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Andrzej Maciałowicz

A FIND OF A BRONZE ALMGREN 65 BROOCH FROM NORTHERN POLAND AS EVIDENCE OF THE EARLIEST INFLUX OF ROMAN IMPORTS

Abstract: A chance find from the right-bank lower Vistula zone—a bronze brooch of the Oberschan type, belonging to the Almgren 65 form—provides an opportunity to reassess the interpretation prevailing in Polish scholarship, according to which specimens of this form have been regarded as Celtic imports. The analyses carried out, including lead-isotope investigation of the alloy, indicate that the piece in question is a product of north Italic workshops of the Late Republican period.

Keywords: Late Pre-Roman Period, Late La Tène Period, Oksywie Culture, brooches, lead-isotope analysis, Roman imports, Amber Route

Introduction

The first substantial influx of Roman imports—primarily brooches, but also bronze vessels and, less frequently, weaponry—from the eastern Alpine zone and the *Caput Adriae* reached present-day Poland only towards the end of the Late Pre-Roman Period.[1] This occurred in phase A_3 and especially in subphase A_3/B_1, the latter already representing the very initial segment of the Early Roman Period. In chronological terms, this concerns essentially the second half of the first century BC, and in particular the decades around the turn of the eras.

In this context, the number of Roman craft products that can be reliably assigned to an earlier horizon is very small. These include items dated to phase A_2 and possibly subphase A_2/A_3, that is, to the period between roughly the second half of the second century and the mid-first century BC. The literature has primarily highlighted certain bronze vessels, especially various types of *situlae*.[2]

Far less attention has been devoted to other categories of Roman imports that might plausibly be placed this early (phases A_2–A_2/A_3). Chief among these are the few bronze fibulae of north Italic provenance known so far. Four finds are most often cited: a Carceri-type brooch from the

[1] Wielowiejski 1991; Dąbrowska 2003; Maciałowicz 2010; Harasim 2013; Woźniak 2020; Grygiel, Kędzierski 2023, fig. 11.

[2] See the literature in n. 1 and: Dąbrowska 1996; Jakubczyk 2024. The case of Republican coins, mainly *denarii*, is set aside here, as determining the precise date of their influx is a matter of debate. The few known contexts can likewise be dated no earlier than around the mid-first century BC, see: Bodzek *et alii* 2016, pp. 155–163; Dymowski, Rudnicki 2019, p. 54; Grygiel, Kędzierski 2023, p. 16; with further reading.

Oksywie Culture cemetery at Chełmno in the Chełmno Land, on the lower Vistula, Grave 177; a Cenisola-type specimen from Feature 90/47 at the settlement of the Tyniec Group in Zofipole near Kraków in western Lesser Poland; and two so-called spoon-bow/conchoidal brooches (German: *Schüsselfibeln*) of the Mailhac type from the same cultural grouping, from Podłęże and Czechy.[3] The occurrence of Cenisola- and Mailhac-type brooches at eastern Celtic oppida[4] suggests that these early Italic imports reached the northern side of the Carpathians via this zone of the La Tène Culture, most likely through exchange networks associated with the so-called 'Amber Route'.[5]

Against this background, the chance discovery of a fragment of a richly decorated bronze brooch belonging to form Almgren 65 (hereinafter: A 65)[6] from the right-bank lower Vistula zone in northern Poland is of particular significance [Fig. 1]. It provides a strong reason to broaden the corpus of the earliest Roman Republican products identified north of the Carpathians by including at least some specimens from the steadily growing group of bronze brooches of this form, which

Fig. 1. Bronze brooch found in northern Poland, east of the lower Vistula
(photo by A. Maciałowicz)

have hitherto—together with their iron counterparts—been treated mainly as Celtic imports.[7]

Description of the Find

The brooch under discussion forms part of a collection of several hundred archaeological objects handed over to the Museum of Warmia and Masuria in Olsztyn by the public prosecutor's office in 2008.[8] The artefacts had been obtained through illegal metal-detecting by an amateur detectorist. Most indications suggest that they were acquired in the wider Iława area in northern Poland, east of the lower Vistula; indeed, some pieces are known to have come from a Wielbark Culture cemetery uncovered by the finder near the village of Rodzone, Iława County, on the Drwęca River.[9]

[3] Dulęba 2009, p. 22, fig. 6 and Maciałowicz 2015, pp. 282–283, 285, fig. 8:2, 3, 8, with references; Dulęba, Wysocki 2016, p. 305, fig. 3:2; cf. Meller 2012, pp. 36–37, 44–46, 83, maps 4, 10, 26.

[4] E.g., Pieta 2010, fig. 16:12–14, 20

[5] Maciałowicz 2015, pp. 287–288, fig. 9; Dulęba, Wysocki 2016, p. 318, fig. 12

[6] Almgren 1923, p. 35, pl. IV:65, 66.

[7] Cf. Bokiniec 2008, p. 243; Harasim 2013, pp. 7–8; Bochnak 2014, pp. 41–44.

[8] Deposit no. D-1435 OMO.

[9] Cieśliński 2010, p. 277, pl. 73/A:1–8; Krasowska 2011.

The precise provenance of the brooch A 65, however, remains uncertain, and there is no firm basis for assuming that it originated from that same cemetery. According to the information the finder later provided (pers. comm.), his activities occasionally covered a broad area extending from the rivers Drwęca and Pasłęka towards the lower Vistula. Thus, the Chełmno Land must also be considered, given the intensive settlement of the Oksywie Culture from the Late Pre-Roman Period documented there. Still, it also seems possible that the brooch was found somewhere in the Iława Lake District, the area he explored most frequently.[10]

The object in question is a fragment of a robust copper-alloy brooch, lacking its catchplate as well as the spring and pin [Fig. 1]. It comprises a markedly thickened head with a rounded, almost oval outline and a flat underside bordered by a single narrow groove. From the underside of the head projects a short remnant of the bronze wire from which the spring had originally been formed. The head tapers towards the apex of the bow, which carries three circumferential crests ('rings'), the central one being the most prominent. Immediately behind it is a small tripartite lappet-like protrusion set upright as an ornamental feature. Along both sides of the bow runs a longitudinal groove, either cut after casting or cast and subsequently accentuated by filing (with visible traces of cutting). This feature was clearly intended to evoke a Middle La Tène construction, even though the brooch itself is unquestionably of Late La Tène type, with the foot cast integrally with the bow to form a enclosed, frame-like catchplate. Dimensions: surviving length 6.25 cm; base of the head diameter ca. 0.8 × 1.2 cm.

The brooch can confidently be assigned to form A 65—usually somewhat inaccurately referred to as a particular 'type A 65'—a morphologically diverse category for which several more detailed classification schemes have been proposed.[11] Such features as the tripartite lappet-like protrusion, the longitudinal grooves imitating a Middle La Tène construction and giving this part of the bow an '8-shaped' cross-section, and the rounded outline of the thickened head's base allow a more precise attribution within the typological frameworks proposed by various scholars. In the system introduced by Maurizio Buora, Aldo Candussio, and Stefan Demetz on the basis of finds from Friuli in northern Italy, the brooch corresponds to variant A.[12] In the more detailed scheme later developed independently by Demetz for finds from the circum-Alpine zone, it matches variant A 65b1a.[13] The brooch also fits the Oberschan type in Harald Meller's most recent classification.[14] Although all three varieties mentioned are comparable,[15] the scheme proposed by the last of the scholars cited—based on a broad corpus of finds from various regions across Europe—will be used in the analysis that follows.

Oberschan-Type Brooches of Form A 65

All specimens of the Oberschan type are made of copper alloys. The substantial thickness and strong profiling of the bows of these generally large brooches indicate casting. Finishing details were then worked with files and other tools, as demonstrated by the find from northern Poland.

[10] In any case, acquisition of this piece through the trade in archaeological artefacts can be excluded, as its incomplete condition would have made it an unattractive commodity. This, in turn, suggests that the brooch was recovered within the area in which the finder was actively operating.

[11] For the history of the definition and internal classification of A 65 brooches, see: Demetz 1999, pp. 27–28; Meller 2012, pp. 53–54.

[12] Buora, Candussio, Demetz 1992, pp. 66–68, pl. I.

