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THE KRYSPINÓW TYPE STATERS

ABSTRACT

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This article examines the type of Celtic coins known as Kryspinów type staters, represented by five known specimens. It provides an archaeological context, highlighting a complex cultural landscape of communities coexisting in the milieu of the La Tène tradition. The Kryspinów type is identified as a local issue, attributed to the Tyniec Group, yet primarily circulating among the population associated with the Przeworsk culture. The paper also presents the results of XRF analysis conducted on two specimens. The iconography of the type, which combines motifs borrowed from shell staters of the Boii and Republican denarii, is discussed, with three classes distinguished based on variations in the reverse design.

Keywords: Kryspinów type staters, Celtic numismatics, Celtic coin finds, Tyniec Group, Przeworsk culture, XRF analysis

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HISTORY AND STATE OF RESEARCH

Among the first coins minted in today's Poland is a relatively uniform group of Celtic staters, referred to in the literature as the Kryspinów/BN 8743 type, or simply as the Kryspinów type. The first recorded example of a coin of the type discussed here came from the collection of Félicien de Saulcy (Robert 1868, 424, no. 1; *ibidem*, 425), along with another one issued in the territory of present-day Poland – a stater of the Late Kraków type (Robert 1868, 424, no. 2; *ibidem*, 425). The former coin was attributed by P. Ch. Robert to the Belgic tribe of the Menapii, naming Utrecht as the findspot, although this information may be considered unreliable (Roymans and Van der Sanden 1980, 184, 246; Rudnicki 2012, 67-68). Robert challenged F. Streber's interpretation of shell staters, from which the Kryspinów type derives, as cult objects (Streber 1862, 158, 159 [704, 705]). Ultimately rejecting their purported religious significance, he described the obverse of the stater belonging to Félicien de Saulcy as 'perhaps a fish', resembling the issues of the Morini or Ambiani, and reverse as an indistinct depiction of a ship. The coin later became part of the collection of Bibliothèque nationale de France (BnF 8743, Catalogue no. 5, Fig. 1: 5). In 1889, E. Muret and A. Chabouillet listed it in a catalogue of 'Gallic' coins in the collection, repeating in a brief description the interpretation of the obverse and reverse proposed by P. Ch. Robert (Muret and Chabouillet 1889, 201, no. 8743). Three years later, the stater appeared in H. de La Tour's 'Atlas de Monnaies Gauloises' (de La Tour 1892, pl. 35, no. 8743). The design of both coins attributed to P. Ch. Robert to the Menapii, including the stater BnF 8743, was described by A. Blanchet (1905, 475) as a deformed 'Regenbogenschüsselchen'. He regarded them as supporting the theory of a Celtic presence on the left bank of the Rhine all the way to the sea, in the time preceding the arrival of Ariovistus. Later, R. Duval (1949, 92) acknowledged that the alleged findspot is not, in itself, sufficient to attribute the coin to the Menapii. Instead, the staters included in his study were considered as a means of identifying the type of ships that might have sailed the Danube and Rhine before the Roman conquest. He interpreted the crescent shape in the lower part of the reverse as a relatively long hull of a boat, devoid of rudder, oars, or main mast. Lines and pellets above the crescent were described as either figures or, in the case of pellets, stars.

Another specimen of one of these staters was excavated in 1995 in the upper layers of a shallow hut (Feature 108), located in the Przeworsk culture settlement in Kryspinów (Catalogue no. 4; Fig. 1: 4). The pottery assemblage from the hut indicates its use in the early Roman period (1st century AD in the absolute chronology), but it also included three fragments of the earlier painted ware of the Tyniec Group. P. Kaczanowski interpreted the presence of the stater alongside the painted ware as evidence of the continued use of products characteristic of the Tyniec Group during the early phase of the Roman period. This implied that the coin, assumed to have been minted around the middle of the 1st century BC, remained in circulation for a long time (Kaczanowski 1996; 1997). P. Kaczanowski attributed

Fig. 1. Kryspinów type staters. 1 – environs of Busko-Zdrój, photo Piotr Adamkiewicz archive; 2 – Charbinowice, Kazimierza Wielka County, photo Tomasz Bochnak; 3 – Orłowiny, Opatów County, Piotr Morawski, Łukasz Bul archive; 4 – Kryspinów, Kraków County, photo Tomasz Bochnak; 5 – Utrecht (uncertain), photo Bibliothèque nationale de France

the stater to the Kraków type, while highlighting the differences between the specimen from Kryspinów and the known coins of the Kraków type, treated as a 'non-homogeneous' group derived from shell staters (Kaczanowski 1996, 128, 129). He surmised that the obverse may depict a fantastic animal and described the motif above the left tip of the crescent on the reverse as a standing figure, with individual details presumably representing a teardrop-shaped head, torso, belt, and legs (Kaczanowski 1996, 128). The attribution of the coin to the Kraków type was rejected by M. Rudnicki (2012, 3, 16) and M. and M. Andrałojć (2012, 49, 50, fn. 36) on grounds of differences in iconography. M. Rudnicki included the coin in the 'Lesser Poland Group' consisting of several local Celtic coinages (Rudnicki 2012, 46, 47). He also pointed out that the BnF 8743 stater and the coin from Kryspinów belong to the same type (Rudnicki 2012, 67). M. and M. Andrałojć considered the prototype of the obverse of both staters to have been a coin depicting the head of the goddess Histiaia (Andrałojć and Andrałojć 2014, 73, 74, 103). They also postulated that the reverses were designed to display an 'illusory composition' of two different images, each revealing itself when the coin is oriented in a specific way. One of the images was allegedly borrowed from ¼ staters of the 'au bateau' series from *Gallia Belgica*, and depicted a ship. At the same time, the other was said to be based on the stater fractions of the Boii, with Athena Alkis standing to the left, holding a spear in her right hand and shield in the left (Andrałojć and Andrałojć 2014, 72, 73, 84, 85, 95, 96, 103). In turn, Ł. Bul has identified Roman Republican denarii depicting a biga as a secondary prototype of the reverse of the BnF 8743 stater, the primary one being a shell stater of the Boii (Bul 2022, 48). The specimen from Kryspinów was described by M. Grygiel and A. Kędzierski as resembling the Kraków type, but lacking some of its features, and they regarded it as perhaps an 'unfinished coin' (Grygiel and Kędzierski 2023, 9).

