

## ANNULAR FIBULAE OF THE LATE ROMAN PERIOD IN BOHEMIA<sup>1</sup>

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**Abstract:** In this paper, the authors take an interdisciplinary approach to evaluate annular fibulae of the Late Roman period in Bohemia. The dating of these artefacts is not entirely clear and ranges from the end of the 3<sup>rd</sup> century to the end of the 4<sup>th</sup> century, with a likelihood of continued use during the 5<sup>th</sup> century. This specific type of fastener can be divided into finds of Roman-provincial origin and products of barbarian workshops. The Roman-provincial annular fibulae show typological diversity and likely originate from Pannonian workshops. The barbarian fibulae can now be divided into the classic Böckingen type and the newly identified Skorkov variant, typical for Bohemia and Central Germany. Although the two main groups differ technologically in their surface treatment (tinning on the Roman-provincial products), metallography reveals no significant differences between them. The majority of the fibulae were made of tin lead brass (CuZnSnPb) with a low concentration of zinc and indicating the recycling of brass artefacts and objects made of other copper alloys which occurred both in the Roman provinces and in Barbaricum. A contextual analysis of these fibulae produced important information. Only a small percentage of the artefacts come from graves or settlements with a heavy predominance of isolated finds at distinctive locations. To a certain extent, these could be typologised and interpreted as “sacred monodeposits”.

### INTRODUCTION

When one of the authors of this paper was preparing to publish the Roman-provincial fittings of a yoke from an older assemblage (allegedly a cremation grave) from Nebovidy near Kolín, he came across a photograph of a mysterious artefact which in time proved to be an annular fibula (Ringfibel in German), an unprecedented find in Bohemia at that time (Beneš 2018). Sadly, the artefact could no longer be located at the Regional Museum in Kolín. However, thanks to information and impulses from Moravian colleague M. Popelka (Institute of Archaeological Heritage Care in Brno – ÚAPP Brno), news began to emerge of other similar finds, albeit those made by amateur metal detector hunters. The first such find from Skorkov in Central Bohemia served as motivation to search for additional similar artefacts (Beneš 2019). Gradually, thanks in large part to cooperation with amateur collaborators, it was possible to collect a total of 14 specimens from Bohemia and one specimen that came to the National Museum as a gift from Galicia back in the 19<sup>th</sup> century.<sup>2</sup> Nearly all of them were found in Czech museum collections, together with the remarkable circumstances of their find contexts.

While we still encounter the interpretation of this artefact as a belt buckle in older studies (Böhme 1972, 46; Jobst 1975, 126; Oldenstein 1977, 218), based on an in-depth study of these finds in Pannonia by I. Sellye, it would seem that these were mainly clothing fasteners (Fazekas 2008, 324; Sellye 1990, 36–47, Taf. I). In reality, annular fibulae have relatively ancient roots: they are recorded as far back as the Early Iron Age (Heynowski 1998), and their predecessors include omega fibulae, known already in the Early and Late Roman Period, both in Roman-provincial territory (Böhme 1972, 46; Jobst 1975, 124) and in Barbaricum. Their development continues even in later periods, and they therefore occur in various regions of Europe into the Middle Ages (Teegen 1998, 339–341). The following is a discussion of annular fibulae with an extension (Ringfibel mit Ansatz in German) documented thus far in Bohemia and which date to the Late Roman Period or even the beginning of the Migration Period. Typologically, we can speak of Roman-provincial and barbarian (Germanic) specimens.

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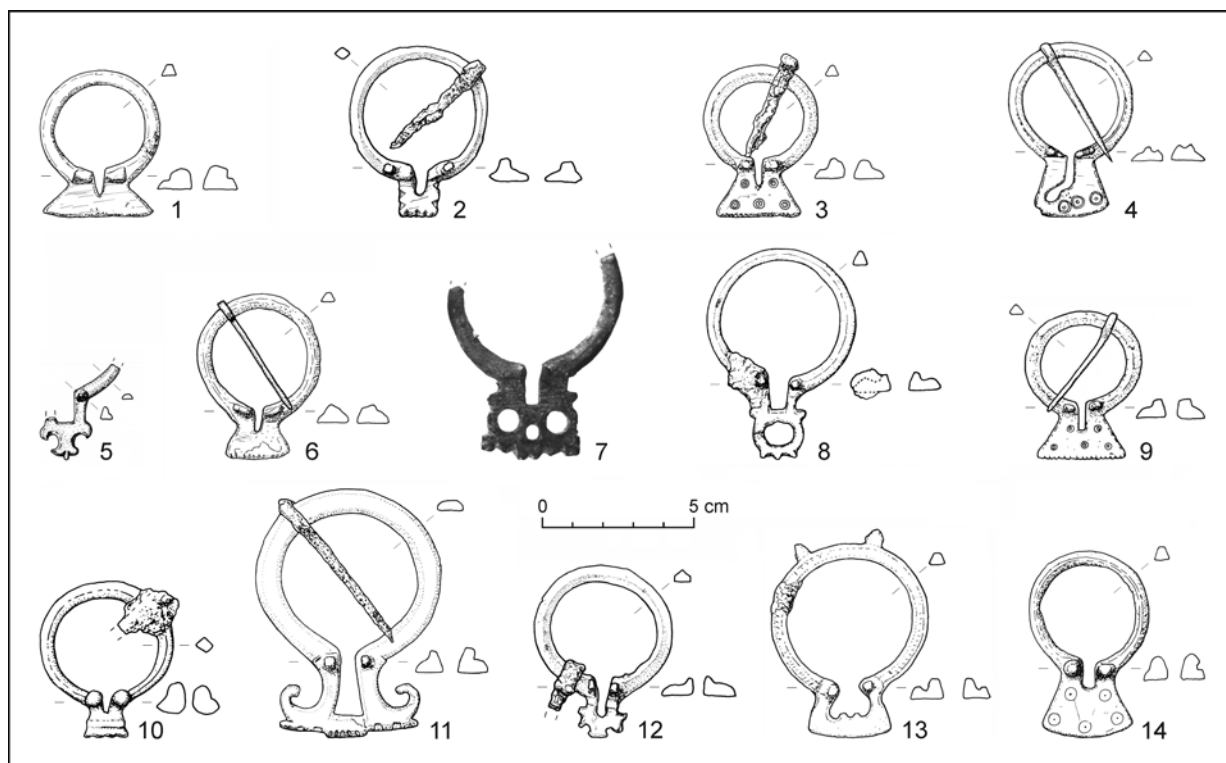


Fig. 1. Annular fibulae from the Bohemia and Ukraine. 1 – Dobřichov; 2 – Hradištko u Sadské; 3 – Hřešice; 4 – Jirkov-Červený Hrádek; 5 – Lipec; 6 – Málkov u Chomutova; 7 – Nebovidy; 8 – Pálež u Milešova; 9 – Skorkov; 10 – Úvaly u Prahy; 11 – Vroutek; 12 – Ždánice u Kouřimi; 13 – Žehuň; 14 – Balicze. Drawings by Z. Beneš.