[13] Demetz 1999, p. 29, pl. 2. Within this scheme, the absence of a transverse decorative bar in the catchplate is also diagnostically significant, a point that can be established despite the fragmentary preservation of this part of the brooch under discussion.

[14] Meller 2012, pp. 59–60, figs. 33–35.

[15] Variant A 65b1a as defined by Demetz is a broader class, as it includes not only the Oberschan type but also other types distinguished by Meller.

The specimen under discussion finds excellent counterparts among north Italic examples of the Oberschan type [Fig. 2:1–4],[16] a variety particularly characteristic of Cisalpine Gaul and the southern Alpine zone. A marked concentration is observed in the region of Trentino-Alto Adige/Südtirol [Fig. 3].[17] Across the Alps, these brooches are far less common—the Celtic oppidum at Manching (Bavaria)[18] is one of the most prominent findspots with two specimens [Fig. 2:5]—while occurrences north of the Danube are genuinely exceptional. Only three or four specimens from the oppidum at Stradonice in central Bohemia can be cited [Fig. 2:6–8],[19] together with a find from a region east of the lower Vistula discussed in this article. The distinct concentration of finds in the

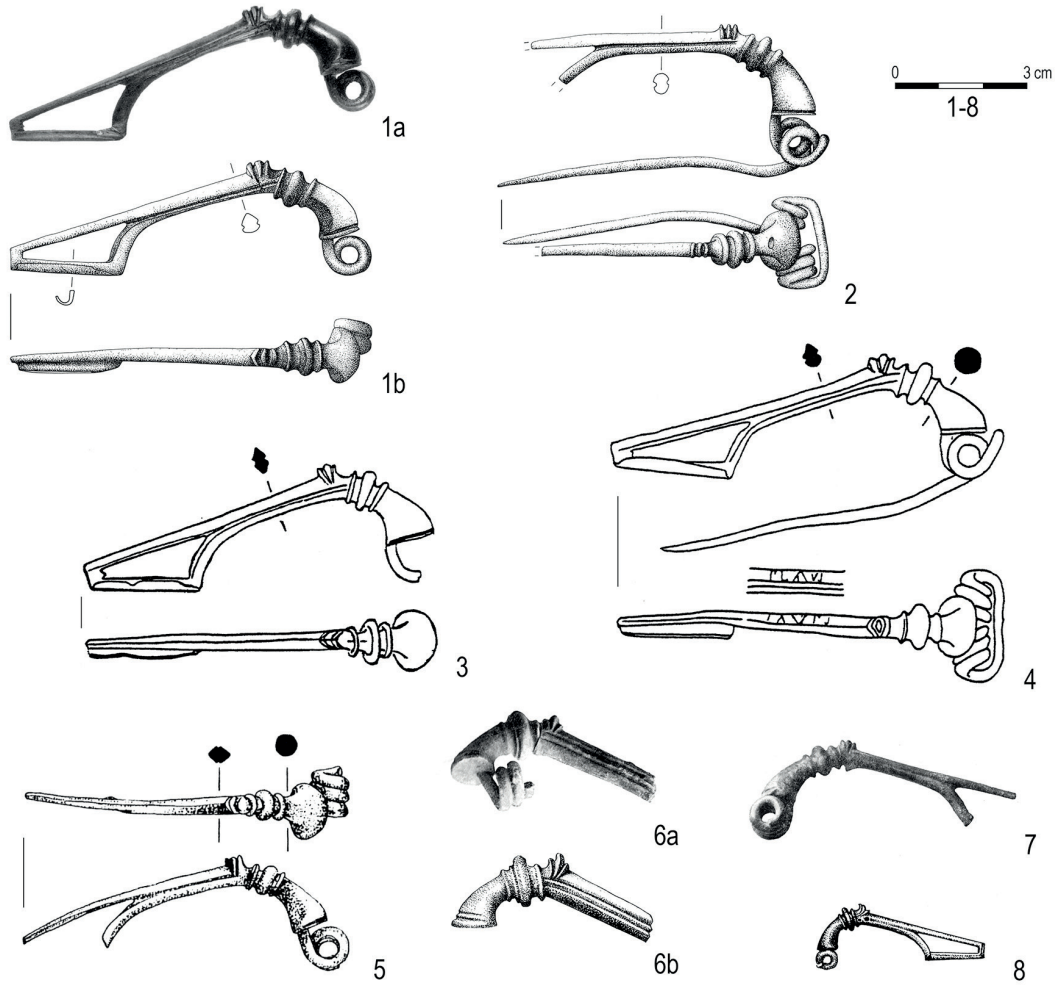

Fig. 2. Bronze Almgren 65 brooches of the Oberschan type. 1a, 1b, 2 – Este-Baratella, IT; 3 – Sanzeno, IT; 4 – Nonsberg, IT; 5 – Manching, DE; 6–8 – Stradonice, CZ (1a, 1b, 2: after Meller 2002; 3, 4: after Demetz 1999; 5: after Gebhard 1991; 6a, 7: after Pič 1903; 6b, 8: after Břeň 1964)

[16] Buora, Candussio, Demetz 1992, pl. I; Demetz 1999, pl. 2; Meller 2002, pls. 32:373, 374, 83:373; Meller 2012, figs. 33:12, 34:1, 3, 12–15, 35:7, 10–16.

[17] Meller 2012, map 15.

[18] Gebhard 1991, pl. 10:185, 188.

[19] The uncertainty regarding the number of Oberschan-type specimens found at this site stems from the very limited information in the publications. Further difficulties arise from inconsistencies between some of the brooch descriptions in Jiří Břeň's catalogue and the figures published by that author. See: Pič 1903, p. 34, pl. IV:14, 15?, 27; Břeň 1964, p. 243, nos. 537–539, 542?, pl. 15:537, 538; cf. Meller 2012, p. 59, no. 23 (102).

Po River basin suggests that brooches of the Oberschan type were produced there, and represent a local expression within the highly non-homogeneous form A 65. Accordingly, the few finds north of the Alps should be regarded as imports from northern Italy.

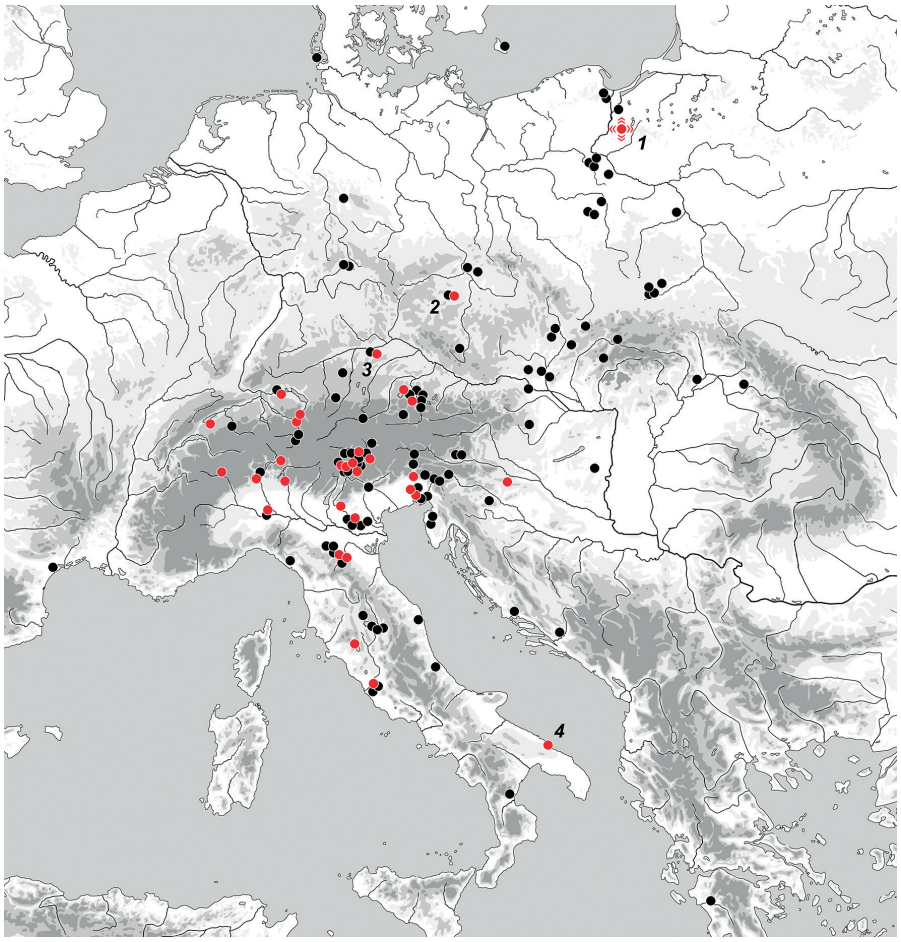

Fig. 3. Distribution of bronze A 65 brooches: the Oberschan type (red dots) and other types recorded in present-day Poland (black dots). Findspots mentioned in the text: 1 – northern Poland, east of the lower Vistula; 2 – Stradonice; 3 – Manching; 4 – ancient Egnatia (after Meller 2012 and Maciałowicz 2015, with supplements; graphics by A. Maciałowicz)

