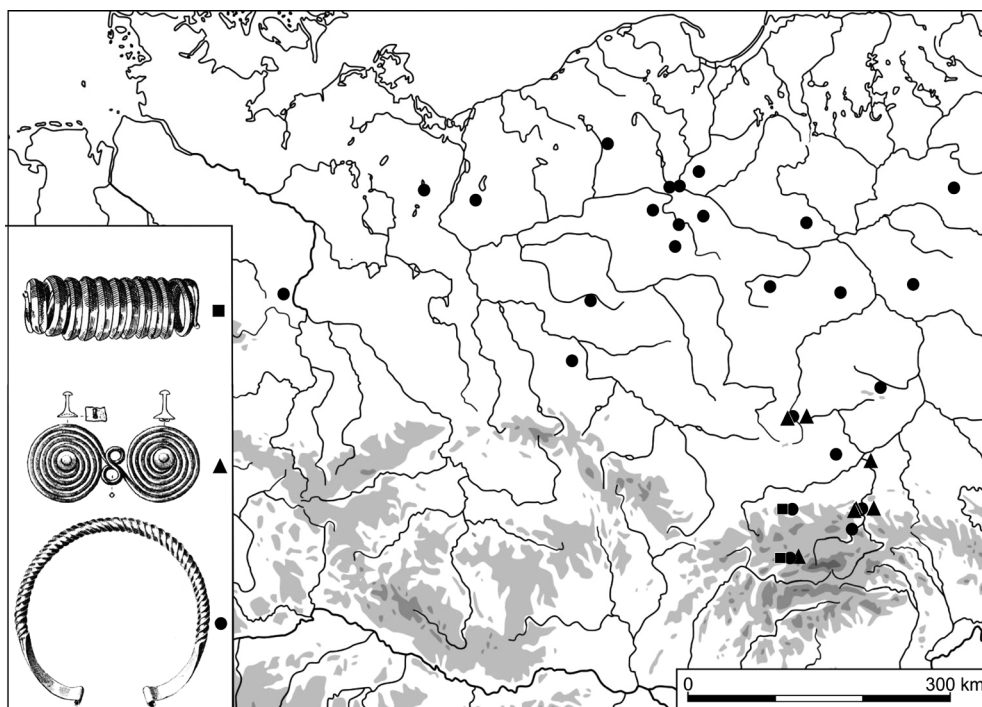


Fig. 4. Distributions of binocular brooches of the Krásna Hôrka type, necklaces of the Kujavian type, and spiral bracelets made from triangle-sectioned bronze ribbon (after Pabst-Dörner 2000 supplemented with the site of Zagórze after Blajer et al. 2018)

mered using a stencil. In terms of chemical composition it can be described as tin bronze (88.09 % Cu and 11.7% Sn). The contains of trace elements was very small (< 0.07%), and these included small amounts of lead (0.12%). The results are comparable with those obtained for the bracelets from Zagórze site 8, bracelet no. 3 in particular (Blajer et al. 2018, Table 1).

The long multi-spiral ribbed ornament terminating in a spiral made from bronze ribbon (Fig. 5: 7) represents a form which was typical of the Slovakian group of the Lusatian culture from as far back as the Younger Bronze Age (e.g. the Osádka hoard) and which also occurred in the south of the Carpathian Basin (Studeníková 2000, 64). The chemical analysis showed that it was manufactured from a different bronze than the bracelet (89.10% Cu and 7.42% Sn), with higher contents of Pb (0.96%), Sb (0.51%), Fe (0.48%), As (0.42%), and Ag (0.16%). The chemical composition is very similar to the necklace from Dolný Kubín (Table 1).