### ROMAN-PROVINCIAL ANNULAR FIBULAE WITH A PROFILED PLATE

Beginning with the study by *I. Sellye* (1990), Roman-provincial specimens of fibulae with a distinctive support plate are usually connected with the province of Pannonia (*Fazekas* 2008, 327; *Schmid* 2010, 52; 53). They are found considerably less often in neighbouring territories – we can name examples from Dacia (*Cociș* 2004, 129; 130, pl. CXI: 1568–1572), Noricum (*Jobst* 1975, 125–127, tab. 51–53), Raetia (*Pröttel* 2002, 101–103, Taf. 5: 62), the Upper Germanic-Raetian Limes (*Böhme* 1972, 46, Taf. 31: 1232–1233) and the Moesian Limes (*Petković* 2018, 86; 87). They appear in exceptional cases even further past the Rhine (*Teegen* 2013). Certain areas in Pannonia can also be distinguished where finds are concentrated – in addition to Intercisa and Brigetio, this is mainly Savaria, which, based on finds of semi-finished products, is even considered a production centre of this type of fastener (*Fazekas* 2008, 327, 328; *Merczi* 2000, 263; *Sellye* 1990, 27–32). A semi-finished annular fibula with a plate was also found in Poetovio/Ptuj in modern-day Slovenia (*Merczi* 2000, 263). All of the Roman-provincial specimens presented here (Hradištko u Sadské, Lipec, Nebovidy, Pálež u Milešova, Úvaly u Prahy, Vroutek, Ždánice u Kouřimi) can be typologically designated as the *Jobst* 35B/*Böhme* 51d/*Cociș* 27b/*Merczi* var. 3 type. A more precise typology of these fibulae comes from the aforementioned

Table 1. Summary of typological determination of annular fibulae in Bohemia.

| Site                  | Typology   |
|-----------------------|------------|
| Balicze (UA)          | Skorkov    |
| Dobřichov             | Böckingen  |
| Hradištko u Sadské    | Sellye I   |
| Hřešice               | Skorkov    |
| Jirkov-Červený Hrádek | Skorkov    |
| Lipec                 | Sellye IV  |
| Málkov u Chomutova    | Skorkov    |
| Nebovidy              | Sellye VII |
| Pálež u Milešova      | Sellye VI  |
| Skorkov               | Skorkov    |
| Úvaly u Prahy         | Sellye II  |
| Vinařice u Loun       | Skorkov    |
| Vroutek               | Sellye II  |
| Ždánice u Kouřimi     | Sellye IV  |
| Žehuň                 | ? (Roman)  |

I. Sellye, according to whom it is possible to add to type I – known also as the Siscia variant after *R. Koch* (1974) – the fibula from Hradištko u Sadské (Fig. 1: 2), to type II the fibulae from Úvaly u Prahy (Fig. 1: 10) and Vroutek (Fig. 1: 11), to type IV specimens from Lipec (Fig. 1: 5) and Ždánice u Kouřimi (Fig. 1: 12), to type VI the fibula from Pálec u Milešova (Fig. 1: 8) and to type VII (Table 1) the lost find from Nebovidy (Fig. 1: 7). The fibula from Žehuň (Fig. 1: 13) deviates from I. Sellye's classification. Nevertheless, the formal spectrum of these fibulae is so broad that there is always a specimen that has not yet been found elsewhere (*Teegen* 2013, 319). Still, some specimens from Bohemia have relatively close analogies in the provinces. For example, the extraordinarily large fibula from Vroutek has very close parallels in Brigetio (*Sellye* 1990, 31, Taf. 2: 13), Vienna (*Schmid* 2010, 122, Taf. 38: 299) and Trier (*Teegen* 2013, Abb. 2). The fibula from Nebovidy has a good analogy in Styrian Dietersdorf (*Heymans* 1996, 151, Taf. 11: 37) and is also similar to a fibula from Vienna (*Schmid* 2010, 128, Taf. 43: A20).<sup>3</sup>

Roman-provincial annular fibulae with a profiled plate are generally dated to the period between the second half of the 3<sup>rd</sup> century to the course of the 4<sup>th</sup> century (*Merczi* 2000, 263, 264; *Sellye* 1990, 26, 27, 75, 76), although the simpler Sellye I/Siscia type (*Koch* 1974, 232, Taf. 1: 10, 11) could be dated more precisely in several cases to the first half of the 4<sup>th</sup> century (e.g. *Pröttel* 2002, 103). Based on their occurrence near the Limes, some scholars attribute these fibulae to the army milieu, where they were to be used to fasten military cloaks (*Cociş* 2004, 130; *Pröttel* 2002, 103, Abb. 4; *Schmid* 2010, 53), though this obviously is not the only possible interpretation (*Teegen* 2013, 323; 324), since they have also been found in the graves of women and children in several cases (*Fazekas* 2008, 329, tab. 1; *Merczi* 2000, 263). Their deposition on the right shoulder of the deceased is typical (*Fazekas* 2008, 328), but sometimes they are found in another position, e.g. in the lumbar region (e.g. grave 34 from Somogyszil, graves 79 and 81 from Intercisa), and as such they could have also served a different function, e.g. to fasten grave clothes (*Fazekas* 2008, 329).

An important grave unit with a Roman-provincial variant of an annular fibula with an extension is an inhumation burial from Slížany; the artefact comes from the old collection of I. L. Červinka. The fibula was found here at the side of the skeleton and was to have served as a clasp for some kind of leather bag (*Beneš* 2018, 111, 112; *Teegen* 2013, 324; *Trnáčková* 1961). Important chronological support for this grave is a two-part crossbow fibula with a wedge-shaped foot of the Schulze 176 type, which is typical for the 5<sup>th</sup> century and was later designated as a Slížany type by the author M. Schulze-Dörrlamm (*Schulze* 1977, 101; *Schulze-Dörrlamm* 1986, 624, 625, Abb. 34–37). A problem, however, is the similarity of these fibulae to type 177, which the same author dates back to the period between the 3<sup>rd</sup> century and the beginning of the 5<sup>th</sup> century (*Böhme* 1996, 90, 91, Abb. 2; *Schulze* 1977, 101, 102). The lone difference between the two types is the length of the winding, and if we assume that many of these two-part fibulae are only partially preserved (usually with the winding broken off), their identification cannot be entirely positive, as shown by *Droberjar et al.* (*Droberjar/Knápek/Jarůšková* 2019, 123). And yet, a fire striker from the Slížany grave corresponds fully to variants from the Migration Period (*Tejral* 1982, 154, 155). As such, it appears (regardless of the actual dating of Schulze 176 and 177 fibulae) that the annular fibula in the Slížany grave can actually be an authentic artefact from the 5<sup>th</sup> century or some kind of antique piece, similar to other fibulae of this type (*Teegen* 1998, 345).

## BARBARIAN ANNULAR FIBULAE WITH A TRAPEZOIDAL PLATE

Compared to Roman-provincial types, barbarian fibulae with a trapezoidal plate logically appear much more frequently in Barbaricum. While it was previously concluded that the barbarian variants were imitations of provincial fibulae (*Zimmermann* 1972, 191), they probably underwent separate simultaneous development (*Heynowski* 1998; *Koch* 1974; *Teegen* 1998), even if a certain concurrence of development with Roman-provincial types cannot be ruled out. They are sometimes designated in the literature as the Böckingen type after an inhumation grave dated to around the year 300 discovered near a Roman castell in Baden-Württemberg (*Werner* 1938; *Zimmermann* 1972, 191).

It is clear from specimens found in Bohemia that the formal diversity of these barbarian types falls far short of the palette of Roman-provincial products. The shape of the plate is trapezoidal in proportionally different sizes. The lower edge is sometimes convex, as is the case with finds from Jirkov-Červený Hrádek

<sup>3</sup> Another noteworthy Bohemian find of a Roman-provincial annular fibula, albeit of a slightly different type (Jobst 36C/Sellye XVII), comes from Řevničov. A separate study was devoted to this find (*Vích et al.* 2022) and in this work we will take a closer look at it only in connection with its find context.

(Fig. 1: 4) and Balicze (Fig. 1: 14) and is often decorated with simple incisions. The front side is either smooth or decorated with concentric rings (usually five, though the find from Jirkov-Červený Hrádek is an exception). The cross-section of the body of the fibula is either triangular or pentangular. Returning again to the rather unusual fibula from Jirkov-Červený Hrádek, we can observe a flange-like elongated cut-out for threading the pin. It is not clear whether this feature had functional or decorative significance. It is possible that this is merely a defect resulting from the casting of this fibula.