Dating

Dating of the Oberschan type, as well as of copper-alloy[20] A 65 brooches more generally, is complicated by differences in how individual scholars define the later stages of the La Tène period.[21] In the scheme originally developed for the Rhineland, A 65 brooches are regarded as chronological

[20] Iron counterparts of bronze A 65 brooches form a somewhat distinct group, characterised by a different distribution pattern and possibly a separate origin, and therefore require independent analysis; see: Maciałowicz 2015, pp. 282–286, fig. 9.

[21] Cf. Gebhard 1991, p. 94, fig. 42; Buora, Candussio, Demetz 1992, pp. 72–75, fig. 2; Božič 2008, p. 49; Sedlmayer 2009, pp. 178 ff.; Meller 2012, pp. 70–71; Piana Agostinetti *et alii* 2014, pp. 43–44, fig. 12; Kysela 2020, p. 54.

indicators of the LT D2a phase, a dating generally shared by Italian scholars. In contrast, in the classic 'south German' framework of La Tène relative chronology—developed in part on the basis of finds from Manching—A 65 brooches are assigned to LT D1b.[22] The latter scheme is better grounded in Central European archaeology and is therefore adopted in the present article.[23] In both frameworks, brooches of form A 65—at least the 'classic' varieties, including the Oberschan type—follow the Nauheim type and belong to the same horizon as the highly varied group of spoon-bow brooches.

Oberschan-type specimens are unfortunately known mainly from settlement contexts or as stray finds. Grave 14 at Cama (canton Graubünden, CH), where a large specimen of this type co-occurred with two spoon-bow brooches of even greater size, made of sheet bronze, represents a rare exception.[24] On account of the presence of the latter, Demetz proposed a very late dating for this assemblage, placing it in the Augustan period (after 30 BC), despite explicitly acknowledging the lack of solid comparative grounds for such a chronology.[25] This assemblage subsequently became one of the pillars of his view that large A 65 brooches, especially with strongly profiled decoration, assigned by him to variant A 65b1 (thus including the Oberschan type) continued in use for an extended period.[26] The pair of spoon-bow brooches from Grave 14 at Cama finds numerous close parallels at the cemetery of Giubiasco (canton Ticino/Tessin, CH), where—in the few undisturbed assemblages—they are accompanied primarily by artefacts that can be securely assigned to the LT D1 phase, including its later subphase (D1b).[27] Studies by other authors likewise indicate that bronze spoon-bow brooches (of various variants) appeared in Cisalpine Gaul no later than the LT D1b phase (LT D2a in the 'Rhineland' system).[28] Finds from the oppida of Stradonice and, above all, Manching also indicate that Oberschan-type specimens, including large ones, were present in Central Europe no later than this phase.[29]

The absolute chronology of the brooches under discussion poses even greater difficulties. As Oberschan-type specimens do not provide independent dating evidence, their chronology must be inferred from the general dating of A 65 forms and, where applicable, from other artefacts representing the LT D1b (LT D2a) phase. The main chronological anchors are Roman coins and other Mediterranean wares occurring in graves from Cisalpine Gaul and the southern Alpine zone. Demetz placed the occurrence of various A 65 brooches within a broad time span of ca. 80–20 BC.[30] On the basis of coins from the Ornavasso (Piedmont) grave assemblages, Stefanie Martin-Kilcher dated her horizon 2b—encompassing most brooches relatively close to

[22] One of the few precisely dated grave assemblages containing 'classic' A 65 types comes from Berjač (SLO). In the richly furnished Grave 1, two fragmentarily preserved brooches—probably of the Kojetín type, variant 1, and the Aquileia type according to Meller—were accompanied, i.a., by two local brooches, as well as fragments of a brooch related to the Nauheim II type (after Demetz 1999). This association allows the assemblage to be dated to phase LT D1b. See Fabec *et alii* 2024, pp. 17–22 and 34–46 with figs.

[23] The clearest discrepancy concerns chronologies based on the 'Rhineland' system, in which spoon-bow brooches are contemporary with Almgren 18 fibulae (LT D2a), whereas in Central Europe the latter undoubtedly represent a later horizon. For a substantive critique of this system, see Brandt 2001, pp. 60–66; Kysela 2020, pp. 51–55.

[24] Ettlinger 1973, p. 49, pl. 23:4; Demetz 1999, p. 220, list 1.2 and p. 238, list 1.3.4; Meller 2012, figs. 35:15, 60:4, 6.

[25] Demetz 1999, p. 72.

[26] Demetz further cited two grave assemblages from the cemetery at Idrija pri Bači (SLO), including one—Grave 5—of problematic homogeneity, as well as the chronology of finds from Magdalensberg in Carinthia, which is discussed below. See Demetz 1999, pp. 35–37 with references.

[27] Cf. graves 380, 420, and 424 in Pernet *et alii* 2006, pp. 317, 322, 323 and unnumbered plates.

[28] Piana Agostinetti *et alii* 2014, pp. 41–43.

[29] For the dating of the decline of Central European oppida, see Kysela 2020, pp. 61–65, figs. 9 and 10.

[30] Demetz 1999, pp. 34–37, figs. 6, 9–11.

the 'classic' A 65 types—to ca. 90/80–70/60 BC.[31] Paola Piana Agostinetti with collaborators, analysing material from across Cisalpine Gaul and drawing likewise on numismatic evidence, proposed a similarly narrow dating for LT D2a (represented, i.a., by A 65 brooches)—thus following the 'Rhineland' chronology— namely ca. 90/80–60 BC.[32] The appearance of other forms typical of this phase—most notably copper-alloy spoon-bow brooches and a stylistically early specimen of the so-called knotted fibula (German: *Knotenfibel*)[33]—possibly already in the 80s BC is suggested by four silver Roman *quinarii* found in the richly furnished grave from Treviglio (via XXIV Maggio) in Lombardy.[34] These coins show virtually no wear, and the latest specimen was issued in 87–86 BC. A distinctly later timeframe, between ca. 70/60 and 50/40 BC, was suggested by Helga Sedlmayer, based also on evidence from Magdalensberg in Carinthia.[35] The three A 65 brooches—representing the 'classic' Aquileia and, presumably, Kojetín (variant 2) types[36]—derive from secondary deposits or constitute stray finds from the same settlement zones as other brooches dated by her to 'LT D1–D2a' (according to the 'Rhineland' chronology). This distribution pattern suggests that these artefacts document the earliest occupation of the settlement, preceding the Late Caesarian and early Augustan phases, which at the earliest began around 50/40 BC.[37] The alloys used to manufacture A 65 brooches, including the Oberschan type, likewise suggest that the peak popularity of these forms fell before the 50s BC (see below).

Thus, the finds from Cisalpine Gaul and the southern Alpine zone point to a timeframe for the use of brooches typical of the LT D1b (LT D2a) phase, including form A 65, broadly spanning the 80s to the 40s BC.