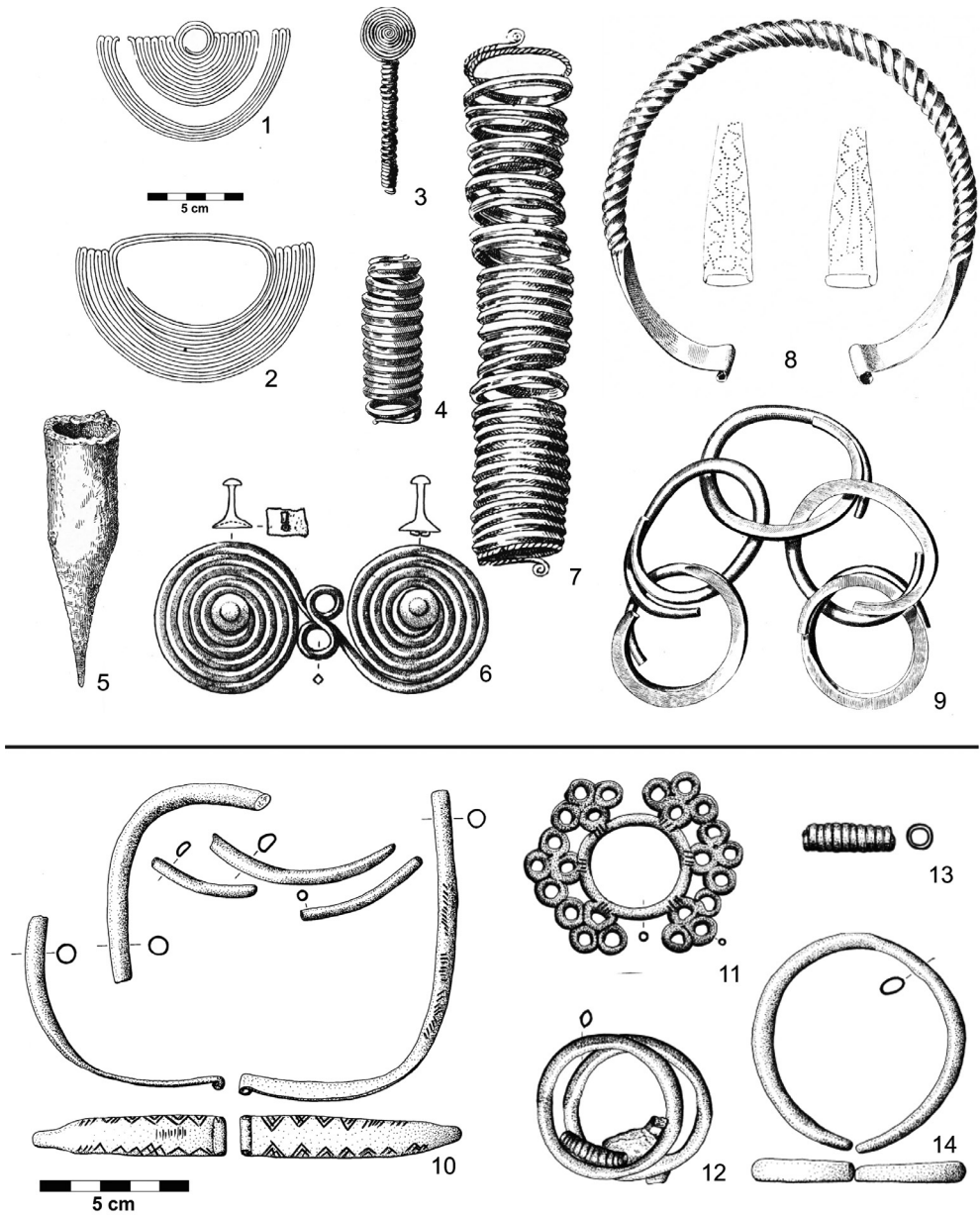


Fig. 5. Selected artefacts from the Krásna Hôrka hoard (1-9) and grave 116 from Dolný Kubín II (10-14) (after Kubínyi 1892; Benediková 2017)



Fig. 6. Artefacts from the Krásna Hôrka hoard subjected to the metallographic analysis (Slovenské národné múzeum v Martine).

Photo: B. Danielová

The twisted bronze bar believed to be a necklace (Kubínyi 1892; Čaplovič 1987, 173) finds best analogies in the site of Babinec, Dist. Rimavská Sobota (Paulík 1965, Tab. XIV: 2, 3). It resembles raw material used for manufacture of ring ornaments. Its chemical composition is very close to that of the multi-spiral ribbed ornament and necklace from Dolný Kubín. Most likely, these are products of one metallurgic centre.