Today it is known that these fibulae occur from Southwestern Germany (Koch 1974) to Central Germany (Walther 1998). A somewhat different variant of these fibulae predominates on the coast of the North Sea (Koch 1974, 229; Nowothnig 1970, 136–143; Teegen 1998, 345; Zimmermann 1972). In the work of H. W. Böhme, we encounter an attempt at another typological classification differentiating the original Böckingen type characterised by longer lateral extensions of the lower plate, sometimes even with cut-out upper edges, and “similar forms” with a narrow trapezoidal plate and which are concentrated mainly in Central Germany (Böhme 1986, 488–490, Abb. 17; Walther 1998, Abb. 5). The Bohemian specimens of these fibulae mostly correspond to this Central German variant, and only the find from Dobřichov (Fig. 1: 1) with its wider plate suggests an affiliation with the original Böckingen type. In order to emphasise the concentration of fibulae with a narrow trapezoidal plate in Bohemia and Central Germany, we designate them here as the Skorkov type. We will set aside for now whether it makes sense to separate a third variant characterised by a convex lower edge of the plate, since the only known specimens are the fibulae from Jirkov-Červený Hrádek and Balicze.

These fibulae play a role in deliberations on the connection of Thuringia (especially its north-western territory) with the Main River region and Southwestern Germany from the end of the 3<sup>rd</sup> century and the 4<sup>th</sup> century, mainly concerning the movement of the Alamanni. One way that W. Walther (1998) documents this is through the expansion of Böckingen- and Skorkov-type fibulae, similar to H. Schach-Dörge (1997, 82, Abb. 64). In this concept, Bohemia plays a role as an outlying region of the Elbe-Germanic cultural sphere, extraordinarily close to the Central German tradition (already in Svoboda 1965, 29–42; most recently in Čistáková/Beneš 2024, 59, 60).

However, there is not a great deal of support for the dating of these annular rings. J. Werner dated the grave from Böckingen to around the year 300 despite the fact that it did not contain another well-datable find (Werner 1938). In Mainz, however, this fibula was found in the same context as a Constantine the Great coin (Koch 1974, 231).<sup>4</sup> It is interesting that some of these fibulae were also found in Migration Period graves. Does this mean that they served as some type of antique, as is considered in the case of the Roman-provincial annular fibula from Slížany? This can be contemplated in the case of a Böckingen-type fibula from a 6<sup>th</sup> century Anglo-Saxon grave in Londesborough, England (Böhme 1986, 490, Abb. 15: 5). But if the graves are from the early phase of the Migration Period, e.g. a grave from the mid-5th century from Stößen in Saxony-Anhalt (Schmidt/Bemmann 2008, 114, Taf. 146: 113/70,7), it is reasonable to ask whether Böckingen- or Skorkov-type annular fibulae could have been used longer than originally assumed.

## FIND CONTEXT

The spatial distribution of annular fibulae from Bohemia has several interesting features (Fig. 2). It is clear that finds of Roman-provincial fibulae predominate in the middle Elbe region in Bohemia. The second major area of the distribution of annular fibulae is the Ohře River region and the territory below the Ore Mountains (nearly without exception geomorphologically distinctive locations), where, in contrast, barbarian Skorkov-type fibulae predominate. This situation can be explained as follows: Roman-provincial imports apparently reached the densely settled Elbe River region more easily and in greater numbers, while, on the other hand, the north-western part of Bohemia was closer to Central Germany, where there is another large concentration of Skorkov-type fibulae (Böhme 1986, 488–490, Abb. 17; Walther 1998, Abb. 5). Of course, it is a question whether such conclusions can be reliably drawn on such a statistically insignificant assemblage.

Although two of the presented annular fibulae from Bohemia come from grave contexts, this claim is not without complications in either case. Although it is lost today, a Roman-provincial fibula with an open-work plate from Nebovidy near Kolín (Fig. 1: 7) comes from a grave uncovered in 1922 by F. Dvořák, who noted that

<sup>4</sup> The earliest evidence of this fibula is typically thought to come from grave 72 at the Preetz cemetery (Schleswig-Holstein), from the zone of the necropolis belonging to phase C1b. However, the plate from this fibula has not been preserved, thus casting doubt on the relevance of this analogy (Teegen 1998, 345).

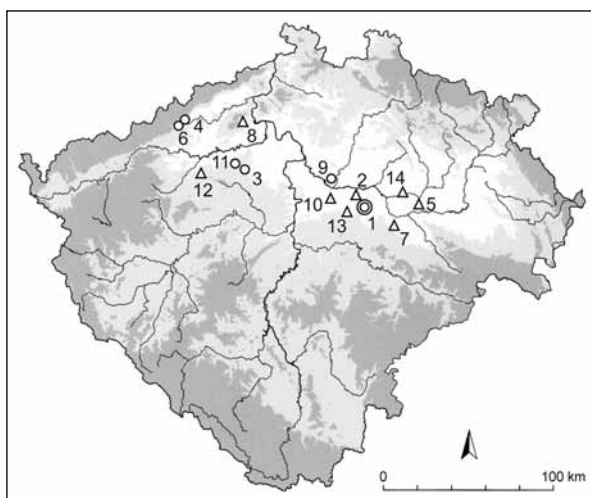


Fig. 2. Annular fibulae from Bohemia. Triangles – Romano-provincial fibulae; concentric circles – barbarian fibulae of the Böckingen type; dots – barbarian fibulae of the Skorkov type. 1 – Dobřichov; 2 – Hradištko u Sadské; 3 – Hřešice; 4 – Jirkov-Červený Hrádek; 5 – Lipec; 6 – Málkov u Chomutova; 7 – Nebovidy; 8 – Pálec u Milešova; 9 – Skorkov; 10 – Úvaly u Prahy; 11 – Vinařice u Loun; 12 – Vroutek; 13 – Žďánice u Kouřimi; 14 – Žehuň.

dating of an annular ring allegedly found here is inconsistent with the rest of the inventory, and although the author of the original publication attempted to find a suitable analogy for it from the Early Roman Period, a critical evaluation definitely rules out a dating to phase B1. The problem is that the grave unit was already described in this way by J. L. Píř (1897, Taf. 64: 25–28) and also in the accession book of the National Museum. As such, if this annular fibula was combined with the finds from Pičhora, it must have occurred at the end of the 19<sup>th</sup> century, perhaps through the mixing of finds from the later cemetery from the Třebická site, which is also near Dobřichov. For now, this is the only explanation available.

Two of the published fibulae, from Lipec (Fig. 1: 5) and Žehuň (Fig. 1: 13), verifiably come from contemporary settlement sites, even if these remain unpublished thus far. These are not finds from excavations conducted using traditional methods but by amateur collaborators using metal detectors.<sup>5</sup>

A Skorkov-type fibula that found its way into the collections of the National Museum back in the 19<sup>th</sup> century comes from the town of Balicze (today Podorozhne/Подорожнє) in the Lviv Region of modern-day Ukraine but must be assessed as having no context (Fig. 1: 14). The tale behind this artefact's journey to the National Museum in Prague is in and of itself extraordinary. The fibula was a gift from high-ranking Austro-Hungarian official Leopold Johann Nepomuk von Sacher-Masoch (1797–1874). He became interested in science from an early age, specifically geology and palaeontology, and he founded a private nature collection with items from western Ukraine. Particularly fruitful from a scientific perspective were his years in Prague (1848–1854), where he held the position of police commissioner. With his collections, Sacher-Masoch contributed to many scientific studies. In Prague, he worked closely with Joachim Barrande and became a member of the Lotos scientific association; he also supported the Institute of Geology and the natural science cabinet of the National Museum with material gifts (Svojtka 2009, 42, 43).<sup>6</sup> The aforementioned fibula was donated at the time of his cooperation with the collection-

the 'grave contained a coarsely-worked, pot-shaped urn filled with the semi-burned bones of an adult individual with a weaker constitution. Eight highly interesting bronze grave goods, identical to artefacts found at the well-known hillfort near Stradonice, were added to the grave. F. Dvořák illustrated three of these artefacts (Dvořák 1941, 11, obr. 3), including a fragment of an annular fibulae, another a Roman-provincial yoke/horse collar fitting with a harness rein guide ring and a large flat ring (Beneš 2018, 109–111, obr. 2; 3). As the remaining inventory of the grave is unknown, there is no further support for dating or an overall interpretation. But the very presence of these three artefacts in a cremation grave in Central Bohemia is in fact highly unusual.