In chronological frameworks for Central Europe based on the 'south German' system, the LT D1b phase—with A 65 brooches as one of its markers—is generally placed within the first half of the first century BC. Jan Kysela has recently proposed a date of ca. 80/70–50 BC.[38] By contrast, Dragan Božič, drawing, i.a., on coin datings from the Treviglio grave and from phase 2b at Ornavasso, as well as on the chronology of the Roman camp at Cáceres el Viejo (Extremadura, ES), which yielded a Nova vas-type brooch dated to LT D1b, places this phase distinctly earlier, at ca. 100–70 BC.[39] Both ranges, however, broadly correspond to the datings of the A 65 brooch horizon derived from southern Alpine and Po Valley material.[40]

In the territory of present-day Poland, three grave assemblages containing bronze A 65 brooches are known that may serve as a basis for the dating of this form within the chronology of the Late Pre-Roman Period. Importantly, all three are graves of the Oksywie Culture and thus belong to the cultural group with which the Oberschan-type brooch discussed here should most plausibly be associated. In Grave 'c' at Skowarcz (formerly Schönwarling), near Gdańsk, a pair of A 65 brooches of the Kojetín type, variant 2, was accompanied by a fragment of a relatively large iron brooch (preserved length ca. 7 cm) of Middle La Tène construction, classified as type C according to Józef Kostrzewski.[41] This association allows the assemblage to be dated to phase A_2,

[31] Martin-Kilcher 1998, pp. 235, 241, 249, figs. 29, 31 and fig. "SB 15" on p. 200; cf. Demetz 1999, p. 35.

[32] Piana Agnostinetti *et alii* 2014, 58–60, fig. 12.

[33] In fact, it represents the Auerberg type of the group 2 of A 65 forms as defined by Meller 2012, pp. 63–64, figs. 40, 41.

[34] De Marinis, Rapi 2020. Cf. Demetz 1999, p. 35, n. 95, who questions such an early dating of this assemblage, referring to the specific dynamics of coin deposition in graves at Ornavasso (at the time, however, the knotted fibula from the Treviglio grave—then unpublished—was misidentified as A 65).

[35] Sedlmayer 2009, pp. 116–122.

[36] Sedlmayer 2009, p. 28, pl. 13:287–289. For the typology, see Meller 2012, pp. 54–56.

[37] A much earlier dating of the first phase of Magdalensberg—to the first three decades of the first century BC—was proposed by Božič 2008, pp. 123–129.

[38] Kysela 2020, pp. 52–65.

[39] Božič 2008, especially p. 87.

[40] A peculiarly late dating of the LT D1b phase, to ca. 50–35 BC, was proposed by Meller 2012, pp. 24–30; however, this view remains isolated.

[41] Kostrzewski, *Archive*, folder 13, card no. 455; Kostrzewski 1919, pp. 18–19, fig. 3 and pp. 40–41, 364: no. 86, fig. 26.

possibly even to its earlier part. In Grave 481 from nearby Pruszcz Gdański, Site 10, a fragmentary and deformed brooch, probably also representing the Kojetín type, variant 2, was accompanied by a partially preserved small iron brooch close to type A. This suggests that the assemblage should likewise be placed within phase A_2, or at the latest within the A_2/A_3 subphase.[42] The third find derives from the well-known cemetery at Malbork-Wielbark (former Willenberg), located likewise south of the Gulf of Gdańsk but on the right bank of the lower Vistula, approximately 30 km from Skowarcz. In grave 2010/16, a bimetallic A 65 brooch—bronze with an iron spring, most probably of the Aquileia type—was discovered, accompanied, i.a., by a small iron brooch of type A.[43] This assemblage likewise permits the burial to be dated to phase A_2, or at the latest within the A_2/A_3 subphase.

In summary, the grave finds from the Oksywie Culture, although few, allow bronze A 65 brooches to be placed within phase A_2 of the Late Pre-Roman Period, roughly corresponding to phase LT D1. Indirectly, therefore, the stray find of the Oberschan-type brooch from the right-bank lower Vistula zone may also be placed within this chronological horizon.

Chemical Analyses

The artefact under discussion was subjected to chemical analyses at the Biological and Chemical Research Center, University of Warsaw, in order to determine the elemental composition of the alloy from which it was made and to assess the possible provenance of the metal.[44] The sample was taken from the rear of the brooch head. As only a few relevant chemical analyses have been published, the present study refers primarily to material from the Celtic oppida at Třísov in southern Bohemia, which has been the subject of several comprehensive studies,[45] and from Manching in Bavaria.[46]

Table 1. Elemental composition of the sample from the Oberschan-type A 65 brooch found in northern Poland (normalised to 100 wt%)

As	Au	Bi	Co	Cu	Ni	Pb	Pd	Sb	Sn	Zn
0.117	0.001	0.007	0.017	76.982	0.049	19.200	0.004	0.050	3.570	0.002

The bow was cast from a leaded bronze with only a minor tin content [Table 1].[47] The addition of lead lowers the melting temperature and increases the fluidity of the metal, which would have been advantageous for a brooch characterised by pronounced profiling and fine plastic decorative details. The limited compositional data available indicate a substantial proportion of lead in the alloys used to cast the bows of robust bronze brooches of Italic or south-eastern Alpine provenance.[48] Where such data are lacking, the presence of a greyish patina on some specimens may

[42] Pietrzak 1997, p. 68 pl. CXLI/481:1, 2 (both brooches incorrectly identified as type M and illustrated schematically); cf. Harasim 2013, p. 35, fig. 3:1 (the iron brooch misidentified as type K) and the collection of the Archaeological Museum in Gdańsk.

[43] Łuczkiewicz, Kuzioła 2019, pp. 530–531, fig. 6.

[44] The analyses were carried out by Dr hab. Jakub Karasiński.

[45] Danielisová *et alii* 2017; Danielisová, Strnad, Mihaljevič 2018.

[46] Riederer 2003.

[47] All results for the total elemental composition were obtained using ICP-MS (NexION 350D, PerkinElmer). Owing to methodological limitations, the weight percentage of copper was not measured directly but calculated as the difference between the measured concentrations of the remaining elements, so that the total equalled 100%.

[48] E.g., Demetz 1999, p. 94; Mödlinger, Drnić, Picardo 2012.

serve as a supplementary, indirect indicator of leaded alloys.[49] Nevertheless, the exceptionally high lead content (19.2%) of the brooch discussed here is striking.

The comparative material from Manching and especially Třísov comprised Mötschwil (LT C2) and Nauheim (LT D1a) brooches, characteristic of the La Tène culture, as well as A 65 brooches presumed to be of Italic provenance, together with fragments of bronze vessels and mirrors, likewise regarded as Mediterranean wares.[50] Among the analysed A 65 forms, the Aquileia type predominated, but a Kojetín type, variant 2, was also present, as well as an Oberschan-type specimen from Manching.[51]

On the Cu–Sn–Pb ratio plot [Fig. 4], the analysed artefacts form several clearly distinct clusters. One consists of mirrors made of tin-rich bronze. Two others include Nauheim and Mötschwil brooches, likewise produced in tin bronzes, virtually lead-free or with only negligible lead contents, respectively. A further distinct cluster is formed by A 65 brooches characterised by elevated lead levels. The brooch from northern Poland stands apart, displaying among the highest lead and markedly lower tin ratios.[52] Bronze vessels, typically preserved as solid feet or handle elements, constitute a separate, widely dispersed group whose distribution overlaps with all categories except the mirrors. The contrast in alloys between the heavily leaded bronze of the A 65 specimens and the tin-rich bronzes—likewise suitable for casting—of the Mötschwil and Nauheim brooches suggests different production centres, characterised either by access to different raw materials or by differing selection preferences.