In 2024, three further staters came to light. The first one (Pazowska 2024, *passim*), found before 2020 in the environs of Busko Zdrój, comes from the archive of the late Piotr Adamkiewicz (Catalogue no. 1; Fig. 1: 1). The second coin (Catalogue no. 2; Fig. 1: 2) was discovered in 2021 by Jan Bulas and Magdalena Okońska in Charbinowice (Bulas and Okońska-Bulas 2024, *passim*). The third one was discovered by Kamil Bilski from the 'Wspólne Dziedzictwo' association in Orłowiny (Fig. 1: 3, Catalogue no. 3) during a field-walking survey using a metal detector. The coin was handed over to Marek Florek at the Sandomierz branch of the Provincial Heritage Protection Office (WUOZ) in Kielce. It is now part of the collection of Muzeum Zamkowe w Sandomierzu. A findspot is known for four of the five coins, which is a relatively high ratio compared to other local types.

Major Celtic minting activity in the present-day territory of Poland, excluding an earlier episode in the settlement at Nowa Cerekwia, Głubczyce County (Rudnicki 2014, 49), most likely began in the 30s BC or later and continued into the first half of the 1st century AD (Bul 2022, 47, 49; Bul, forthcoming). While the dates of the Roman Republican prototypes discussed below fall between 142 and 82 BC, the inflow and use of Roman Republican denarii within the European Barbaricum can often be associated with later periods

(Dymowski 2016, 99-124). Moreover, Roman Republican denarii have been found together with late Celtic coins in several settlements (Dymowski 2016, 80-82). The analysed specimens weigh between 6.72 and 4.9 g, consistent with the Kraków series. The heaviest coin of the Early Kraków type weighs 6.89 g (Bul 2022, 57, Cat. 1.1), while the lightest, an

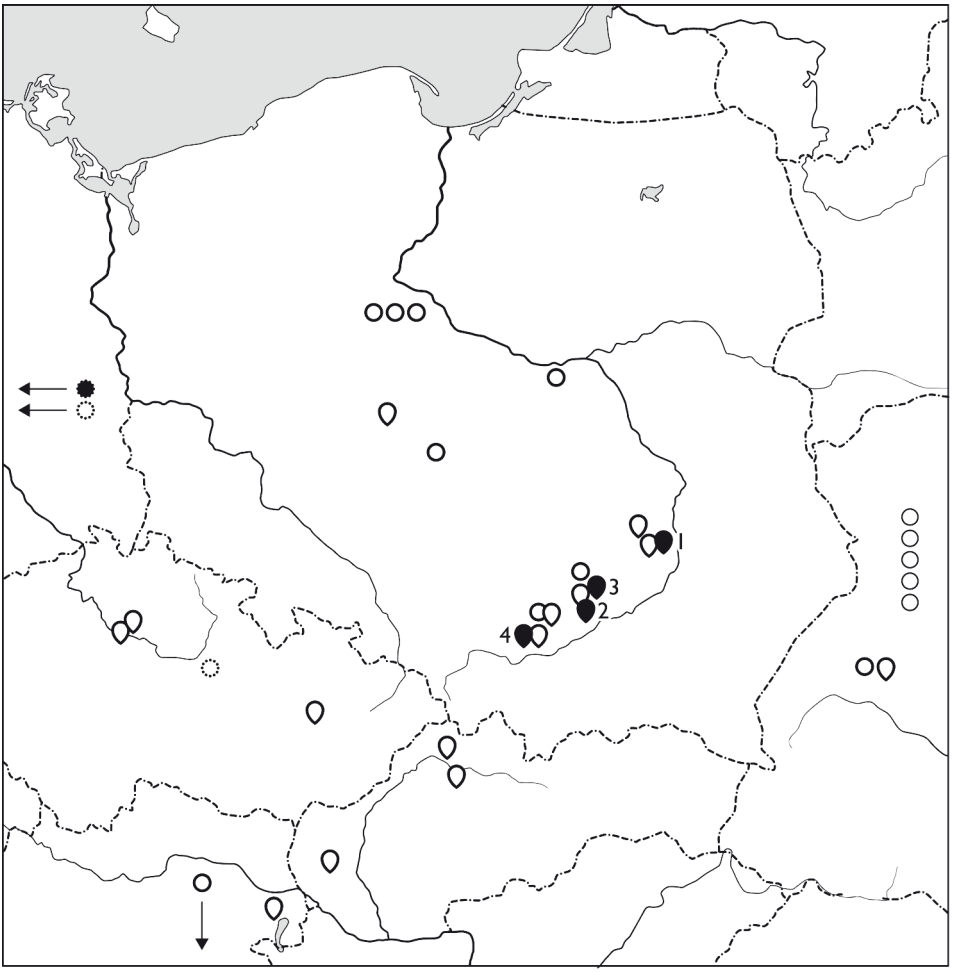

Fig. 2. Distribution of Kryspinów type staters compared to other coins of the Southern Group

unpublished specimen of the Late Kraków type found in Kolín District, Czechia, weighs 4.62 g. The gold content of the analysed Kryspinów type staters ranges from 58.86% to 47.3%, whereas for the Early and Classic Kraków types it ranges from 76% to 45.5% (Bul 2022, 57-58). The *terminus post quem* for the Kraków series is 42 BC (Bul 2022, 49), which, taking the available metrological and metallurgical data into account, allows the earliest issues of the Kryspinów type staters to be placed in the 30s BC or later.

For this period, we can distinguish two main areas of coin production and circulation: the Southern Group, comprising western Lesser Poland, and the Central Group, comprising Kuyavia and eastern Greater Poland. The staters of the discussed type belong to the Southern Group. As opposed to the Kraków series, especially the Late Kraków type, which circulated over a very large area (southern Poland, Kuyavia, Ukraine, Slovakia, Czechia, Austria [unpublished], and Croatia), the coins covered in the article appear to have been confined to a relatively small territory (Fig. 2). The findspots are distributed along the upper Vistula River, contributing to the main concentration of Celtic coin finds originating from the western part of Lesser Poland. The existence of a Celtic mint in the area of Lesser Poland was already considered by Z. Woźniak in 1967 (Woźniak 1967, 210). K. Castelin identified the vicinity of Kraków as the most likely location of the workshop where the coins designated as the Kraków type were produced (Castelin 1976, 266). Local production of coins in the late La Tène period was confirmed in 1976 by the identification of clay moulds for coin planchets, found in 1954 in Kraków-Nowa Huta (Mogiła, Site 1) (Hachulska-Ledwos 1976; Hachulska-Ledwos and Woźniak 1976; Woźniak 1978; 1984). Considering the available data, it can be presumed that the Kryspinów type staters were made in a workshop that operated in the same area as the mint (or mints) issuing coins of the Kraków series.