Another grave find is a barbarian annular fibula from grave 64 from the known Early Roman Period cemetery at Dobřichov-Pičhora (Fig. 1: 1; Droberjar 1999, 143; 144, 244, Taf. 52,64/3; 109,6). In addition to a classic undecorated terrine with an offset neck, the grave also contained iron shears and a knife with a solid handle decorated with concentric rings. Among the listed grave goods, a ceramic urn can be dated most precisely – probably to phase B1. The

<sup>5</sup> For now, the lone mention of the Roman Period settlement in Žehuň is in Danielisová et al. 2018, 130, fig. 4. Based on as yet unpublished settlement finds, it can be dated from the Late Roman Period to the Migration Period.

<sup>6</sup> During his time in Prague, Sacher-Masoch was also somewhat unhappily involved in the administration of the National Museum collections (see ANM, RNM, crate no. 5, inv. no. D/7/20) and became critical of the organisation of the numismatic and archaeological collections. Between 1850 and 1854, he was a member of the museum society and a number of committees of Matice česká, which gave him an influential voice in the important work of these two organisations. His secret mission was to remove from Matice and the museum individuals active in the revolutionary years and replace them with trusted individuals. As such, in 1850 he blocked František Palacký's *Educational Dictionary* (*Naučný slovník*) project, which was followed by Palacký's removal from the museum committee in 1852 (Prokeš 1931, 23–27).

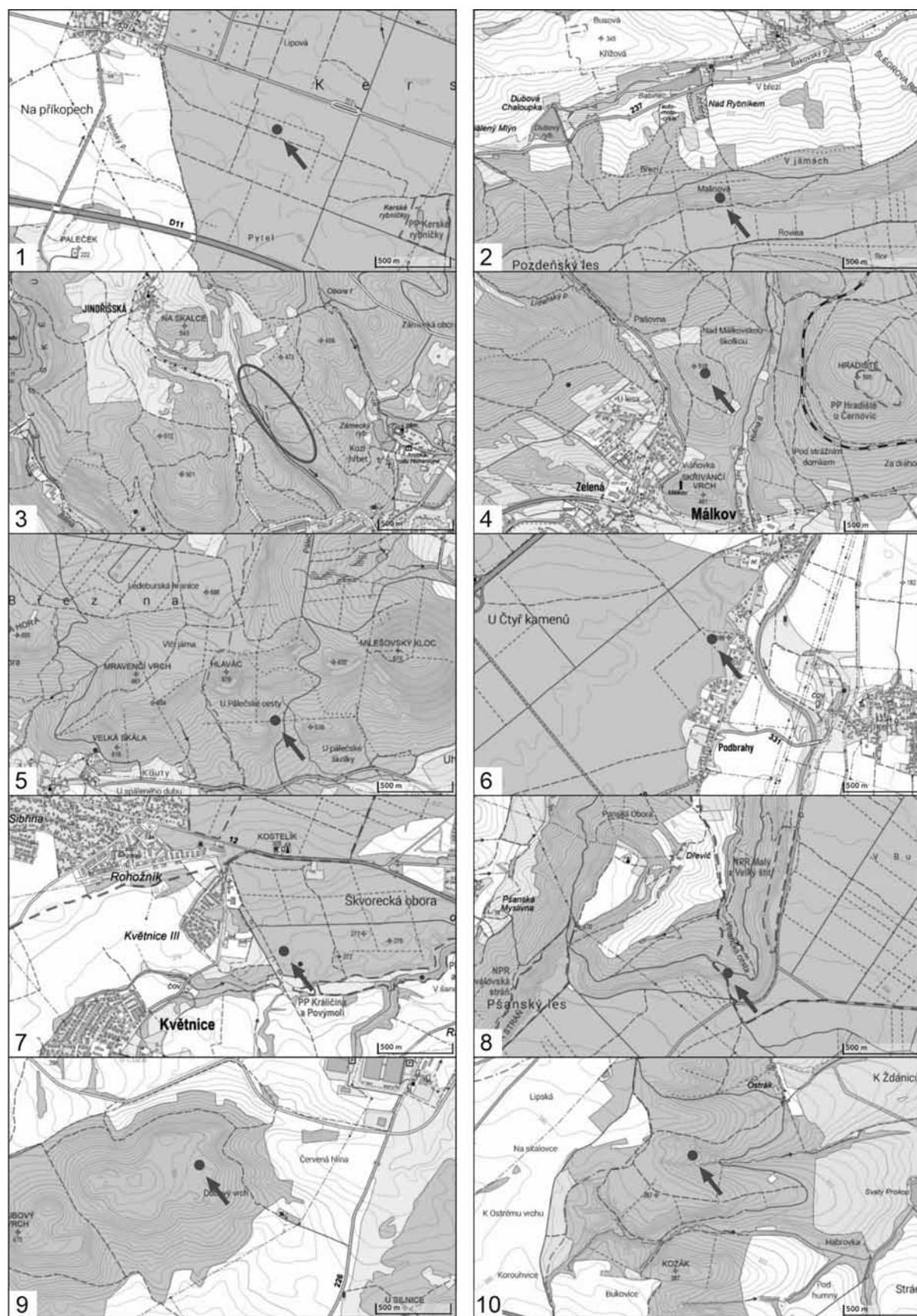


Fig. 3. Location of stray finds of annular fibulae from Bohemia. 1 – Hradištko u Sadské; 2 – Hřešice; 3 – Jirkov-Červený Hrádek; 4 – Málkov u Chomutova; 5 – Pálec u Milešova; 6 – Skorkov; 7 – Úvaly u Prahy; 8 – Vinařice u Loun; 9 – Vroutek; 10 – Ždánice u Koutřimi.

forming section of the National Museum in 1850. Given that this type of artefact has not yet been published from Ukraine, the fibulae from Balicze can be regarded for now as the easternmost example of this type of fastener.

All of the other fibulae presented here (a total of 10 specimens) can therefore be regarded as single finds that had probably been lost away from regular settlement sites. It would be possible to accept this conclusion, since perhaps every archaeologist is aware of the existence of finds that cannot be linked to a grave or settlement context. Many of them could clearly be artefacts that had been lost by their owners as they moved about the land. And yet, it is strange that this context is completely predominant among finds of annular fibulae from Bohemia, be they of Roman-provincial or barbarian origin. R. Koch notes that the majority of finds of these fibulae from Southwestern Germany are single finds (*Koch 1974*, 230). Finds of these fibulae outside of regular settlement or burial sites have also recently increased in Moravia (*Mikulková 2018*, 109, obr. 8: 17). The following is an attempt at a closer contextual analysis of these 10 annular fibulae from Bohemia.

Finds of annular fibulae from Bohemia can be classified in several categories based on the geomorphological position of single finds. The first is composed of finds in the flat landscape currently with forests, including Roman-provincial fibulae from Hradištko u Sadské (Fig. 3: 1) and Úvaly u Prahy (Fig. 3: 7). Today it is impossible to say whether there was some type of special natural situation at these locations in the Late Roman Period. The edges of distinctive terraces can be included in the next category. Skorkov-type fibulae from Hřešice (Fig. 3: 2) and Skorkov (Fig. 3: 6) can be classified in this group. The site at Hřešice is the distinctive southern edge above the valley of the Hřešický and Bakovský streams. The Skorkov findspot is located just a short way from the relatively distinctive edge of the Jizera River terrace. The third category is composed of a narrow valley in hilly terrain (wooded in all cases today) in the immediate vicinity of a small watercourse. Included in this category are finds of a Skorkov-type fibula from Jirkov-Červený Hrádek (Fig. 3: 3) and Roman-provincial fibulae from Pálec u Milešova (Fig. 3: 5) and Ždánice u Kouřimi (Fig. 3: 10). The final category is distinctive highland locations such as hilltops or their edges providing panoramic views. To a certain extent, this category touches on the aforementioned group of finds on prominent terraces and included Skorkov-type fibulae from Málkov u Chomutova (Fig. 3: 4) and Vinařice u Loun (Fig. 3: 8), as well as a large Roman-provincial fibula from Vrutek (Fig. 3: 9). In this context, it should be noted that the aforementioned Jobst 36C/Sellye XVII-type annular fibula found on the slope of Žalý Hill in the cadastral territory of Řevničov (*Vích et al. 2022*) falls well into our fourth category.