Another hoard dated to the turn of the Hallstatt and La Tène periods was discovered at Istebné (Kubínyi 1902). It is comprised of artefacts occurring in the Eastern Hallstatt circle and in the early La Tène period (Benediková 2006, 103).

Cemetery of Dolný Kubín II

This is a Late Bronze Age and – primarily – Hallstatt period cemetery in which certain northern elements and cultural influences are evident. Grave 136 (Čaplovič 1977, 99) contained a necklace with the ends hammered flat and wound into rolls, bracelets made from bronze bars, ankle rings of the Nowy Sącz type, spiral tubes, and other artefacts (Fig. 5: 10-14). The grave also contained circular pendants, representing a quite widespread type occurring also in cemeteries, although first of all in Orava (Žaškov, Tupá Skala, Podbiel, Dolný Kubín II, Istebné). Analogical

pendants are known for example from Blatnica-Sebeslavce, Dist. Martin (Turiec, northern Váh River basin)⁴ (Żurowski 1927, Ryc. 14).

The narrowed ends of the necklace from Dolný Kubín (Fig. 5: 10) feature a specific decoration in the form of incised hatched triangles and vertical notches. The flattened ends raise associations with the necklaces from Kujavia, although the Dolný Kubín necklace is not twisted.

The chemical examination revealed that the artefact differs in terms of chemical composition not only from the Zagórze necklaces (Blajer et al. 2018, 330n) but also from bronze artefacts retrieved from other graves in Dolný Kubín II cemetery (Table 1). The Cu content was 89.31%, Sn 7.75%, and the identified trace elements included antimony and a small proportion of silver. The necklace was cast using the lost wax technique and then was hammered along its entire length, analogically to the necklaces from Zagórze (Blajer et al. 2018, 331).

Other graves at Dolný Kubín II yielded artefacts typical of the Hallstatt period. Grave 112 (Čaplovič 1977, 93) contained cast bronze bracelets, a massive necklace with the ends wound into rolls, and cast bronze buttons having analogies in the Eastern Hallstatt zone, where they occur in phase HaC (Benediková 2017, 347). The grave also contained nail-shaped earrings with a conic head, widespread in the forest-steppe zone in the Hallstatt period. In Central Europe they are known from the sites of the Vysocko and Tarnobrzeg Lusatian cultures, and from the basin of the Tisa River, where they date to HaD (Chochorowski 1985: 65; Mirošayová 2012: 258 – 259).

Among finds from grave 246 (Čaplovič 1977, 63 – 65), worthy of note are clay animal figurines (beads), which find analogies in Vyšný Kubín (Čaplovič 1987, pl. LXVIII: 1, 2, 4) and beyond Orava, in the Baczyn cemetery near Kraków (Prokopowicz-Krauss 1967, 133 – 159; Benediková 2004, 112, fig. 5).

Pins

It is worth mentioning that pins characteristic of the Górnośląsko-malopolska (Upper Silesian – Lesser Poland) group occurred throughout the Hallstatt period, and in northern Slovakia also in the La Tène period, while in other territories brooches were prevalent (Makarová 2010, 16). The majority of pins discovered in Lesser Poland date to HaC and HaD periods, and those with the heads rolled into a spiral disc were the most characteristic variant (Durczewski 1946, 92).

Bronze pins with the head formed into two spirals occurred in quite large numbers in Orava and Liptov during the Hallstatt period. They represented

⁴ As noticed long ago by Józef Żurowski (1927, 65-71), the pendants from another site in Blatnica (Dist. Martin) find analogies in Świdnik (Dist. Limanowa). These artefacts can be seen as evidence for contacts between Lesser Poland and the northern Váh basin.

