

Anna B. Kowalska, Ewelina Miśta-Jakubowska,
Władysław Duczko, Renata Czech-Błońska

Early medieval silver hoards from Pomerania – a perspective of interdisciplinary research

Wczesnośredniowieczne skarby srebrne z Pomorza – perspektywa badań interdyscyplinarnych

Abstract: This year selected items from Pomeranian silver hoards have been included in the interdisciplinary research conducted as part of the study on Slavic-Scandinavian relations in the Early Middle Ages from the perspective of coin, raw material and silver jewellery deposits.

Keywords: Pomerania, Early Middle Ages, silver hoards, interdisciplinary research

Abstrakt: Wybrane elementy ze skarbów srebrnych z Pomorza w bieżącym roku zostały włączone do badań interdyscyplinarnych prowadzonych w ramach studiów nad relacjami słowiańsko-skandynawskimi we wczesnym średniowieczu z perspektywy depozytów monet, surowca i biżuterii srebrnej.

Słowa kluczowe: Pomorze, wczesne średniowiecze, skarby srebrne, badania interdyscyplinarne

The intensification of work on the reconstruction of the natural and cultural landscape on the southern Baltic coast in the Early Middle Ages resulted in new data allowing for a better understanding of the formation process and functioning of the network of economic and cultural connections between Scandinavia and Central Europe (Jöns, Kowalska 2018; 2021, with previous literature). At the beginning of the Middle Ages, heterogeneous communities developed around the Baltic Sea, creating centres for the production and distribution of goods not only necessary in key manufacturing sectors, but also desired among the then elites. On the southern coast, these specific centres were formed among the Slavs who came to Pomerania in the 6th and 7th centuries (Leciejewicz 2000, 144–175). The problem of the origin of the Slavs as well as their relations with the Germanic population occupying the Baltic areas in earlier periods remains an open issue. According to some researchers, Slavic tribes occupied areas abandoned by their predecessors in the mid-6th century

(Dulnicz 2001, 206–213). Another theory, recently supported by the results of the palynological analyses (Jöns, Müller-Wille 2015, 218–220; Latałowa 2017), suggests a meeting of Germanic and Slavic tribes (Mangelsdorf 2001; Schoknecht 2001, 511–513). The period between the disappearance of cultures with ancient, late Roman traits and the appearance of elements characteristic of the Early Middle Ages is still poorly understood, but the existence of an intermediate link between these periods is possible (Schuster 2017, 42–49). An important issue is the presence of elements of Scandinavian culture in Pomerania at the end of Antiquity and the beginning of the Early Middle Ages, which were adopted by the local population. Another question is finds of assemblages of gold artefacts of clearly Scandinavian origin from the second half of the 5th and early 6th centuries. Scandinavian and Pomeranian relations in the Early Middle Ages still constitute a significant research problem, and the tradition of depositing silver, coins, jewellery and scrap metal is its integral element.

In the light of the current state of research, settlement processes on the southern coast of the Baltic Sea were not uniform. The best recognised and documented area is that occupied by the population of the Dębczyno group, which at the end of the 6th century formed a vast territorial community with a centre in Białogard (Cnotliwy 1999, 75; 2005, 271; Łosiński 2018, 68–71). Other early medieval enclaves, coinciding with settlements from the Migration Period, were identified on the lower Oder, in the Pyrzyce–Stargard Plain, and in the eastern part of Pomerania near Elbląg (Bogucki 2013). So far, 15 multicultural settlements between the *Limes Saxoniae* and the mouth of the Vistula River have been discovered on the southern coast of the Baltic Sea. Most of them contain numerous items that allow to assess the scale and nature of Baltic-related connections and those which reached farther. Among these finds there are Scandinavian artefacts made in accordance with the Scandinavian tradition and style (Chudziak, Kaźmierczak 2015). This group also includes silver deposits from the South Baltic lands, Pomerania, Eastern Holstein and Mecklenburg (FMP II; Herrmann 2002, 309; Kleingärtner 2014, 52–57).