Although circumspection is necessary when interpreting similar finds, statistically speaking, we find the significant preponderance of finds of annular fibulae in Bohemia in prominent or otherwise unusual positions striking. The authors of the publication of the find from Řevničov advanced a cautious hypothesis on a “sacred monodeposit”, which we can now substantiate with a larger assemblage of similar finds. While it is not yet clear why Late Roman Period annular fibulae played this special role, it is clear, that the individuals “depositing” these artefacts at their later findspots – whatever their intention may have been – did not distinguish between Roman-provincial and barbarian variants. It is also questionable whether only this particular type of brooches has been treated in this way, or whether it applies to other types as well. This is a hypothesis that remains to be tested. Mass deposits consisting (not only) of brooches, accumulated over a longer period, are already known from Barbaricum, e.g. Pyrmont in Lower Saxony (*Teegen 1998*).<sup>7</sup> In our case, however, we are talking about a one-time event that has not been repeated at the same location. It may correspond to the selective deposition, in which specific types of objects are deposited in only specific places. Theoretically, these objects (monodeposits) are kept apart from other kinds of objects and from specific types of contexts. According to D. R. Fontijn, this must have been in situations in which objects are not merely things, but in which they carry specific and different meanings (*Fontijn 2003*, 216).

#### METAL ANALYSIS AND PRODUCTION-TECHNOLOGICAL CHARACTERISTICS OF FIBULAE

Various surface treatments appeared on the presented artefacts.<sup>8</sup> An elemental analysis established tinning on the fibula from Lipeč (Fig. 4: 1; Table 2). Traces of tinning are also visible in several places on the fibula from Hradištko u Sadské (Fig. 4: 2) and on the fibula from Ždánice u Kouřimi (Fig. 4: 3). Tinning enjoyed

<sup>7</sup> We should mention the huge depot of the Early La Tène period from the “Giant spring” (Riesenquelle) near Duchcov in North-western Bohemia, consisting largely of brooches (*Kruta 1971*).

<sup>8</sup> Images were obtained with a Keyence VHX-S600 microscope (Mechelen, Belgium) with a high depth-of-field.

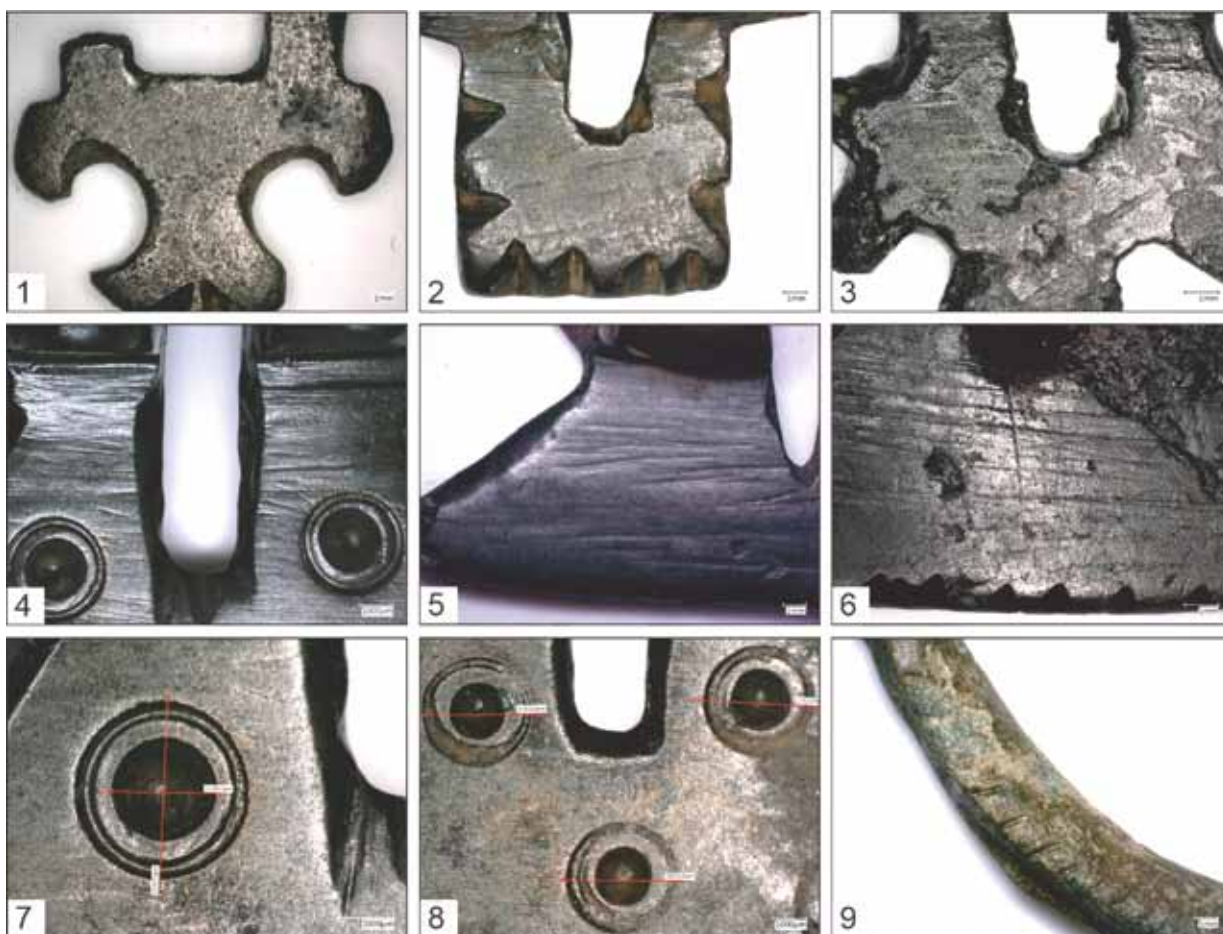


Fig. 4. Surface treatments of annular fibulae from Bohemia. 1–3 – traces of tinning; 4–6 – surface grinding; 7–9 – decorative elements. 1 – Lipec; 2 – Hradištka u Sadské; 3 – Ždánice u Kouřimi; 4 – Hřešice; 5 – Dobřichov; 6 – Málkov u Chomutova; 7 – Hřešice; 8 – Skorkov; 9 – Žehuň. Photos by V. Čistáková.

Table 2. Summary of metal composition of annular fibulae in Bohemia.