a variant with a thickened head and flattened shaft. Smaller variants are known from Vyšný Kubín, Liptovský Mikuláš-Ondrašová (Novotná 1980, pl. 47) and Rohačka (Furman 2016, 181-183), while larger examples have been found in Istebné, Malatíny, and in the Orava River (Novotná 1980, pl. 47). In Moravia, one such pin is known from Dobšice (Říhový 1979, pl. 47: 1864). Pins of the discussed type have been found in several sites in Poland: Stanomin (Durczewski 1961, 61, fig. 53), Kołuda Mała, Szarlej, Dist. Inowrocław, Orchowo, Dist. Mogilno (Durczewski 1948, figs 29, 36), Dęby, Dist. Aleksandrów (Kostrzewski 1964, fig. 17), and Rudawa, Dist. Kraków (Rydzewski 1995, figs 35, 106).

The chronology of pins in Slovakia is determined by the variants with the head formed into two spirals and with a flattened shaft, which find parallels in Polish sites. Analysing their geographical distribution one can notice that in Central Europe this type is characteristic of the Lusatian culture in the Hallstatt period, with concentrations in Liptov and Orava, and in Kujavia as well (Fig. 7). Geographically distinct clusters may represent local variants of pins, which in

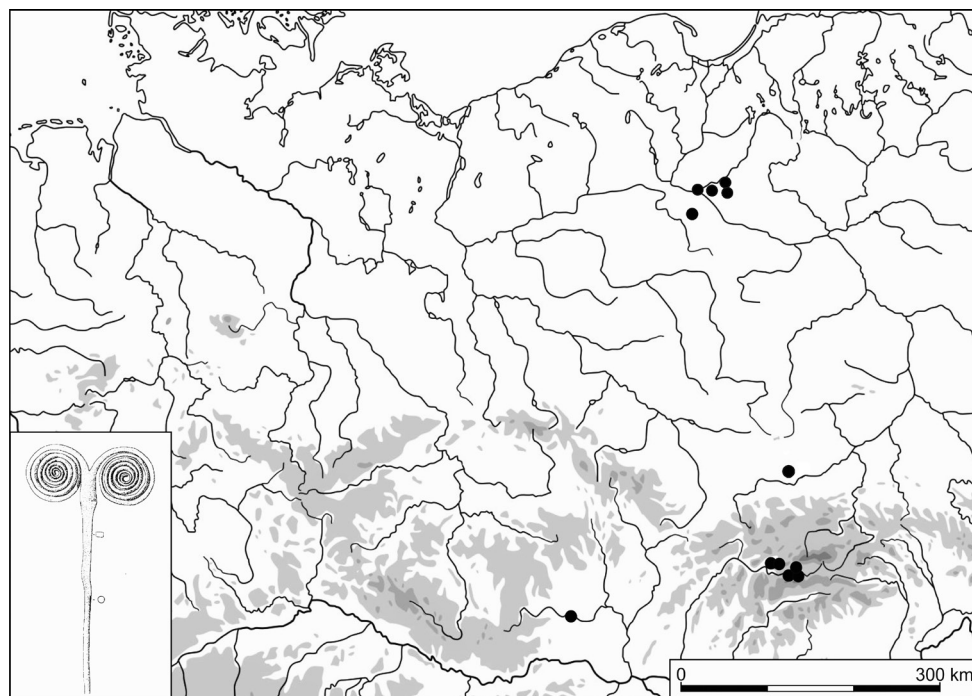


Fig. 7. Distribution of pins with the head in the form of two spirals and with flattened shaft in the Hallstatt period (after Durczewski 1948; Durczewski 1961; Kostrzewski 1964; Novotná 1970, Říhový 1979, Rydzewski 1995)

Kujavia typologically developed from HaC pins with one spiral disc (Kostrzewski 1954, 62-64; Durczewski 1961: 83f) and in northern Slovakia were already known from Younger Bronze Age graves (Novotná 1980: 95). The objects discovered outside the mentioned range, such as Rudawa, Dist. Kraków or Dobšice in Moravia, should probably be interpreted as reflecting cultural connections rather than as imports.