CONTEXT

As we have indicated, the issues of the Kryspinów-type staters are associated with the functioning of the Tyniec Group and constitute part of the heritage of the La Tène culture. By the term 'Tyniec Group', we understand a syncretic cultural unit that combines features of La Tène and Przeworsk cultures, sometimes with the participation of Dacian or Púchov culture elements, which occupied the territory of western Lesser Poland during the LT D phase. In doing so, we do not address the problem of determining the origins of the Tyniec Group (*cf.*, Bochnak and Dzięgielewski 2020). Economic and social conditions, as well as the clear parallels to the coinage of the Boii, favour such a view.

Western Lesser Poland at the end of the 1st century BC was an area characterised by the coexistence of communities whose material culture exhibited features typical of the La Tène and Przeworsk cultures. However, these elements were found in varying proportions. In some cases, the Celtic components were incidental and considered to be imports; in others, they constituted an important element contributing to the cultural character. The

situation was similar regarding the funerary rites. In most instances, the predominant rite appears to have been that typical of the Celts at the time, elusive with the research methods used today. However, a few cemeteries are known where cremation was used and where quadrangular funerary features have been found (Bejsce, Kazimierza Wielka County; Kryspinów, Site 3; Michałowice, Kraków County, Site 1; Pełczyska, Pińczów County, Site 6). Of special status are the finds from Modlniczka, Kraków County, Site 2, where a large number of pottery fragments and burnt human bones were found in the marshy oxbow lakes of the Wedonka River. Three inhumation graves found in Pełczyska (Rudnicki 2005a) should be regarded as exceptions to the rule.

In the LT D2 (A3) phase in the Kraków region, newly established settlements and cemeteries overlapped the network of older Tyniec settlements (with a clear Przeworsk component), associated with the influx of a new wave of newcomers – carriers of the Przeworsk culture. The new settlements are often adjacent to older sites of the Tyniec Group. The Tyniec and Przeworsk populations maintained contact with each other, as evidenced by finds attributed to the La Tène culture in the Przeworsk settlements. These artefacts formally have the status of imports (*e.g.*, in Kryspinów or in Jakuszowice, Kazimierza Wielka County).

The situation described above means that, in the case of the cultural landscape in western Lesser Poland in the 1st century BC, we observe numerous similarities linking the Tyniec Group and the Przeworsk culture. At the same time, we often face a lack of clearly defined cultural markers that allow us to indicate the differences between the aforementioned cultural units (with these factors changing over time, and this change is not always possible to grasp precisely). Not surprisingly, archaeologists have often referred to particular sites as 'Tyniec' or 'Przeworsk' arbitrarily, and sometimes their opinions have evolved. In the most widespread view, the Nida River, especially in its lower reaches, was the boundary separating the settlements of the Tyniec Group from the zone occupied by the Przeworsk culture. Towards the end of the La Tène period, the Tyniec Group decreased its range, concentrating mainly around Kraków, and was replaced by the Przeworsk culture communities south of the Nida River (Woźniak 1970, 208-201, 1981, 257; Godłowski 1995a, 83; Kubicha 1997, 305, map 3, 4; Garbacz 2000, 333, 334). This phenomenon can be observed, among other places, in Zagórzyce, Kazimierza Wielka County, Site 1, where a settlement of the Przeworsk culture appeared on the site of a former settlement of the Tyniec Group (Grygiel 2017). As mentioned above, opinions on the cultural affiliation of the sites in question vary considerably and continue to develop. Thus, the cemetery at Pełczyska, Site 6, established already in the A2 phase of the Late Pre-Roman period, was described as a necropolis of the Przeworsk culture, and the settlement contemporary with it was also considered to be a Przeworsk one (Rudnicki 2007, 97). In other more recent publications, M. Rudnicki has described the settlement in Pełczyska as a site of the Tyniec Group (Rudnicki 2004, 399, 400; 2005a, 2005b; Rudnicki and Włodarczak 2007, 220), of the La Tène culture (Rudnicki and Kontny 2002, 146) or the location of a 'Celtic mint'

(Rudnicki 2003, 11-14). It should be noted that Pełczyska and Zagórzyce, Site 1, are places where variously dated La Tène culture elements are particularly well defined and more abundantly represented than, for example, at the settlements in nearby Jakuszowice or Charbinowice (Grygiel 2017; 2022, 339, 340). For this reason, it is difficult to apply a geographical criterion and include all these sites in the Tyniec Group. A less nuanced approach was proposed by M. Grygiel, who referred to the entire phenomenon of settlement in western Lesser Poland in the last centuries BC and at the beginning of the 1st century AD as the Tyniec Group, including also the sites of the 'pure' Przeworsk culture (Grygiel 2022).

In this paper, following K. Godłowski (1995b, 125), we associate the 'La Tène-Przeworsk' settlements with the Tyniec Group, with older traditions, dating to before the D2 stage of the La Tène period or the A3 phase of the Late Pre-Roman period. We also identify the settlements characterised by pottery production (including painted pottery) and elements of the Celto-Dacian style – linked to the influx of people from beyond the Carpathians – as belonging to the Tyniec Group (Woźniak 1990, 76, 79; Poleska 122, 123; Rudnicki 2005b, 195). We associate the Przeworsk culture with sites in western Lesser Poland dating to the A3 phase of the Late Pre-Roman period, where features of the Przeworsk culture (including those of La Tène origin) are definitely dominant. We also associate the cemeteries, dating back to the Late Pre-Roman period, with the Przeworsk culture. However, the relatively small number of cemeteries in Lesser Poland should undoubtedly be seen as a remnant of the La Tène tradition. Regardless of the nomenclature used, the mosaic of cultural influences appears to reflect the influx of culturally distinct population groups from the south and north, as well as long-distance trade contacts. This conveys the syncretic nature of settlement in western Lesser Poland, suggesting a complex political situation that may be related to the multi-ethnic character of the population.

It was under such conditions that local issues of gold coins, including Kryspinów type staters, appeared in the milieu of the La Tène tradition. The exact or approximate location of four out of the five coin finds discussed here is known. Interestingly, their distribution and cultural context indicate a connection with the sprouting settlement of the Przeworsk culture in Lesser Poland during the A3 phase, rather than with the sites of the Tyniec Group. Of course, this cannot, however, determine where they were produced.