| Site                  | Cu    | Zn   | Sn    | Pb    | Fe   | Ag   | Co   | Ni   | Sb   | Bi   | Alloy      |
|-----------------------|-------|------|-------|-------|------|------|------|------|------|------|------------|
| Balicze (UA)          | 59.66 | 0.39 | 5.67  | 34.18 | –    | –    | –    | 0.10 | –    | –    | CuSnPb(Zn) |
| Dobřichov-Piřhóra     | 74.26 | 0.63 | 12.05 | 13.04 | 0.02 | 0.00 | –    | –    | –    | –    | CuSnPb(Zn) |
| Hřešice               | 74.09 | 0.38 | 6.43  | 18.57 | 0.20 | 0.08 | –    | –    | –    | 0.07 | CuSnPb(Zn) |
| Jirkov-Červený Hrádek | 74.69 | 2.69 | 7.36  | 14.96 | 0.15 | 0.02 | –    | –    | –    | –    | CuZnSnPb   |
| Lipec                 | 70.36 | 1.16 | 7.54  | 20.10 | 0.84 | –    | –    | 0.00 | –    | –    | CuZnSnPb   |
| Lipec_surface         | 65.17 | –    | 34.21 | 0.47  | 0.16 | –    | –    | –    | –    | –    | –          |
| Málkov u Chomutova    | 69.63 | –    | 3.73  | 25.89 | 0.04 | –    | –    | –    | –    | 0.05 | CuSnPb     |
| Páleč u Milešova      | 76.33 | 5.79 | 4.45  | 13.11 | 0.21 | 0.04 | –    | 0.06 | –    | –    | CuZnSnPb   |
| Skorkov               | 73.47 | 6.47 | 6.75  | 13.06 | 0.26 | –    | –    | –    | –    | –    | CuZnSnPb   |
| Úvaly u Prahy         | 68.50 | –    | 9.37  | 21.83 | 0.10 | –    | 0.01 | 0.19 | –    | –    | CuSnPb     |
| Vroutek               | 72.21 | 4.21 | 4.62  | 18.45 | 0.38 | –    | –    | –    | 0.08 | –    | CuZnSnPb   |
| Ždánice u Kouřimi     | 72.80 | 1.01 | 5.20  | 19.92 | 0.87 | 0.09 | –    | –    | –    | 0.04 | CuZnSnPb   |
| Žehuň                 | 64.42 | 5.15 | 6.13  | 23.95 | 0.29 | –    | –    | 0.06 | –    | –    | CuZnSnPb   |

considerable popularity in the Roman-provincial environment and is confused with silvering relatively often in the literature (Giumlia-Mair 2005, 362), but of course the opposite is also true, and we quite frequently encounter the tinning of artefacts with a more common function. Tinning often appears on small ornaments like fibulae and on forgings, a treatment that can possibly be connected with rust-proofing and the creation of an attractive silvery appearance. Tinning also appears on bronze vessels, primarily as an anti-corrosion treatment, and on militaria such as helmets and horse harness fittings (Meeks 1986, 135).

When the tin coating was to be applied on only one side of an object, the technology of wipe tinning was employed. This technique involved heating the object to be tinned above the melting point of tin (232 °C), applying a flux (sal ammoniac/ammonium oxide or colophony rosin) and finally the application of the tin in powder or melted form. The melted tin was then wiped over the surface while still hot using a brush or cloth (Benešová 2011, 554; Voß/Hammer/Lutz 1998, 196–198, Abb. 27). The technique of hot dip tinning used in antiquity involved applying a flux to a previously prepared surface<sup>9</sup> and then immersing the object in a bath of molten tin (260 °C). This technique had numerous advantages, as the applied tin layer was thicker and more even. Subsequently, the plating could also be compacted and hardened by polishing (Fütterer et al. 2018, 333). Tin itself (*stannum*) or “false” stannum (two parts brass and one part tin) was used for the plating. Written sources also make reference to alloys called *argentarium* (one part tin and one part lead) and *tertarium* (two parts lead and one part tin; Benešová 2011, 554; Giumlia-Mair 2005, 362). Finally, we can also mention the technique described by Pliny the Elder (*Naturalis Historia* 34, 162, 163) *asincotilia*, a process involving an alloy of copper with a higher share of tin (sometimes even lead), which, through repeated rapid heating to over 520 °C in a reduction atmosphere, could have caused a tin-lead layer to form on the surface (Giumlia-Mair 2005, 366; Meeks 1986, 137; Voß/Hammer/Lutz 1998, 198).

Although barbarian fibulae lack intentional tinning, other surface treatments can be observed, including grinding (Fig. 4: 4–6) followed by polishing. An interesting example of decoration on barbarian fibulae is stamping in the form of concentric circles (Fig. 4: 7, 8). Different decoration in the form of incisions is found on the Roman-provincial fibula from Žehuň (Fig. 4: 9).

A total of 12 fibulae were analysed in order to determine the composition of the alloy.<sup>10</sup> A lead tin brass alloy was identified in seven fibulae (CuZnSnPb). The elemental composition of these artefacts is highly variable. The zinc content is in the range of 1.01–5.79% (see Table. 2), with an average Zn value of 3.78%. This group includes Roman-provincial fibulae (Pálež u Milešova, Lipec, Vroutek and Ždánice u Kouřimi) and those of barbarian provenance (Skorkov, Žehuň and Jirkov-Červený Hrádek). The share of tin is in the range of 4.45–7.54%, with an average value of 6.01%, while the share of lead is in the interval of 13.11–23.95%, with an average value of 17.65%. Three fibulae from Balicze, Dobřichov-Piřchora and Hřeřice are made from a lead tin bronze alloy with a small share of zinc (CuSnPb, Zn?). The amount of zinc was only 0.38–0.68%. The tin content of these fibulae ranges from 5.67 to 12.05%, with an average value of 8.05%, whereas the lead content is in the interval of 13.04–34.18%, with an average value of 21.93%. These quaternary alloys of copper, zinc, tin and lead can be assigned to categories 20–23 according to J. Riederer (1998). Due to the extraordinarily high concentration of lead in the fibula from Balicze (34.18%), it is possible to consider its classification in group 15 (Riederer 1999, 200, tab. 20). Two fibulae (Úvaly u Prahy and Málkov u Chomutova) belong to the lead tin bronze alloy group, in which tin levels range from 3.73 to 9.37%, lead from 21.83 to 25.89%.

The results of the analyses show that a majority of the fibulae were made with tin lead brass (CuZnSnPb) with a low concentration of zinc, a group used heavily for both Roman-provincial products and those of barbarian origin (e.g. Riederer 1999, 200–203, Vích et al. 2020). The artefacts from the tin lead brass group with a low share of zinc are proof of the recycling of brass artefacts and objects made of other copper alloys, which occurred both in the Roman provinces and in Barbaricum (see Čiřřakova/Beneš 2024, 43–49; Voß 2016). A low concentration of zinc can be regarded as proof of recycling, as its share is heavily reduced during

<sup>9</sup> It was first necessary to mechanically grind the object, after which it was soaked in an acidic environment (e.g. vinegar) for degreasing.

<sup>10</sup> Micro-samples of metal material (10–40 mg) were taken from the fibulae by boring with an HSS bit with a TiN finish and a diameter of 1 mm. The points of sample collection were subsequently retouched with coloured modelling wax. Elemental composition analyses were conducted using energy dispersive X-ray fluorescence (ED-XRF) in a Tescan Mira3 LMU electron scanning microscope with a Bruker Quantax 200 energy dispersive analyser. The collected data were analysed using Bruker Esprit software. Conducted by J. Kmošek in the laboratories of the Department of Chemical Technology in the Faculty of Restoration at the University of Pardubice, samples were measured in high vacuum mode, an accelerating voltage of 20 kV, with the detection of backscattered electrons and a data accumulation time of 300 s.

the repeated heating of the brass in oxidising conditions (Vích *et al.* 2020, 176, 177). It is noteworthy that evidence of brass recycling is also observed in the case of artefacts of verifiable Roman-provincial origin. Of course, it is common knowledge that in the 3<sup>rd</sup> century AD there was a slow reduction in the concentration of zinc and brass down to 5–7%, which could be a reflection of economic instability in the Roman Empire, the disruption of supply chains and even the exhaustion of zinc deposits (Droberjar/Frána 2004, 444).

## CONCLUSION

In the text, we have attempted to explore all of the possibilities offered by the assemblage of Roman-provincial and barbarian annular fibulae collected in Bohemia. For the reasons detailed above, the chronology of these artefacts is quite vague and not even the finds published here are of any great help in clarifying this situation. For now, the fibulae can only generally be dated to the broad span between phases C2 and C3. Barbarian specimens can even be found in graves from phase D2. However, based on Skorkov-type fibulae, we were able to document a connection between Bohemia and Central Germany, which appears especially strong in the territory below the Ore Mountains and the Ohře River region (cf. Walther 1998). In contrast, more Roman-provincial specimens appear in the middle Elbe River region. The find contexts of these fibulae (only rarely connected with burial and settlement activities) indicate the highly special function of these artefacts, and it seems as if we are on the trail of some kind of ritual behaviour, with the Roman-provincial or barbarian origin of the fibulae probably not playing a crucial role. Likewise, the composition of the alloy from which the fibulae were made cannot be positively differentiated between Roman-provincial and barbarian, since a similar phenomenon – the recycling of material – was gaining strength in this period in casting workshops on both sides.