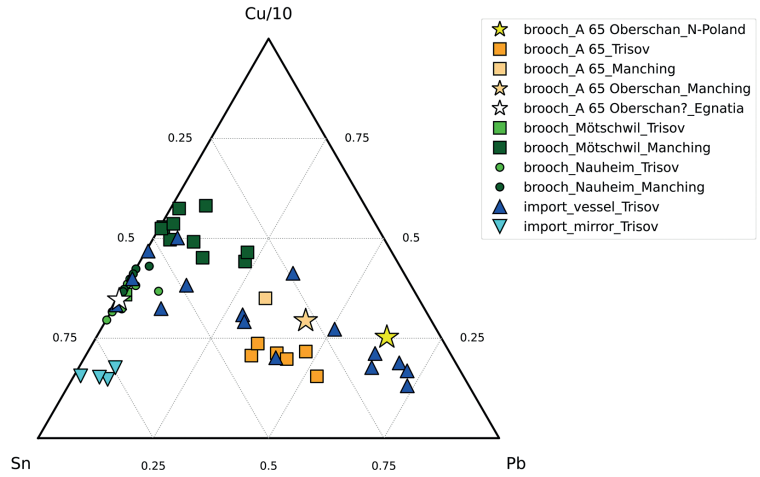

Fig. 4. Cu–Sn–Pb ratios of the Almgren 65 Oberschan-type brooch from northern Poland compared with selected artefact categories from the oppida at Třísov and Manching, as well as from ancient Egnatia. Cu concentrations divided by 10 (database after Riederer 2003; Danielisová, Strnad, Mihaljevič 2018; Gianossa *et alii* 2013; graphics by A. Maciałowicz)

[49] Demetz 1999, pp. 94–95, n. 537; Božič 2008, pp. 74–77; Meller 2012, pp. 36–37. This may also be the case for the aforementioned A 65 brooches from Skowarcz, now lost, which were described as being made of 'white metal'; see Kostrzewski 1919, p. 41.

[50] Danielisová, Militký 2014; Kysela, Danielisová, Militký 2014; cf. Kysela 2020, pp. 144–149 on mirrors.

[51] Danielisová, Militký 2014, fig. 2b:20–22, 24–26; Gebhard 1991, pl. 10:188.

[52] There are artefacts at oppida displaying a similar Cu–Sn–Pb ratio; however, specimens with comparably low tin levels are characterised by a significant antimony component, essentially absent in the find from northern Poland, see Danielisová *et alii* 2020, table 2; cf. Schwab 2014, pp. 177–179.

In this context, the analysis results of thirteen A 65 brooches from Slovenia, including at least one Oberschan-type specimen, are also noteworthy. Although detailed analytical data have not been published, it has been established that twelve were made of leaded bronze, while only a single example—belonging to a late type showing affinities with Almgren 238 fibulae—was produced in brass.[53] The latter alloy is thought to have appeared in brooch production in Roman workshops only during the Gallic War. This likewise constitutes indirect evidence for an early dating—before the 50s BC—for the peak use of the cast bronze A 65 brooches, contrary to the view advanced by Demetz.[54] A high lead content (6–8%) was also recorded in the bows of a pair of Aquileia-type A 65 brooches discovered at the foot of the Steinsburg oppidum on Kleiner Gleichberg in Thuringia; in this case, too, no full chemical analyses of the alloys have been published.[55]

The analyses discussed so far concern exclusively A 65 specimens found outside Italy. The only Italic find for which such analyses have been published is a brooch, probably of the Oberschan type, from ancient Egnatia in Apulia. Its alloy contained virtually no lead and more than 15% tin, a result striking in light of the data discussed above.[56] This primarily places it close to the Mötschwil brooch cluster, overlapping with a few Mediterranean bronze vessel fragments [Fig. 4]. This finding must nevertheless be treated with caution, given the object's severe corrosion (including so-called bronze disease) and its provenance far to the south of the presumed production centres in northern Italy, leaving it unclear whether the brooch represents an import or a local imitation.

Table 2. Lead isotope ratios in the sample from the Oberschan-type A 65 brooch found in northern Poland

$^{208}Pb/^{204}Pb$	$^{207}Pb/^{204}Pb$	$^{206}Pb/^{204}Pb$	$^{208}Pb/^{206}Pb$	$^{207}Pb/^{206}Pb$
38.9190	15.6868	18.7506	2.07498	0.83639

The provenance studies were based on an analysis of lead isotope ratios in the alloy from which the brooch under discussion was cast [Table 2].[57] However, owing to the high lead content of the alloy, Pb isotopic analyses primarily reflect the source of the intentionally added lead rather than that of the copper, as the latter isotopic signal is effectively masked.[58] Nevertheless, a comparison of the obtained results with those of artefacts from the oppidum at Třísov—representing the groups mentioned above—yields noteworthy observations. In this case, however, two of the analysed A 65 brooches were made of silver. One of these represented the Le Catillon type, unknown in Italy, while the other one—of the Partenen type—appears in the Po, as well as in the upper Rhine and Danube river basins.[59] The remaining four bronze examples belong to the Aquileia and Kojetín (variant 2) types.[60]

Despite a certain degree of homogeneity in the results, as previously emphasised by the authors of the analyses of the Třísov artefacts,[61] some variability emerges at higher resolution, with the brooch from northern Poland seeming to confirm certain tendencies in this respect [Fig. 5].

[53] Istenič, Šmit 2007, pp. 141, 144–154, fig. 1; Istenič 2009, especially pp. 240–241 and the caption to fig. 2.
[54] Istenič 2009, pp. 240–242; cf. Demetz, p. 37.
[55] Cf. Mödlinger, Drnić, Picardo 2012, p. 1347 with references.
[56] Gianossa *et alii* 2013, pp. 1240, 1245–1246, fig. 1:9, table 5.
[57] Lead isotope ratios were measured using MC-ICP-MS with internal standard calibration (NIST Tl SRM 997), and corrected on the basis of the international lead isotope standard NIST SRM Pb 981. The reported isotope ratio is the mean of four measurements. Data precision (MC-ICP-MS) is better than 0.01% for ratios with ^{206}Pb in the denominator and better than 0.03% with ^{204}Pb in the denominator.
[58] Cf. Danielisová *et alii* 2020, p. 10.
[59] Cf. Meller 2012, pp. 60, 63, maps 16 and 17.
[60] Danielisová, Militký 2014, pp. 49–50, fig. 2b:19, 22, 24–26, 27 and fig. 3.
[61] Danielisová *et alii* 2017, p. 92; Danielisová, Strnad, Mihaljevič 2018, p. 12.

Above all, on plots comparing the proportions of individual lead isotopes—especially $^{206}Pb/^{204}Pb$ versus $^{207}Pb/^{206}Pb$ [Fig. 5:b]—the artefact under discussion forms a distinct cluster together with most other A 65 specimens and with bronze vessel and mirror fragments regarded as Mediterranean imports. One of the silver A 65 brooches, of the Le Catillon type, lies slightly apart [Fig. 5:a, b]. Brooches of local production, of the Nauheim and Mötschwil types, show a much more dispersed pattern and generally occur at a clear distance from this cluster.

Notably, the $^{208}Pb/^{206}Pb$ versus $^{207}Pb/^{206}Pb$ isotopic signatures of clustered metal vessels, mirrors, and A 65 brooches (except for the Le Catillon type) closely match the range defined by the galena (lead ore) deposits in ancient Carthago Nova, south-eastern Spain [Fig. 5:a], a range which, as demonstrated by Roland Schwab, also encompasses Republican lead ingots, as well as metal