The stater from the settlement in Kryspinów, a site dating back to phase A3 of the Late Pre-Roman period, can be associated with the Przeworsk culture (Fig. 2, no. 4). As we have indicated above, the coin was found in the fill of a sunken-floored hut containing finds typical of the A3 phase and possibly the early Roman period. As the stater did not rest on the bottom of the feature – and we do not know the time of the filling of the feature – it is difficult to know precisely when the coin in question reached the layer in which it was found. This could have been the end of the A3 phase, but the beginning of the next phase cannot be ruled out. The settlement at Kryspinów extended across an escarpment above the Vistula valley, on its left bank. A cemetery (Site 1) was located in its immediate vicinity – the largest known necropolis of the Przeworsk culture in Lesser Poland. On the other

side of the Vistula stretched a zone inhabited by people of the Tyniec Group. Less than two km away, on the summit and slopes of a limestone hill rising above the river valley, there was a settlement in Tyniec, Kraków County, Site 1, and further, similar settlements existed at a site known as Tyniec-Zawązie (Zagrodziszcze) (Sites 10 and 13) (Godłowski 1995b, 120) and in Kraków-Skotniki (Sites 2 and 12) (Grygiel 2022, 320). In turn, a little further east, in Kraków-Pychowice, there was another settlement (Site 2), this time with clear elements of the Púchov culture (Naglik and Wichman 1992; Naglik 1996). Certain Púchov influence is also evident in the Kryspinów cemetery, where a Púchov culture vessel was used as an urn in Grave 66 (Godłowski 1995b, 125, photo 81). In Kryspinów, the influence of the Tyniec Group is evident in finds of painted pottery, which appear in both settlement and sepulchral materials (Godłowski 1995b, 125).

The coin find from Charbinowice (Bulas and Bulas-Okońska 2024, passim) is probably connected to the settlement of the Przeworsk culture that existed in the area (Fig. 2, no. 2). This settlement, designated as Site 1, functioned in the A3 phase of the Late Pre-Roman period, as evidenced by the finds of two M-type fibulae, as well as pottery with faceted edges and pottery with geometric decoration in narrow, circumferential bands (Grygiel 2017, 210; 2022, 311; Bratko 2023, 8, 62, 63). This is, so far, the oldest Iron Age-related settlement phase recorded at the site. Significantly, the next phase, *i.e.*, the B1 phase of the early Roman period, is very poorly represented in the archaeological material (Bratko 2023, 63, 64). It can therefore be assumed that the Kryspinów type stater find is more likely related to the settlement dated to the end of the Late Pre-Roman period. Situated by the Młyńska River, the settlement at Charbinowice is part of a settlement cluster located between the lower Nidzica and lower Nida rivers.

The Charbinowice settlement population probably maintained relations with the community from the settlement in Rzemienowice, Kazimierza Wielka County, located about 6.5 km downstream along the Młyńska River (Wroniecki and Barton 2018, 60; http://ug.opatowiec.pl/galeria,,,,,543,n.html, accessed 02.08.2024). There were also nearby settlements in Jakuszowice, Site 2 (approximately 7 km), and Bejsce, Site 1 (approximately 5 km). All these sites were in use during the A3 phase. La Tène imports, such as a glass bead, as well as graphite and painted pottery from Jakuszowice, or graphite pottery from Bejsce, confirm contact with the Tyniec Group. Not far from Charbinowice, there were also settlements in Zagórzyce and Pełczyska, where the Tyniec Group traditions dated back to the middle La Tène period. In Zagórzyce, just 4 km from Charbinowice, a significant collection of Celtic artefacts from the earlier phases of the La Tène period was documented. This included fragments of bracelets, links from men's and women's chain belts, and a Möttschwil type fibula (Grygiel 2017, 205-207; pl. 4). The finds from the settlement complex in Pełczyska, located about 8 km to the north, are similar in nature. The complex consists of a settlement where, among other things, a series of Celtic and Dacian coins were discovered, and a cemetery (Site 6), which functioned from the A2 to B2/C1 phases, the majority being from phases A3 and B1 (Rudnicki 2003, 4-12; Kontny and Rudnicki 2009, 30-37).

The precise findspot or circumstances of the discovery of the stater 'from the environs of Busko Zdrój' is unknown (Fig. 2, no. 1). In the Busko area, Przeworsk culture settlements expanded on a larger scale at the beginning of the Roman period. This horizon is marked by material from the biritual cemetery in Kawczyce, Busko County, located about 4 km south of Busko-Zdrój. However, we also have slightly older finds at our disposal. In this regard, we refer above all to the results of research by S. Nosek and T. Reyman, who not only conducted excavations at a necropolis from the early Roman period (Kawczyce, Site 1), but also located single settlement features dated to the end of the Late Pre-Roman period (Site 2) (Nosek 1947, 134-140, figs 34-38). Subsequently, scarce artefacts associated with the Late Pre-Roman period were also recorded in the cemetery previously investigated by S. Nosek and T. Reyman (Site 1) (Kaczanowski and Poleski 1985, 136, fig. 11: 5). The list of Przeworsk culture finds from the Late Pre-Roman period in Kawczyce is supplemented by the unpublished results of rescue research related to the construction of the Busko-Zdrój bypass. Excavations carried out in 2018 resulted, among other things, in the discovery of a series of artefacts from the 1st century BC, including a 1/8 stater of the Pełczyska type.

In the village of Orłowiny, Opatów County, finds of the Przeworsk culture from the Late Pre-Roman and early Roman periods were recorded at a site designated in the voivodeship monument register as Kaliszany-Folwark, Site 22 (AZP 86-72/431) (Fig. 2, no. 3). During the fieldwalking survey conducted by the 'Wspólne Dziedzictwo' association, a Kryspinów type stater (Catalogue no. 3; Fig. 1: 3) and a denarius of Octavian Augustus (RIC 86b) were discovered (information provided by M. Florek, head of the Sandomierz branch of the Provincial Heritage Protection Office in Kielce). The find of the stater corresponds with the settlement horizon of the Przeworsk culture documented at Kaliszany-Folwark, Site 22. A fieldwalking survey conducted in the area identified a cemetery with materials typical of the Late Pre-Roman period (Kaliszany, Site 1) and a similarly dated settlement in Buszkowice, Ostrowiec Świętokrzyski County, Site 1, situated approximately 2.5 km from Kaliszany-Folwark, Site 22. A fieldwalking survey was undertaken in 1997 by B. Bargieł, A. Zakościelna and J. Libera.