## CATALOGUE

### Dobřichov-Pičhora, Kolín distr.

Whole bronze fibula with missing iron tongue. Support plate trapezoidal, undecorated. Body cross-section pentagonal. Height 48 mm, width 40 mm, body cross-section  $4.8 \times 3$  mm, support plate dimensions  $35.25 \times 10$  mm, weight 14.3 g. Allegedly from cremation grave 64 of the Early Roman Period graveyard (Droberjar 1999, 143, 144, 244, Taf. 52; 64: 3; 109: 6). Collection of the National Museum (Prague; inv. no. H1-53782; St. 4323). Fig. 1: 1.

### Hradištko u Sadské, Nymburk distr.

Whole bronze fibula with an iron tongue. Support plate narrow, oblong, ornamented with triangular notches on the edges. Body cross-section rhomboidal. Height 56.5 mm, width 46.5 mm, body cross-section  $5 \times 4$  mm, support plate dimensions  $12 \times 13$  mm, preserved length of tongue 41.5 mm, weight 15.893 g. Stray find in the forest area of Kersko, GPS  $50^{\circ}08'04.4''\text{N}$ ,  $14^{\circ}54'40.8''\text{E}$ , 19. 3. 2022. Collection of the National Museum (Prague; inv. no. not yet assigned). Fig. 1: 2.

### Hřešice, Kladno distr.

Whole bronze fibula with an iron tongue. Support plate trapezoidal, decorated with five engraved concentric circles. Body cross-section triangular. Height 50.5 mm, width 38 mm, body cross-section  $5 \times 3$  mm, support plate dimensions  $28 \times 16$  mm, preserved length of tongue 37 mm, weight 16.0 g. Stray find on forested hilly terrain, GPS  $50^{\circ}13'29.3''\text{N}$ ,  $13^{\circ}55'04.4''\text{E}$ , before 2015. Collection of the National Museum (Prague; inv. no. not yet assigned). Fig. 1: 3.

### Jirkov-Červený Hrádek, Chomutov distr.

Whole bronze fibula with a bronze tongue. Support plate trapezoidal, decorated with three engraved concentric circles. Body cross-section triangular. Height 57.5 mm, width 41 mm, body cross-section  $4.5 \times 3$  mm, support plate dimensions  $24 \times 18$  mm, tongue length 46 mm, weight 14.2 g. Stray find in forested area, according to the finder “by the road between Jirkov and Jindřišská, at the edge of the Červený Hrádek nature reserve”, year 2014. Collection of the Regional Museum in Chomutov (inv. no. CV-N 11770). Fig. 1: 4.

### Lípec, Kolín distr.

Fragment of bronze fibula consisting of part of the round body and support plate with cut-out tendril-like protrusions. D-shaped body cross-section. Tinned surface treatment. Preserved height 32 mm, preserved width 26 mm, body cross-section  $4.5 \times 2.5$  mm, support plate dimensions  $17.5 \times 19$  mm, weight 4.1 g.

Find at settlement site, GPS 50°05'31.0"N, 15°21'21.1"E, year 2014. Collection of the Regional Museum in Kolín (inv. no. not yet assigned). Fig. 1: 5.

**Málkov u Chomutova, Chomutov distr.**

Whole bronze fibula with a bronze tongue. Support plate trapezoidal, decorated with small notches on the lower edge. Body cross-section triangular. Height 53.75 mm, width 40 mm, body cross-section 4.5 × 3 mm, support plate dimensions 21.5 × 2.5 mm, length of the tongue 40 mm, weight 12.192 g.

Stray find on forested hill, GPS 50°27'21.5"N, 13°19'37.8"E, 28. 6. 2021. Collection of the National Museum (Prague; inv. no. not yet assigned). Fig. 1: 6.

**Nebovidy, Kolín distr.**

Nearly intact bronze fibula known only from old photograph only. Support plate rectangular, with three round perforations, edges decorated with notches. Dimensions measured from old photo. Preserved height 69 mm, width 58 mm, support plate dimensions 33 × 26 mm.

Allegedly from cremation grave excavated in 1922 (*Dvořák 1941*, 11). Supposedly in the collection of the Regional Museum in Kolín (not found). Fig. 1: 7.

**Pálec u Milešova, Litoměřice distr.**

Intact bronze fibula with traces of an iron tongue. Support plate ring-shaped, decorated with small lateral protrusions. Body cross-section triangular. The surface is tinned. Height 70 mm, width 49 mm, body cross-section 4 × 4.5 mm, plate dimensions 30 × 19 mm, weight 15.3 g.

Stray find on forested hilly terrain, GPS 50°32'02.7"N, 13°54'17.8"E, 12. 3. 2017. Collection of the Regional Museum in Ústí nad Labem (inv. no. not yet assigned, event number 14-25, bag no. 1). Fig. 1: 8.

**Skorkov, Mladá Boleslav distr.**

Intact bronze fibula with a bronze tongue. Support plate trapezoidal, decorated with five engraved concentric circles and small notches on the lower edge. Body cross-section triangular. Height 50.5 mm, width 38 mm, body cross-section 4.5 × 3 mm, support plate dimensions 28 × 15 mm, tongue length 39 mm, weight 14.6 g.

Stray find in forested area, at a depth of only 10 cm, GPS c. 50°13'31.4"N, 14°44'38.4"E, autumn 2016. Collection of the National Museum (Prague; inv. no. not yet assigned). Fig. 1: 9.

**Úvaly u Prahy, Praha-východ distr.**

Intact bronze fibula with remainder of an iron tongue. Support plate small, trapezoidal, decorated with a horizontal relief rib. Body cross-section rhomboidal. Height 52 mm, width 44 mm, body cross-section 4.5 × 5 mm, support plate dimensions 16 × 14 mm, weight 16.1 g.

Stray find in forested area, only 25 cm deep, GPS 50°4'0.118"N, 14°41'41.646"E, 5. 12. 2017. Held in the private collection of the finder. Fig. 1: 10.

**Vinařice u Loun, Louny distr.**

Intact bronze fibula with a bronze tongue. Support plate trapezoidal, undecorated. Body cross-section unknown, probably triangular. Dimensions unknown.

Stray find on forested hilly terrain, at a depth of only 7 cm, GPS 50°14'34.5"N, 13°50'13.1"E, 26. 12. 2015. Held in the private collection of the finder, never provided to an archaeologist for study. Fig. 5.

**Vroutek, Louny distr.**

Intact bronze fibula with an iron tongue. Support plate wide, with tendril-like protrusions, decorated with notches on the lower edge. D-shaped body cross-section. Height 82 mm, width 62 mm, body cross-section 8 × 3.5 mm, support plate dimensions 45.5 × 20 mm, preserved tongue length 59 mm, weight 46.78 g.

Stray find on forested hill, at a depth of only 25 cm, GPS c. 50°12'17.3"N, 13°22'30.9"E, probably in 2015. Collection of the Regional Museum in Louny (inv. no. A 11601). Fig. 1: 11.

**Ždánice u Kouřimi, Kolín distr.**

Intact bronze fibula with the remainder of an iron tongue. Support plate is cut-out with tendril-like protrusions. Body cross-section pentagonal. Height 56.5 mm, width 46 mm, body cross-section 5.5 × 4 mm, support plate dimensions 14 × 15.5 mm, preserved tongue length 17 mm, weight 15.098 g.

Stray find in forested area, at a depth of only 22 cm, GPS 49°58'52.32"N, 14°56'31.88"E, 25. 4. 2021. Collection of the Regional Museum in Kolín (inv. no. not yet assigned). Fig. 1: 12.



Fig. 5. The annular fibula from Vinařice u Loun, Louny distr. Photo sent by the finder.