V. DISCUSSION

As Lusatian culture pottery formed distinct local groups in the Late Bronze Age, mutual connections can be inferred first of all from the finds of metal artefacts. The pottery diversity had a very local nature, often connected with a particular site (Danielová 2017, 79). S-shaped, profiled amphorae occurring in the Prokocim-Skotniki phase (Gedl 1982, 24-26) resemble vessels from the Slovakian group of the Lusatian culture. They differ from biconical vessels characteristic of the Górnooląsko-malopolska group. The vessels in question date to Bronze Age Period V, which corresponds with phase HaB2-HB3 for example in Targowisko, Dist. Wieliczka, grave 2026 (Konieczny 2014, pl. 250).

In territories where no major Hallstatt culture influences were recorded in phase HaC, local groups were even more distinct, and differences in pottery manufacture became even more pronounced. The Orava group is a good example in this context, with pottery in each of the sites having distinct local traits (Podbiel, Dolný Kubín II). It is worth mentioning that except for thick-walled pots, the HaC pottery finds no close analogies. Ceramic materials from the Slovakian-Polish borderland have not been sufficiently analysed, and they require further studies in the future.

VI. SUMMARY

In the Younger Bronze Age, bronze artefacts usually had wide distributions and were relatively uniformized within the extensive area occupied by Urnfield cultures. They speak of cultural connections only to a very limited extent. Among the collection of bronze objects from Orava, the only element of possibly northern provenance is the twisted ankle ring with tapering ends from Nižná, which finds analogies in the Elbe and Vistula basins.

The situation looks different in the Hallstatt period. In the Carpathian Basin, influences from the Eastern Hallstatt, Lusatian, Vekerzug, and Kuštanovice cultures interfere, which is reflected in bronze artefacts originating from hoards and cemeteries in Orava. With respect to the Krásna Hôrka hoard and the Dolný Kubín II cemetery we can speak of artefacts imported or adopted from the north, most

likely from the Sącz Basin where analogies have been found in the form of ankle rings of the Nowy Sącz type and binocular brooches of the Krásna Hôrka type.

The production method and chemical composition of the multi-spiral bracelet made from triangle-sectioned bronze ribbon from the Krásna Hôrka hoard are akin to that of bracelets from Zagórze site 8 (88.09% Cu and 11.7% Sn, with no significant amount of trace elements). Analogies suggest that a metallurgical centre with northern traits (Greater Poland, Kujavia) probably existed in the West Carpathians. The chemical composition of the multi-spiral ribbed ornament from bronze ribbon and the pseudo-twisted necklace from Krásna Hôrka, and the necklace from Dolný Kubín is different (89.10% Cu and 7.42% Sn, with increased amounts of Pb, Sb, Fe, As, and Ag), which is possibly indicative of another centre situated in the West Carpathians, this time with southern traits (Carpathian Basin).

It would be interesting to examine the remaining artefacts from the Krásna Hôrka hoard (first of all the pseudo-twisted necklaces with flattened ends decorated with dotted zig-zags) and then compare them with the Zagórze hoard.

The analogies for clay figurines discovered in the Baczyn cemetery (Benediková 2004, 112) provide further evidence that, despite being materially divided into the Górnooląsko-malopolska and Orava groups, the Lusatian culture in the borderland zone shared common cultural elements.

The Slovakian-Polish borderland is an area of enormous potential for research. Trade routes linking Lesser Poland with the Carpathian Basin probably passed through the Carpathians along rivers and streams. Based on the distribution of bronze artefacts revealing southern connections in the upper Vistula basin, W. Blajer (2014) identified the routes which most likely allowed for Transcarpathian north-south communication in the Younger Bronze Age (via the Dukla Pass to the Wisłoka River valley and along the Poprad and Dunajec River valleys) and the Late Bronze Age (also along the valleys of the Orava and Skawa Rivers).

As emerges from this paper, mountain routes probably played a major role in the Hallstatt period as well, allowing for north-south communication via Orava through the Váh River valley to the Carpathian Basin, and eastwards to the Liptov region.

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Address of the Author

Barbora Danielová

Orava museum of Pavol Országh Hviezdoslav

Oravský hrad

027 41 Oravský Podzámok, Slovakia

e-mail: archeologia@oravskemuzeum.sk