The environs of Orłowiny, as well as the whole area of the Sandomierz Upland, were outside the territory inhabited by the Tyniec Group. Therefore, the Kryspinów type stater found in Orłowiny is considered an import. This is not the only find of this kind from this region; in 2019, a stater identified by Ł. Bul as Late Kraków type was accidentally discovered in the Opatów area (Opatów County) (Bochnak 2020; Bul 2022, 60).

These finds, from the area between the Vistula River and the metallurgical centre in the Świętokrzyskie Mountains, fit the model proposed by M. Rudnicki, who drew attention to the role of the Vistula River in the distribution of staters belonging to the Kraków series, such as those found in Kunów, Ostrowiec Świętokrzyski County, and in the vicinity of Sochaczew, Sochaczew County. The distribution of the other issues, presumably minted in the vicinity of Kraków, also follows this pattern north of the territory occupied by the Tyniec Group (Rudnicki 2012a, 51; 2012b, 185).

In light of the above, the question arises as to whether the staters discussed here travelled north to the region of Ostrowiec and Opatów as a result of down-the-line trade, or whether they indicate the physical presence of the population representing a Tyniec Group population in the foreland of the Świętokrzyskie Mountains. Although conditions allowed for the development of metallurgy in the area, finds confirming the development of iron ore reduction techniques in the Late Pre-Roman period are few and inconclusive. Przemysław Urbańczyk noted that the objects of long-distance exchange were usually luxury goods, as the high cost of transport made trade in items of relatively low value unprofitable (Urbańczyk 1996, 4). In light of these remarks, small coins of very high value appear here as a model object of long-distance exchange, carried out with the participation of many intermediaries. However, this picture is incomplete, as other categories of La Tène imports, above all ceramics, cannot be overlooked. It should be recalled that Z. Woźniak pointed out connections between the Sandomierz Upland and the La Tène zone, above all with the Tyniec Group (Woźniak 1970, 192; 1994, 133, 134; Orzechowski 2007, 221). The presence of newcomers from the south is indicated, in particular, by finds of graphite pottery, *e.g*. from Grzegorzowice, Ostrowiec Świętokrzyski County, Samborzec, Sandomierz County, Świniary, Sandomierz County, and, above all, from the cemetery in Błonie, Sandomierz County, Graves 51 and 211 (Woźniak 1970, 162, 347, 349, 250; Orzechowski 2007, 54). As mentioned above, fragments of vessels typical of the La Tène culture were also found in settlements located between Nidzica and the Nida River. Such pottery serves as a good indicator of the physical presence of the newcomers from the south, as it is difficult to assume that it found its way into the lands occupied by the people of the Przeworsk culture as a result of down-the-line trade. It is more likely that the vessels – after all, a product of little value – were the private property of the southerners, who then disposed of the ceramic containers in which they brought, for example, foodstuffs for their own use. Imported glass beads, fibulae, and weapons are also known from the aforementioned necropolis at Błonie (Woźniak and Mycielska 1988). However, these categories of finds are less indicative of the physical presence of the La Tène population than ceramics (Bochnak 2014, 166). Nevertheless, these artefacts also bear witness to links with the Celtic world. Zenon Woźniak noted that La Tène cultural patterns are also evident in local ceramic forms, especially those from the Błonie cemetery (Woźniak 1994, 133). These findings are in line with the views of T. Dąbrowska and T. Bochnak on Celtic imports coming from the south to the area of the Przeworsk culture (Dąbrowska 1988, 123-125; Bochnak 2014, 191-193; fig. 82). The contacts between the people of the Tyniec Group and the Przeworsk culture may be important in the context of the metallurgical centre in the Świętokrzyskie Mountains, the origins of which certainly date back to the younger pre-Roman period. The Sandomierz Upland served as the population base for ancient metallurgy in the Świętokrzyskie Mountains. We should add that fragments of pottery of the La Tène culture (Pokrzywnica, Starachowice County, Stara Słupia, Kielce County) are known from the region of the Świętokrzyskie metallurgical centre (Mycielska 1968, 331; pl. 1: 9; Orzechowski

2007, 74, 75; pl. 1: 2, 3), as is the Late Kraków type stater from Kunów, Ostrowiec Świętokrzyski County, Świętokrzyskie voivodeship. These finds, on the one hand, point to the physical presence of members of the Tyniec Group population in the hinterland of the developing metallurgical centre, and on the other hand, to emerging economic relations on a significant scale.

XRF ANALYSIS

The study of historical objects, particularly ancient coins, often revolves around understanding their origin, manufacturing techniques, and authenticity. Among the key tools in this type of research is chemical analysis, which helps to uncover critical information about the composition of metals used in coins and artefacts. However, many historical gold coins remain unanalysed, leaving gaps in our understanding of ancient minting practices and trade routes. Analytical methods, such as X-ray fluorescence (XRF) spectroscopy, have emerged as crucial tools for performing non-destructive examination, while providing archaeologists and historians with valuable data without damaging precious artefacts (del Hoyo-Melendez 2015). XRF spectroscopy is a widely used technique for analysing metallic artefacts. It works by directing X-rays at an object, which excites the electrons within the material (Klisińska-Kopacz 2024). These electrons then emit secondary X-rays, which can be measured to determine the elements present in the sample. Since XRF focuses on the surface of the object, it provides a detailed analysis of the material's outermost layer. In contrast to other analytical methods, which may require the removal of a physical sample, XRF allows the preservation of the object's integrity. XRF can detect a broad range of elements from sodium to uranium.

One significant challenge in the analysis of ancient coins is the impact of corrosion. Corrosion can cause substantial changes in the surface composition of a coin, resulting in misleading results if the surface is analysed without taking these changes into account (Constantinides 2002). This is particularly problematic for coins made of alloys containing metals such as silver and copper, which are more prone to oxidation and corrosion than gold (Scott 1983). When silver and copper oxidise, they can form compounds that alter the surface of the coin, resulting in a composition that differs from the coin's interior. For example, silver-copper alloy coins often exhibit surface enrichment in silver due to copper depletion. This phenomenon is well documented and poses challenges for accurate chemical analysis (Nord 2020). Gold coins, although less prone to corrosion, can still show surface enrichment either due to the migration of silver or copper away from the surface over time (Blet-Lemarquand 2020) or from ancient metallurgical treatments aimed at enhancing the appearance of the coin. This results in a higher apparent gold content on the surface than in the coin's bulk material.