**Žehuň, Kolín distr.**

Nearly intact bronze fibula with missing iron tongue. Support plate trapezoidal, with bent lower edge, perforated by expanded slit. The ring-shaped body is decorated with pointed protrusions on the outer side. Obverse edge is decorated with fine oblique incising. Body cross-section pentagonal. Height 68 mm, width 52 mm, body cross-section 4.5–5.5 × 4 mm, support plate dimensions 27 × 15 mm, weight 18.3 g.

Find at settlement site, GPS only approximately 50°08'39.2"N, 15°18'06.9"E, year 2010–2011. Collection of the National Museum (Prague; inv. no. not yet assigned). Fig. 1: 13.

**Balicze, today Podorozhnje, Lviv Oblast (Ukraine)**

Intact bronze fibula without marks of a tongue. Support plate trapezoidal, with bent lower edge, decorated with five engraved concentric circles. Body cross-section pentagonal. Height 61 mm, width 39.5 mm, body cross-section 4.5–5 × 4 mm, support plate dimensions 29.5 × 20 mm.

Without archaeological context. Gift of the Court Council of Leopold Johann Nepomuk Knight von Sacher. Collection of the National Museum (Prague; old collection, inv. no. H1-64962). Fig. 1: 14.

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## Kruhové spony z pozdní době římské z Čech

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### Zhrnutí

Kruhové spony představují poměrně širokou skupinu spon, které se ve střední Evropě objevují již od doby železné a její varianty se vyvíjejí až do raného středověku. V tomto příspěvku se autoři zabývají jejich specifickou skupinou, která se objevuje v pozdní době římské a v době stěhování národů. Jde o kruhové spony s opěrnou destičkou na spodní straně, které ve střední Evropě shledáváme jak na území římských provincií – především Panonie – tak i na území tzv. barbarika. Provinciální exempláře se vyznačují rozmanitě prolamovanou a vykrajovanou destičkou, přičemž oblastí jejich nejčastějšího výskytu je Panonie, kde předpokládáme výrobní dílny. Lze je do jisté míry typologizovat pomocí práce I. Sellye (1990). Barbarské spony jsou pak opatřeny destičkou trapézovitěho tvaru a obvykle jsou zdobeny rytými soustřednými kroužky. Oblast jejich výskytu se rozprostírá od Rýna na západě, Severního moře na severu a Dunaje na jihu. Východní hranice není za současného stavu výzkumu známa. Rozlišujeme zde několik variant, mezi nimiž je varianta Böckingen neobvyklejší. Datace těchto spon je obvykle hledána od konce 3. století po celé 4. století a dost možná ještě do poloviny 5. století.

Z 15 evidovaných kruhových spon s opěrnou destičkou z Čech je 8 typologicky římsko-provinciálního původu a mnohé z nich mají přímé analogie ve středodunajských provinciích, především Panonii. V Čechách se s nimi setkáváme především ve středočeském Polabí, méně často v Poohří. Barbarské varianty jsou zachyceny v 7 kusech, přičemž pouze nález z pohřebiště Dobřichov-Píchora je možné řadit mezi varianty Böckingen. Všechny ostatní mají poněkud užší opěrnou destičku a jelikož mají odpovídající analogie ve středním Německu a Pomohani, usuzujeme z toho, že jde o regionální polabskou variantu odlišující se od porýnských a severoněmeckých exemplářů. Byla tak pro ně vytvořena varianta Skorkov. V Čechách dominují v severozápadočeském regionu.

Kontext, ve kterém byly české exempláře nalezeny, bohužel nepomáhá řešit otázku jejich chronologického ukotvení. Pouze dva kusy pocházejí z hrobů (Dobřichov, Nebovidy), v obou případech jde však o nálezy sporné či nedokumentované. Dvě spony (Lípec, Žehuň) pocházejí z ornice na sídlištních lokalitách. Spona z ukrajinské lokality Balicze je starým nálezem, předaným do Národního muzea ještě v 19. století. Zbytek českých kruhových spon představují ojedinělé nálezy. Pokud se však pokusíme shrnout geomorfologii míst jejich nálezů, vyvstanou před námi čtyři situace:

1. nálezy v ploché krajině, v současné době zalesněné (Hradičko u Sadské, Úvaly u Prahy);
2. nálezy na hranách výrazných teras (Hřešice, Skorkov);
3. nálezy v úzkých údolích v kopcovité krajině, poblíž drobné vodoteče (Jirkov-Červený Hrádek, Pálec u Milešova, Ždánice u Kouřimi);
4. nálezy na výrazných výšinných polohách (Málkov u Chomutova, Vinařice u Loun, Vroutek).

Statisticky viděno je značná převaha nálezů kruhových spon v Čechách ve výrazných či jinak neobvyklých polohách zarážející a můžeme tak podpořit hypotézu o tzv. sakrálních monodepozitech. Na rozdíl od hromadných depotů, v nichž spony hrály velkou roli (např. Pyramont), mohlo jít v tomto případě o jednorázovou událost s dosud nejednoznačným vysvětlením.

Pomocí mikroskopu a ED-XRF byla na několika provinciálních sponách (Lípec, Hradičko u Sadské, Ždánice u Kouřimi) zjištěna úprava povrchu pocínováním. Barbarské varianty tuto úpravu postrádají. Dvanáct spon bylo podrobeno ED-XRF analýze prvkového složení slitin. Většina spon byla vyrobena z cíno-olovnaté mosazi (CuZnSnPb) s nízkou koncentrací zinku. Zmíněná skupina byla hojně užívaná jak pro římsko-provinciální výrobky, tak i pro předměty barbarské provenience, a je dokladem recyklace mosazných předmětů a předmětů z jiných slitin mědi, ke kterým docházelo jak na území římských provincií, tak i na území barbarika.

Obr. 1. Kruhové spony z Čech a Ukrajiny. 1 – Dobřichov; 2 – Hradičko u Sadské; 3 – Hřešice; 4 – Jirkov-Červený Hrádek; 5 – Lípec; 6 – Málkov u Chomutova; 7 – Nebovidy; 8 – Pálec u Milešova; 9 – Skorkov; 10 – Úvaly u Prahy; 11 – Vroutek; 12 – Ždánice u Kouřimi; 13 – Žehuň; 14 – Balicze. Kresby Z. Beneš.

Obr. 2. Kruhové spony z Čech. Trojúhelník – římsko-provinciální spony; soustředné kroužky – barbarské spony typu Böckingen; body – barbarské spony typu Skorkov. 1 – Dobřichov; 2 – Hradičko u Sadské; 3 – Hřešice; 4 – Jirkov-Červený Hrádek; 5 – Lípec; 6 – Málkov u Chomutova; 7 – Nebovidy; 8 – Pálec u Milešova; 9 – Skorkov; 10 – Úvaly u Prahy; 11 – Vinařice u Loun; 12 – Vroutek; 13 – Ždánice u Kouřimi; 14 – Žehuň.

Obr. 3. Poloha nálezů tzv. ojedinělých nálezů kruhových spon z Čech. 1 – Hradičko u Sadské; 2 – Hřešice; 3 – Jirkov-Červený Hrádek; 4 – Málkov u Chomutova; 5 – Pálec u Milešova; 6 – Skorkov; 7 – Úvaly u Prahy; 8 – Vinařice u Loun; 9 – Vroutek; 10 – Ždánice u Kouřimi.

Obr. 4. Povrchová úprava kruhových spon z Čech. 1–3 – stopy cínování; 4–6 – stopy pilování; 7–9 – výzdobné motivy. 1 – Lipec; 2 – Hradištko u Sadské; 3 – Ždánice u Kouřimi; 4 – Hřešice; 5 – Dobřichov; 6 – Málkov u Chomutova; 7 – Hřešice; 8 – Skorkov; 9 – Žehuň. Foto V. Čistáková.

Obr. 5. Kruhová spona z Vinařic u Loun, okr. Louny. Zasláno nálezcem.

Tabela 1. Souhrn typologického určení kruhových spon z Čech.

Tabela 2. Souhrn prvkového složení kruhových spon z Čech.

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