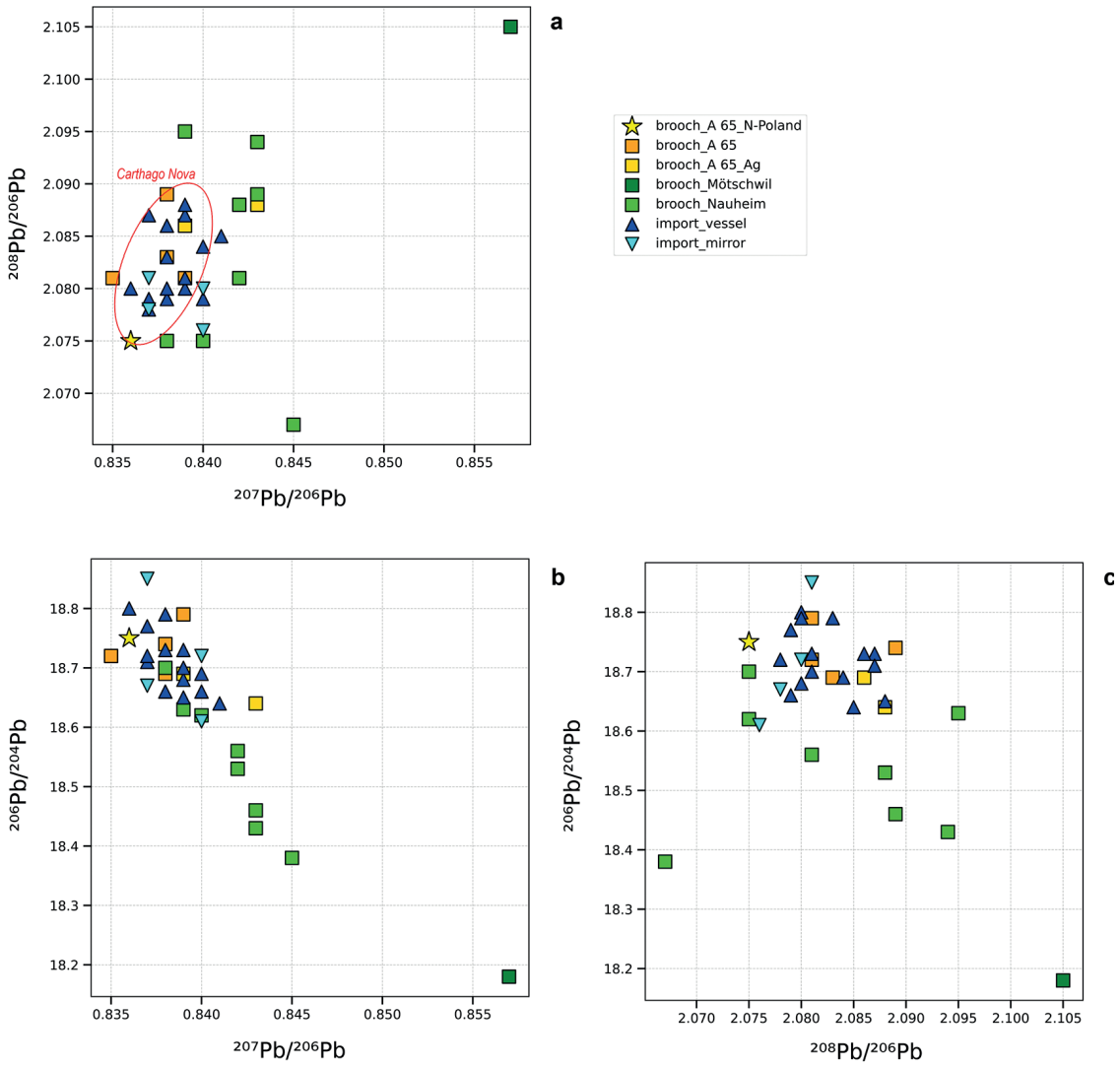

Fig. 5. Lead isotopic ratios of the Almgren 65 Oberschan-type brooch from northern Poland compared with selected artefact categories from the oppidum at Třísov, and with a simplified outline of the isotopic signature of galena deposits in ancient Carthago Nova (database after Schwab 2014 and Danielisová, Strnad, Mihaljevič 2018; graphics by A. Maciałowicz)

vessels from the oppidum at Manching.[62] This close correspondence in lead isotope ratios between artefacts typologically identified as having a southern provenance and the material referenced by Schwab is unlikely to be coincidental. Although the small sample of Central European finds analysed so far, including A 65 brooches, precludes firm conclusions, the observed match nevertheless supports the interpretation that the artefacts within this cluster were produced from raw materials imported from that part of Spain, which by this time had already been a Roman province for more than a century. If this material—whether in the form of scrap metal, ingots, or finished wares—reached the transalpine Celtic oppida zone, it is assumed to have done so via northern Italy,[63] the region generally regarded as the area of origin for most of the A 65 brooch forms discussed here.

Conclusions

Traditional distribution analysis of the Oberschan type in Europe indicates that these brooches should be regarded as products of northern Italic workshops, with the few specimens occurring north of the Alps representing imports from that region. This interpretation is supported by analytical studies of elemental composition and lead isotope provenance. In both respects, A 65 brooches—including Oberschan specimens—from oppida, as well as the one from northern Poland, show close affinities with material regarded as Mediterranean imports (mirror and vessel fragments), whereas forms of clearly local La Tène provenance tend to display differing patterns, both in elemental composition and in lead isotope ratios. Moreover, the isotopic signatures of the brooch from northern Poland and of the finds from the oppidum at Třísov closely correspond to those of galena deposits in Roman south-eastern Spain.

It may therefore be assumed that the Oberschan-type brooch found east of the lower Vistula, together with other A 65 varieties—above all the Aquileia type—are imports from Cisalpine Gaul.[64] Although local imitation of bronze A 65 brooches at Celtic oppida has been postulated,[65] types known from northern Italy usually occur there only in relatively small numbers. While local production of derivatives of 'classic' A 65 types, such as the Le Catillon type, is entirely plausible, many examples with close parallels in the Po River basin are best interpreted as evidence for intensive exchange with the south, much like the increasingly frequent fragments of bronze vessels imported across the Alps that are now being recorded at oppida through modern metal-detector surveys. A similar distribution pattern [Fig. 3], observed for both Oberschan-type brooches and other bronze A 65 brooch types known from present-day Poland—above all Aquileia and Kojetín (variant 2)—lends support to the hypothesis that these are predominantly products of northern Italic provenance.

Overall, the convergent chronology of the brooches discussed here—across Cisalpine Gaul, the Central European oppida, and areas north of the Carpathians—indicates that the influx of this category of imports took place in the first half of the first century BC. The inhabitants of the oppida zone most likely played an active role in organising this long-distance exchange, maintaining intensive contacts with the Mediterranean while—according to archaeological evidence, including material from Poland— also establishing durable links with communities of the North European Plain. Given the distribution pattern of A 65 brooches, extending from the Baltic coast

[62] Schwab 2014, pp. 182–184, fig. 13; cf. similar conclusions by Danielisová *et alii* 2017, pp. 93–96, fig. 11 and Danielisová *et alii* 2021, pp. 283, fig. 10, based on different lead isotope ratios.

[63] Danielisová *et alii* 2017, pp. 93–96; Danielisová, Strnad, Mihaljevič 2018, p. 16 with references.

[64] Cf. Demetz 1999, p. 38; Meller 2012, pp. 66–67 and 68–69.

[65] Meller 2012, p. 69; Danielisová *et alii* 2017, p. 94. For a presumed semi-product from Stradonice, see Pič 1903, pl. IV:10.

to the *Caput Adriae*, Baltic amber appears to have been the principal commodity involved. This, in turn, raises the question of whether the origins of the so-called Amber Route—understood as a network linking the Roman world with northern European Barbaricum—should be dated half a century earlier than hitherto assumed.

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Abbreviation

Kostrzewski, *Archive*	scholarly archive of Józef Kostrzewski, held at the Wojewódzka i Miejska Biblioteka Publiczna im. Cypriana Norwida, Zielona Góra, Poland.

Bibliography

Almgren 1923	O. Almgren, *Studien über Nordeuropäische Fibelformen der ersten nachchristlichen Jahrhunderts mit Berücksichtigung der provinzial-römischen und südrussischen Formen* (= *Mannus-Bibliothek* 32), Leipzig.
Bochnak 2014	T. Bochnak, *Importy celtyckie w kulturze przeworskiej i oksywskiej na ziemiach polskich w młodszym okresie przedrzymskim. Zróżnicowanie – drogi napływu – kontekst kulturowy* [Celtic Imports in the Przeworsk and Oksywie Cultures in the Polish Lands during the Late Pre-Roman Period. Diversity, Routes of Influx, and Cultural Context], Rzeszów.
Bodzek *et alii* 2016	J. Bodzek, J. Bulas, M. Grygiel, J. Pikulski, "Roman republican coins found at Zagórzyce, Kazimierza Wielka district, Świętokrzyskie Province", *Recherches Archéologiques. Nouvelle Serie* 8, pp. 143–172.
Bokiniec 2008	E. Bokiniec, *Kultura oksywska na ziemi chełmińskiej w świetle materiałów sepulkralnych* [The Oksywie Culture in the Chełmno Land in the Light of Sepulchral Evidence], Toruń.
Božič 2008	D. Božič, *Late La Tène-Roman Cemetery in Novo mesto. Ljubljanska cesta and Okrajno glavarstvo. Studies on Fibulae and on the Relative Chronology of the Late La Tène Period / Poznolatensko-rimsko grobišče v Novem mestu. Ljubljanska cesta in Okrajno glavarstvo. Študije o fibulah in o relativni kronologiji pozne latenske dobe* (= *Katalogi in monografije* 39), Ljubljana.
Brandt 2001	J. Brandt, *Jastorf und Latène. Kultureller Austausch und seine Auswirkungen auf soziopolitische Entwicklungen in der vorrömischen Eisenzeit* (= *Internationale Archäologie* 66), Rahden/Westf.
Břeň 1964	J. Břeň, "Význam spon pro datování keltských oppid v Čechách" [The significance of brooches for dating Celtic oppida in Bohemia], *Sborník Národního Muzea v Praze. Řada A – Historie* XVIII/5, pp. 195–289.
Buora, Candussio, Demetz 1992	A. Buora, A. Candussio, S. Demetz, "Fibule 'ad arpa', o del tipo Almgren 65, in Friuli", *Quaderni Friulani di Archeologia* II, pp. 65–83.