For a more comprehensive analysis, additional techniques that can probe deeper into the object are often required. One such complementary technique is laser ablation inductively

coupled plasma mass spectrometry (LA-ICP-MS). This method uses a laser to remove microscopic amounts of material from the coin's surface. The removed material is then analysed to determine its elemental composition at various depths, providing a more complete picture of the coin's overall composition (Blet-Lemarquand 2020). LA-ICP-MS can detect trace elements with extremely high sensitivity and is particularly useful for identifying minor components of the alloy that may not be detectable with XRF alone. LA-ICP-MS also enables depth profiling, which is essential for understanding how a coin's composition changes from the surface to its core. This technique is particularly useful for coins that show surface enrichment, as it can reveal the true composition of the underlying material.

One of the key reasons XRF has become so widely used in numismatic studies is its non-destructive nature. Unlike traditional chemical analyses, which may involve cutting or removing samples from an object, XRF preserves the integrity of the coin being studied. This is crucial for the conservation of historical artefacts, particularly those that are rare or hold significant cultural value. However, it should be noted that XRF spectrometry is a surface method, and the depth of X-ray penetration does not exceed several dozen micrometres.

The X-ray fluorescence analysis was performed in the Laboratory of Analysis and Non-destructive Investigation of Heritage Objects (LANBOZ) at the National Museum in Kraków. XRF measurements were performed using the S1 Titan LE spectrometer (Bruker) equipped with an X-ray tube (Rh) with parameters of 15 μA, 50 kV and a semiconductor energy dispersion detector. The radiation beam had a cross-section of less than 5 mm. The tests were performed in an air atmosphere. The spectrum accumulation time was 30 seconds. Measurements were performed in selected places of the objects in the first mode of spectrometer operation. During the measurement, a series of emission lines K, L, M with energy characteristic for a given element were recorded. The semi-quantitative composition of elements for each object was determined automatically using software based on standard-free analysis algorithms. To assess the expected accuracy of the measurements, a certified reference material with a composition similar to the tested object was used. The results are presented in Table 1. The summary of the results, including the percentage content of individual elements, their average values, and relative standard deviation (RSD), is presented in Table 2. The relative measurement uncertainties for the XRF method using the S1 Titan LE handheld spectrometer are: <0.3% for Cu Kα, and <1.3% for Sn Kα, respectively. The LOD (limit of detection) values in the tables do not indicate that a given element was not detected. It is information that its presence has not been confirmed with sufficient statistical verification. In accordance with the standard criteria, it was assumed that the calculated concentration must exceed the LOD at least three times.

The surface of the gold coin from Orłowiny revealed the presence of the following main elements: gold (Au) and silver (Ag). The average values of Au and Ag are 58.93% and 38.93%, respectively. Additionally, minor elements that are likely associated with impurities were identified: copper (Cu) and tin (Sn) in a total amount of 2.15%.

Table 1. Summary of the results of elemental composition measurements [%] of the surface of the certified reference material (MBH Analytical LTD)

Result	Cu [%]	Sn [%]	Pb [%]	Fe [%]	Ni [%]	Zn [%]	As [%]	Sb [%]	Ag [%]
Reference value	78.97	15.90	0.86	1.00	0.67	0.60	0.056	0.70	0.09
Measured value + measurement uncertainty	78.98 ± 0.16	14.93 ± 0.13	0.97± 0.03	1.45± 0.03	0.85± 0.02	0.64± 0.02	LOD	0.7± 0.04	0.10 ± 0.02

Table 2. Summary of the results of elemental composition measurements [%] of the surface of the analysed objects

Coin	Sample number	Au (%)	Ag (%)	Cu (%)	Other (%)
Orłowiny	1	59.97	37.56	1.73	Sn 0.74
	2	57.89	40.29	0.98	Sn 0.84
	Mean	58.93	38.93	1.36	Sn 0.79
W 49/95 Kryspinów	1	54.08	41.82	4.11	n.d.
	2	53.90	42.43	3.67	n.d.
	Mean	53.99	42.13	3.89	n.d.

The surface of the gold coin W 49/95 from Kryspinów revealed the presence of the following main elements: gold (Au) and silver (Ag). The average values of Au and Ag are 53.99% and 42.13%, respectively. Additionally, minor elements were identified: copper (Cu) with an average value of 3.89%.

While XRF excels in surface analysis, it is important to recognise its limitations, particularly regarding surface enrichment and corrosion, which may affect the accuracy of results. To obtain a more complete understanding of ancient coins, XRF is often complemented by other analytical techniques, such as LA-ICP-MS and depth profiling, which provide deeper insights into the object's overall composition. However, despite their limitations, the XRF results obtained for both staters – Orłowiny and W 49/95 Kryspinów – reveal similar gold and silver content, indicating that they were produced within a relatively short period, most likely by the same workshop. The results of the analyses, which were independently conducted for two other coins described in the article, do not differ significantly from those presented above either. The gold and silver contents are 53.23% (Au) and 43.94% (Ag) for the stater from Charbinowice (Bulas and Okońska-Bulas 2024, 127, fig. 3:1), and 47.3% (Au) and 47.95% (Ag) for the BnF 8743 specimen. This implies that the Kryspinów type staters represent a relatively short-lived issue, unlike the Kraków series. The minor variations between the Orłowiny and Kryspinów coins are noteworthy, both in terms of copper content and the presence of tin in one of the specimens. This suggests that a slightly different raw material base was used for subsequent batches of coins.

TYPOLOGY

The staters discussed in the article are designated as the Kryspinów type, named after the first recorded coin with a reliable findspot. As with the Early and Late Kraków types, the Kryspinów type originated by combining motifs borrowed from shell staters and Republican denarii. However, unlike the Early and Late Kraków types, where the crescent drawn from a shell stater became the hull of a boat copied from the denarius (Bul 2022, 46, 47, 53, 54), the Celtic and Roman themes on the reverse of the Kryspinów type are superimposed rather than incorporated into each other. The obverse depicts a laureate head, modelled on Republican denarii but reduced to very little detail. The reverse combines the crescent derived from shell staters of the Boii, and a minimal rendition of the common horse-drawn chariot theme borrowed from Republican issues. Within the Kryspinów type, three classes can be distinguished based on variations in the reverse design.

Class 1a is represented by a single coin – the stater found in the environs of Busko Zdrój (Cat. 1, dies O1-R1). The abstract depiction of the laureate head on the obverse is based on a Republican denarius, presumably the coin (RRC 361/1) issued by P. Crepusius (Crawford 1974, pl. 47, no. 9), although another type with a similar obverse cannot be excluded. The shape of the head (Fig. 3: 1) can be discerned above the prominent laurel wreath (Fig. 3: 2). Below are three locks of hair (Fig. 3: 3-5), and another hairlock or fringe to the right, above the eye on the denarius (Fig. 3: 6). Even the downy beard of Apollo is

Fig. 3. Obverse prototype of Kryspinów staters, a denarius issued by P. Crepusius (left) and a stater of Kryspinów type (right). Photos Bruun Rasmusen (left), Tomasz Bochnak (right)

Fig. 4. Possible model for Class 3 obverse details, a denarius issued by L. Memmius Galeria (left) and a stater of Class 3 Kryspinów type (right). Photo: American Numismatic Society (left), Bibliothèque nationale de France (right)

Fig. 5. Roman reverse prototype of Class 1a, a denarius issued by M. Baebius Tampilus (left) and a stater of Class 1a Kryspinów type (right). Photo: Classical Numismatic Group (left), Piotr Adamkiewicz archive (right)

reflected by a fine line adjoining one of the hairlocks, as in the prototype (Fig. 3: 7). Facial features are absent, but this by no means an isolated case when it comes to Celtic coinages. In fact, the obverses portraying a wreath alone or a wreath and hairlocks are very common. In particular, the Tótfalu, Simmering and Karancs types (*cf.*, Paulsen 1933, pl. 36, no. 831 – pl. 41, no. 939, pl. 47, no. 1064 – pl. 48, no. 1088; Pink 1939, pl. 19, nos 370 and 371, pl. 26, no. 534-535, pl. 27, nos 542-547; Göbl 1994, pl. 8: nos 19-33; Kostur and Gášpár 2018, 233-240, no. 198-199.2, 249, no. 201.19, 202, 250, 251, no. 204.2-206) should be mentioned, but there are many more examples further west, especially when it comes to the British issues (*cf.*, Sills 2003, 257, fig. 88a-o, 262, fig. 91a-d; Sills 2017, 120, fig. 150-153, 261, fig. 293-297, 269, fig. 300-301, 270, fig. 302-303, 271, fig. 307-308, 272, fig. 309-312 ff). The crescent on the reverse is accompanied by rays emanating from the centre, above. The focal point of the chariot scene is the diagonally arranged motif above the left tip of the crescent, depicting a charioteer. While the exact Roman prototype cannot be identified, due to the simplified nature of the derived image, the denarius (RRC 236/1) of M. Baebius Tampilus (Crawford 1974, pl. 36, no. 4) is a likely candidate. The charioteer on the stater shows similarity to his counterpart on the denarius in several details. The head (Fig. 5: 3), torso (Fig. 5: 2) and legs (Fig. 5: 4, 5) can each be linked to corresponding elements of the figure of Apollo on the denarius. The feature behind the charioteer (Fig. 5: 1) either depicts Apollo's right hand holding a laurel branch (off flan on the denarius shown in Fig. 5), or a wing of Victory copied from another model, like the denarius (RRC 200/1) of Pinarius Natta (Crawford 1974, pl. 32, no. 5). The meaning of the pellets overlaid with diagonal lines, immediately above the left part of the crescent (Fig. 5: 6, 7), is not obvious, but the similar treatment of the charioteer's head points to them also being heads. However, they are not necessarily human heads, contrary to R. Duval's proposal (Duval 1949, 92). The reverse of the denarius of M. Baebius Tampilus, shown in Fig. 5, bears horses with heads also rendered as diagonal lines, albeit in a more naturalistic style. This feature on the stater appears to be a subtle hint at a chariot scene, shown in more detail in Class 3. It cannot be ruled out that the scene was cut in the die first, then part of it became obscured once the crescent was added. Perhaps the traces of lines visible below the left part of the crescent are the remains of it.

Class 1b shares both dies with Class 1a, although the reverse die is recut. Two of the five known coins can be included in this class, the staters from Charbinowice (Cat. 2, dies O1-R1.1) and Orłowiny (Cat. 3 dies O1-R1.1). The obverse is the same as in Class 1a. The silhouette of the charioteer on the reverse is different, due to recutting following minor die deterioration. The feature behind the charioteer now consists of two parts, with a possible parallel on the reverse of the denarius (RRC 223/1) of C. Curiatius Trigeminus (Crawford 1974, pl. 35, no. 4). The globule-shaped upper part (Fig. 5: 2) corresponds to the head of Victory crowning Juno, while the lower part (Fig. 5: 1) is her body. As for the recut figure of the charioteer, similarities can also be found with the Juno depicted on the denarius – the shape of the head (Fig. 5: 3) and the right arm (Fig. 5: 4). In this case, however, there is no

Fig. 6. Roman reverse prototype of Class 1b, a denarius issued by C. Curiatus Trigeminus (left) and a stater of Class 1b Kryspinów type (right). Photo: Leu Numismatik (left), Tomasz Bochnak (right)

Fig. 7. Roman reverse prototype of Class 2, a denarius issued by C. Gargonius, Ogulnius and M. Vergilius (left) and a stater of Class 2 Kryspinów type (right). Photo: Tauler & Fau (left), Tomasz Bochnak (right)

certainty about the prototype, due to the level of abstraction and the existence of other possible models, such as reverses with a figure of the winged Victory in biga, triga or quadriga.

Class 2 is known from the coin found in Kryspinów (Cat. 4 dies O1-R2). The obverse die is the same as in class 1, but in a deteriorated state. The reverse die is new. The rays in the right part of the field above the crescent are replaced by densely packed short, irregular striations. The left part of the field retains the pronounced charioteer motif, surrounded by indistinct features. The motif was already recognised as a standing figure by P. Kaczanowski (Kaczanowski 1996, 128). An analogy can be found on the reverse of the denarius (RRC 350A/2) of C. Gargonius, Ogulnius and M. Vergilius (Crawford 1974, pl. 46, no. 6). The easily discernible features of the charioteer figure on the stater can be assigned to corresponding details on the denarius – the head of Jupiter (Fig. 7: 4), his torso (Fig. 7: 3), abdomen (Fig. 7: 2), and mantle (Fig. 7: 1).