Cieśliński 2010 — A. Cieśliński, *Kulturelle Veränderungen und Besiedlungsabläufe im Gebiet der Wielbark-Kultur an Łyna, Pasłęka und oberer Drwęca* (= *Berliner Beiträge zur Vor- und Frühgeschichte. Neue Folge* 17), Berlin.

Danielisová, Militký 2014 — A. Danielisová, J. Militký, "Pozdně laténské spony z oppida Třísov, získané povrchovou prospekcí v letech 2008–2013" [Late La Tène brooches from the Třísov oppidum, acquired through surface prospection in years 2008–2013], *Archeologické rozhledy* LXVI, pp. 40–66.

Danielisová, Strnad, Mihaljevič 2018 — A. Danielisová, L. Strnad, M. Mihaljevič, "Circulation patterns of copper-based alloys in the Late Iron Age *oppidum* of Třísov in Central Europe", *Metalla* 24.1, pp. 5–18 (https://metalla.org/index.php/METALLA/article/view/11051, accessed on 29.06.2025).

Danielisová *et alii* 2017 — A. Danielisová, J. Kysela, M. Mihaljevič, J. Militký, Metal working at the oppidum of Třísov, South Bohemia—a review, [in:] Stories That Made the Iron Age. Studies in Honour of Natalie Venclová, eds. J. Kysela, A. Danielisová, J. Militký, Praha, pp. 83–99.

Danielisová *et alii* 2020 — A. Danielisová, D. Bursák, L. Strnad, J. Trubač, H. Čižmářová, D. Daněček, K. Smíšek, "Rituals, hoards and travellers? Archaeometry of the Iron Age bronze wheel amulets", *Interdisciplinaria Archaeologica. Natural Sciences in Archaeology* 11/1, pp. 33–45.

Danielisová *et alii* 2021 — A. Danielisová, D. Bursák, L. Strnad, J. Trubač, M. Fikrle, "Life cycles of metals in the Iron Age (4th–1st century BC). Sourcing and recycling of copper based allloys", [in:] *Proceedings of the 5th International Conference „Archaeometallurgy in Europe" 19–21 June 2019, Miskolc, Hungary* (= *Monographies Instrumentum* 73), eds. B. Török, A. Giumlia-Mair, Drémil-Lafage, pp. 273–288.

Dąbrowska 1996 — T. Dąbrowska, "Frühe Stufen der Przeworsk-Kultur. Bemerkungen zu den Kontakten mit Südeuropa", [in:] *Kontakte längs der Bernsteinstraße (zwischen Caput Adriae und den Ostseegebieten) in der Zeit um Christi Geburt. Materialien des Symposium – Kraków 26.–29. April 1995*, ed. Z. Woźniak, Kraków, pp. 127–142.

Dąbrowska 2003 — T. Dąbrowska, "Jeszcze raz o najwcześniejszych wpływach rzymskich na ziemiach polskich" [Revisiting the earliest Roman influences in the Polish lands], [in:] *Antyk i Barbarzyńcy. Księga dedykowana profesorowi Jerzemu Kolendo w siedemdziesiątą rocznice urodzin*, eds. A. Bursche, R. Ciołek, Warszawa, pp. 153–159.

Demetz 1999 — S. Demetz, *Fibeln der Spätlatène- und frühen römischen Kaiserzeit in den Alpenländern* (= *Frühgeschichtliche und provinzialrömische Archäologie* 4), Rahden/Westf.

Dulęba 2009 — P. Dulęba, "Przemiany kulturowe w zachodniej Małopolsce w okresie od III do I wieku przed Chr. Przyczynek do kontaktów między Celtami a Germanami" [Cultural transformations in western Lesser Poland from the third to the first century BC: A contribution to the study of contacts between Celts and Germans], [in:] *Archeologia Barbarzyńców 2008: powiązania i kontakty w świecie barbarzyńskim. Materiały z IV Protohistorycznej Konferencji Sanok, 13–17 października 2008* (= *Collectio Archaeologica Ressoviensis* XIII), eds. M. Karwowski, E. Droberjar, Rzeszów, pp. 11–35.

Dulęba, Wysocki 2016 — P. Dulęba, P. Wysocki, "New data regarding the question of interregional contacts in the Iron Age. Results of a surface survey in Czechy, Kraków district", *Sprawozdania Archeologiczne* 68, pp. 301–325.

Dymowski, Rudnicki 2019 — A. Dymowski, M. Rudnicki, "The Nowa Wieś Głubczycka hoard and the influx of Roman republican denarii north of the Carpathians", [in:] *Auf den Spuren der Barbaren – archäologisch, historisch, numismatisch*

(Archäologie der Barbaren 2015), (= *Spisy Archeologického Ústavu AV ČR Brno* 60), eds. M. Karwowski, B. Komoróczy, P. Trebsche, Brno, pp. 51–64.

Ettlinger 1973 — E. Ettlinger 1973, *Die römischen Fibeln in der Schweiz*, Bern.

Fabec *et alii* 2024 — T. Fabec, B. Laharnar, M. Mlinar, T. Nanut, D. Božič, *Na dvorišču železnodobnih prednikov. Arheološko najdišče Berjač pri Podbeli* [On the Courtyard of Iron Age Forebears. The Berjač Archaeological Site near Podbela], Ljubljana.

Gebhard 1991 — R. Gebhard, *Die Fibeln aus dem Oppidum von Manching* (= *Die Ausgrabungen in Manching* 14), Stuttgart.

Gianossa *et alii* 2013 — L. C. Giannossa, S. Loperfido, M. Caggese, G. E. De Benedetto, R. Laviano, L. Sabbatini, A. Mangone, "A systematic characterization of *fibulae* from Italy: from chemical composition to microstructure and corrosion processes", *New Journal of Chemistry* 37, pp. 1238–1251.

Grygiel, Kędzierski 2023 — M. Grygiel, A. Kędzierski, "A gold coin from Jastrzębniki, Kalisz district (PL). On the late Celtic coinage in north-central Europe", *Praehistorische Zeitschrift* 98(2), pp. 729–749.

Harasim 2013 — P. Harasim, "Studia nad lateńskimi oraz prowincjonalnorzymskimi importami w kulturze oksywskiej" [Studies in La Tène and provincial Roman imports in Oksywie culture], *Wiadomości Archeologiczne* LXIV, pp. 3–48.

Istenič 2009 — J. Istenič, "Roman military equipment and the beginnings of the Roman use of brass in Europe", [in:] *WAFFEN IN AKTION. Akten der 16. Internationalen Roman Military Equipment Conference (ROMEC), Xanten, 13.–16. Juni 2007* (= *Xantener Berichte, Grabung – Forschung – Präsentation* 16), eds. A. W. Busch, H.-J. Schalles, Mainz am Rhein, pp. 237–242.

Istenič, Šmit 2007 — J. Istenič, Ž. Šmit, "The beginning of the use of brass in Europe with particular reference to the southeastern Alpine region", [in:], *Metal and Mines. Studies in Archaeometallurgy*, eds. S. La Niece, D. Hook, P. T. Craddock, London, pp. 140–147.

Jakubczyk 2024 — I. Jakubczyk, "Situle Eggers 18 w Barbaricum" [Situlae Eggers type 18 in Barbaricum], *Wiadomości Archeologiczne* LXXV, pp. 127–151.