Class 3 is represented by the stater kept in the Bibliothčque nationale de France (BnF 8743, Cat. 5, O2-R2). Both dies are new, unless the obverse is a heavily recut die O1. The differences between the obverse of Class 3 and Classes 1-2 are rather minor. The three hairlocks (Fig. 4: 1-3) are elongated with slightly hook-shaped ends, as on the denarius (see Crawford 1974, pl. 41, no. 18) of L. Memmius Galeria (RRC 313/1, mirrored image of obverse on Fig. 4). The BnF 8743 stater is the most important of all known specimens of the Kryspinów type in terms of iconography. In addition to the crescent and rays copied

Fig. 8. Roman reverse prototype of Class 3, a denarius issued by L. Flaminius Chilo (left) and a stater of Class 3 Kryspinów type (right). Photo: Classical Numismatic Group (left), gallica.bnf.fr, Bibliothèque nationale de France (right)

from a shell stater, its reverse bears the most complete chariot scene, depicting not only a charioteer, but also horses. This reinforces the identification of the motif depicted in reduced form on staters belonging to Classes 1 and 2. As has been noted before (Bul 2022, 48), the ubiquity of the theme on Republican denarii and its abstract portrayal on the BnF 8743 stater prevent the identification of a specific prototype. However, the denarius (RRC 302/1) issued by L. Flaminius Chilo (Crawford 1974, pl. 41, no. 1) serves as a good example. The elements on the reverse of the stater can be linked with the corresponding details on the reverse of the denarius: Victoria driving the biga (Fig. 8: 2) wearing a mantle (Fig. 8: 1), the horses' hind legs (Fig. 8: 3), the body of the right horse (Fig. 8: 4), the horses' heads (Fig. 8: 5, 6) and the horses' forelegs (Fig. 8: 7).

The phenomenon of combining the iconography of shell staters prevalent among the Boii with extremely simplified motifs borrowed from Roman coins is characteristic of the Southern Group. At least five stater types fit this pattern, including the Kryspinów one. The Southern Group types include the Early Kraków, Classic Kraków, Late Kraków, Kryspinów, and an exceptionally rare stater known from only two specimens (Bul, forthcoming). In contrast, instances of iconography derived from Roman denarii are found only occasionally in Central Group coinages. While the incorporation of Roman motifs into shell staters is unique to local issues, parallels can be found in coins from the Bratislava mint in terms of Roman influence. Shell staters bearing Latin inscriptions of Biatec and Nonnos (*cf.*, Musilová *et al.* 2015; Militký and Torbágyi 2021) provide the best analogy, but mention should also be made of silver tetradrachms, which not only bear Latin inscriptions but are often based on Roman prototypes (*cf.*, Ondrouch 1958; Göbl 1994; Röttger 2015). Finally, it should be noted that most of the Roman prototypes listed above are attested by multiple finds from Poland (Dymowski 2016).

CATALOGUE

1. Kryspinów type, Class 1a, dies O1-R1, 6.72g. Fig. 1: 1.
Findspot: environs of Busko-Zdrój, Świętokrzyskie Voivodeship, Poland.
Literature: Pazowska 2024.
Collection: private.

2. Kryspinów type, Class 1b, dies O1-R1.1, 6.51g, 16 mm. Fig. 1: 2. Au: 53.23, Ag: 43.94, Cu: 2.82. Mean values calculated from data provided separately for obverse and reverse, pXRF analysis by Jacek Soida, MA, from the Silesian Museum in Katowice.

Findspot: Charbinowice, Kazimierza Wielka County, Świętokrzyskie Voivodeship, Poland.

Literature: Bulas, Okońska-Bulas 2024.

Collection: Muzeum Historyczno-Archeologiczne w Ostrowcu Świętokrzyskim.

3. Kryspinów type, Class 1b, dies O1-R1.1, 6.29 g, 16.5 mm. Fig. 1: 3. Au: 58.86, Ag: 38.92, Cu: 1.09. The X-ray fluorescence analysis was performed in the Laboratory of Analysis and Non-destructive Investigation of Heritage Objects (LANBOZ) at the National Museum in Kraków.

Findspot: Orłowiny, Opatów County, Świętokrzyskie Voivodeship, Poland.

Literature: Bochnak 2024.

Collection: Muzeum Zamkowe w Sandomierzu.

4. Kryspinów type, Class 2, dies O1-R2, 5.8 g, 16.2 mm. Fig. 1: 4. Au: 53.99, Ag: 42.13, Cu: 3.89. The X-ray fluorescence analysis was performed in the Laboratory of Analysis and Non-destructive Investigation of Heritage Objects (LANBOZ) at the National Museum in Kraków.

Findspot: Kryspinów, Kraków County, Lesser Poland Voivodeship, Poland.

Literature: Kaczanowski 1996; Kaczanowski 1997; Rudnicki 2012; Andrałojć and Andrałojć 2014.

Collection: Instytut Archeologii UJ, Kraków (W. 49/95).

5. Kryspinów type, Class 3, dies O1-R3, 4.9 g, 16.7 mm. Fig. 1: 5. Au: 47.3, Ag: 47.95, Cu: 3.92.

The X-ray fluorescence analysis was performed by Sylvia Nieto-Pelletier (Institut de recherche sur les Archéomatériaux, Centre Ernest-Babelon, UMR 5060 CNRS-Université d'Orléans) and Camille Bossavit (Institut de recherche sur les Archéomatériaux, Centre Ernest-Babelon, UMR 5060 CNRS-Université d'Orléans).

Findspot: Utrecht, Netherlands (uncertain, see Roymans and Van der Sanden 1980, 184, 246; Rudnicki 2012, 67, 68).

Literature: Robert 1868; De la Tour 1892; Duval 1949; Castelin 1970; Roymans and Van der Sanden 1980; Rudnicki 2012; Andrałojć and Andrałojć 2014; Bul 2022, https://gallica.bnf.fr/ark:/12148/btv1b112909248, accessed on 28 April 2024.

Collection: Bibliothèque nationale de France, Paris (BnF 8743).

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In this text, for stylistic reasons, the term 'Celtic' is used as a synonym for 'that of La Tène culture.' It does not have the value of an ethnic designation in this case, since the identification and self-identification of the people of the La Tène culture in many parts of Central Europe remain unknown (Collis 2009).

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