Kostrzewski 1919 — J. Kostrzewski, *Die ostgermanische Kultur der Spätlatènezeit* (= *Mannus-Bibliothek* 18–19), Leipzig – Würzburg.

Krasowska 2011 — K. Krasowska, *Kolekcja iławska i cmentarzysko kultury wielbarskiej w Rodzonem, pow. iławski* [The Iława Collection and the Cemetery of the Wielbark Culture at Rodzone, Iława County], Warszawa (unpublished MA thesis in the Faculty of Archaeology, University of Warsaw).

Kysela 2020 — J. Kysela, *Things and Thoughts. Central Europe and the Mediterranean in the 4th–1st Centuries BC* (= *Studia Hercynia. Monographs* 1), Praha.

Kysela, Danielisová, Militký 2014 — J. Kysela, A. Danielisová, J. Militký, "Středomořské importy z oppida Třísov. Nálezy z povrchové prospekce s detektory kovů z let 2007–2013" [Mediterranean imports at the Třísov oppidum. Finds from surface surveys with metal detectors, conducted in 2007–2013], *Archeologické rozhledy* LXVI, pp. 567–608.

Łuczkiewicz, Kuzioła 2019 — P. Łuczkiewicz, A. Kuzioła, "Malbork-Wielbark (woj. pomorskie/PL) und die Keltiké: Neues von einer fast vergessenen Nekropole", *Archäologisches Korrespondenzblatt* 49/4, pp. 527–542.

Maciałowicz 2010 — A. Maciałowicz, "Interesujący zespół grobowy z nowych badań na cmentarzysku kultury przeworskiej w Gołębiewie, pow. Nidzica (d. Taubendorf, Kr. Neidenburg)" [An interesting grave assemblage from new investigations at the Przeworsk culture cemetery in Gołębiewo, Nidzica County (formerly Taubendorf, Kr. Neidenburg)], [in:]

TERRA BARBARICA. Studia ofiarowane Magdalenie Mączyńskiej w 65. rocznicę urodzin (= *Monumenta Archaeologica Barbarica. Series Gemina* II), eds. A. Urbaniak *et alii*, Łódź – Warszawa, pp. 368–386.

Maciałowicz 2015 — A. Maciałowicz, "Handwerk, Handel und Heirat? Neues über Kontakte der Boier mit den Germanen anhand von Fibelfunden", [in:] *Boier zwischen Realität und Fiktion. Akten des internationalen Kolloquiums in Český Krumlov vom 14.–16.11.2013* (= *Kolloquien zur Vor- und Frühgeschichte* 21), eds. M. Karwowski, V. Salač, S. Sievers, Bonn, pp. 273–293.

de Marinis, Rapi 2020 — R. C. de Marinis, M. Rapi, "A Late La Tène grave from Treviglio (Bergamo)", *Studi Etruschi (Serie III)* LXXXII (2019), pp. 111–142.

Martin-Kilcher 1998 — S. Martin-Kilcher, "Gräber der späten Republik und der frühen Kaiserzeit am Lago Maggiore: Tradition und Romanisierung", [in:] *Bestatungssitte und kulturelle Identität. Grabanlagen und Grabbeigaben der frühen römischen Kaiserzeit in Italien und den Nordwest-Provinzen Kolloquium in Xanten vom 16. bis 18. Februar 1995: "Römische Gräber des 1. Jhs. n. Chr. in Italien und den Nordwestprovinzen"* (= *Xantener Berichte. Grabung – forschung – Präsentation* 7), eds. P. Fasold, Th. Fischer, H. von Fiesberg, M. Witteyer, Köln, pp. 191–252.

Meller 2002 — H. Meller, *Die Fibeln aus dem Reitia-Heiligtum von Este (Ausgrabungen 1880–1916). Studien zu den Spätlatèneformen* / *Le fibule dal santuario di Reitia a Este (scavi 1880–1916). Studio delle forme del tardo La Tène* (= *Studien zu vor- und frühgeschichtlichen Heiligtümern* 2: *Il santuario di Reitia a Este* 1, 1), Mainz am Rhein.

Meller 2012 — H. Meller, *Die Fibeln aus dem Reitia-Heiligtum von Este (Ausgrabungen 1880–1916), Studien zu den Spätlatèneformen* / *Le fibule del santuario di Reitia a Este (scavi 1880–1916). Studi sulle forme del tardo-lateniane* (= *Studien zu vor- und frühgeschichtlichen Heiligtümern* 2, 2: *Il santuario di Reitia a Este* 1, 2), Mainz am Rhein.

Mödlinger, Drnić, Picardo 2012 — M. Mödlinger, I. Drnić, P. Picardo, "Alloying elements as chronotechnological marker for second and first century BC fibulae from ancient Pannonia", *JOM: The Journal of The Minerals, Metals & Materials Society* 64/11, pp. 1343–1349 (https://link.springer.com/article/10.1007/s11837-012-0415-0, accessed on 29.06.2025)

Pernet *et alii* 2006 — L. Pernet, E. Carlevaro, L. Tori, G. Vietti, Ph. Della Casa, B. Schmid-Sikimić, *La necropoli di Giubiasco (TI), vol. II: Les tombes de La Tène finale et d'époque romaine* (= *Collectio Archæologica* 4), Zürich.

Piana Agnostinetti *et alii* 2014 — P. Piana Agnostinetti with collaboration of V. Blandino, V. Esposito, E. Giannini, J. Kaurin, R. Knobloch, C. Montalvo Puente, C. Tavolini, „La cronologia della tarda età di La Tène e dell'età augustea nella Transpadana centro-occidentale", [in:] *Les Celtes et le Nord de l'Italie Premier et Second Âges du fer* / *I Celti e l'Italia del Nord Prima e Seconda Età del ferro. Actes du XXXVI^e colloque international de l'AFEAF. Vérone, 17–20 mai 2012* / *Verona, 17–20 maggio 2012* (= *Supplément à la R.A.E.* 36), eds. Ph. Barral, J.-P. Guillaumet, M.-J. Roulière-Lambert, M. Saracino, D. Vitali, Dijon, pp. 37–62.

Pič 1903 — J. L. Pič, *Hradiště u Stradonic jako historické Marobudum* [The Hillfort at Stradonice as the Historical Marobudum], (= *Starožitnosti země České* II, *Čechy na úsvitě dějin* 2), Praha.

Pieta 2010 — *Die keltische Besiedlung der Slowakei. Jüngere Latènezeit* (= *Archaeologica Slovaca Monographiae. Studia* XII), Nitra.

Pietrzak 1997 — M. Pietrzak, *Pruszcz Gdański, Fundstelle 10. Ein Gräberfeld der Oksywie- und Wielbark-Kultur in Ostpommern* (= *Monumenta Archaeologica Barbarica* IV), Kraków.

Riederer 2003 — J. Riederer, "Die Metallanalyse keltischer Fibeln aus Manching", *Berliner Beiträge zur Archäometrie* 20, pp. 23–30.

Schwab 2014 — R. Schwab, "Resources and recycling: Copper alloys and non-ferrous metalworking in the oppidum of Manching (Germany)", [in:] *Under the Volcano. Proceedings of the International Symposium on the Metallurgy of the European Iron Age (SMEIA) held in Mannheim, Germany, 20–22 April 2010* (= *Forschungen zur Archäometrie und Altertumswissenschaft* 5), eds. E. Pernicka, R. Schwab, Rahden/Westf., pp. 175–188.

Sedlmayer 2009 — H. Sedlmayer, *Die Fibeln vom Magdalensberg. Funde der Grabungsjahre 1948–2002 und Altfunde des 19. Jahrhunderts* (= *Kärntner Museumsschriften* 79, *Archäologische Forschungen zu den Grabungen auf dem Magdalensberg* 16), Klagenfurt am Wörthersee.

Wielowiejski 1991 — J. Wielowiejski, "Chronologie und Zustrom von Bronzegefässen aus der späten römischen Republik nach Mitteleuropa", *Acta Archaeologia Carpathica* XXX, pp. 141–166.

Woźniak 2020 — M. Woźniak, "New finds of the Jezerine-type fibulae from Poland", *Arheološki vestnik* 71, pp. 173–192.

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