Several hundred deposits of this kind come from all over Pomerania, some of which are currently stored in the National Museum in Szczecin. Hoards from the Szczecin museum, consisting of Persian, Arabic and European coins, silver ornaments – complete and fragmented, and various types of wires, bars, ingots and silver scrap intended for further processing most often come from pre-war collections, from the entire province of Pomerania at that time (Kowalski, Filipowiak 2012). However, only coins were fully studied. Ornaments and their parts, as well as silver scrap have not yet been a subject of comprehensive archaeological studies, nor have they undergone detailed and advanced specialist analyses. The most beautiful items, mainly coins and ornaments, completely preserved, were presented only on temporary exhibitions.

Early medieval hoards from the Szczecin museum have rich and remarkable history. Recently, unique hoards from different places in the former province of Pomerania (Table 1), greatly limited by the turmoil of war and whose elements are now the subject of advanced research, have returned to the Museum after several decades. They were always discovered by chance in connection with agricultural (Kurowo, Pękanino, Widuchowa) or development works (Piaski-Dramino, Noskowo). Various characteristic places were chosen for hiding spots, e.g. under a boulder (Bogucino) or using some other distinctive landscape features (Połczyn-Zdrój, Wicimice) which is impossible to reconstruct today. The most interesting is the discovery of a silver hoard in a pot dug into a megalithic tomb. In some cases, information about the circumstances of the discovery has not survived, and it is only known that all coins and ornaments were deposited in clay vessels, sometimes wrapped in fabrics.

It is difficult to assess the original composition of the hoards today. Archival documentation shows that originally they contained many more ornaments and coins. In the case of the Piaski-Dramino deposit, only about half a kilo survived from the almost 12-kilogram hoard. In many cases, the hoards were scattered or divided among the most important institutions collecting antiquities in Berlin and Szczecin which gathered finds from the province of Pomerania. Many valuable items have been lost irretrievably, and the remaining artefacts are today an invaluable source of research on old technologies and cultural interactions.

In the pre-war period, archaeological finds were collected in Szczecin from the second quarter of the 19th century. On present-day Wały Chrobrego, the City Museum (*Stadtmuseum*) was established, which was then transformed into the Pommersches Landesmuseum. During the Second World War, the most valuable exhibits and collections were evacuated outside the city and hidden in several places on the eastern and western banks of the River Oder. There is no trace of many of them, while some are astonishingly found thanks to the growing social awareness (cf. Kowalski, Kozłowska, Rogalski 2016). Part of the Pomeranian finds that survived the vicissitudes of the war found their way to the museum in Stralsund. Paradoxically, only this part of the Szczecin collection that was not evacuated outside the city has survived. Efforts to regain the Szczecin collection began almost immediately after the military activities had ended. However, it was only in 2009 that an exchange of archaeological objects between German and Polish institutions was successfully completed, which involved a transfer of items from the western part of Pomerania to Szczecin, and from the eastern part to Stralsund. As part of this unprecedented action, objects that returned to the archaeological collection of the National Museum in Szczecin were, for example the preserved parts of hacksilver hoards which are currently undergoing research (Table 1)¹.

¹ Full list see Zaginione-Ocalone 2012.

Research on selected Pomeranian hoards is currently carried out as part of the project “The relations of the first Piast state with the Scandinavian world seen through silver deposits” funded by the National Science Centre and run at the Institute of Archaeology and Ethnology Polish Academy of Sciences in Warsaw (executors: Władysław Duczko, Ewelina Miśta-Jakubowska, Renata Czech-Błońska). Ornaments, mainly women’s, made of precious metals, represent a very important source material for learning about the art, technology and religion of the societies in which they were used (Duczko 2016). Hoards in which the ornaments were located appear in Poland in the mid-10th century. They are the cultural phenomenon which was broadly discussed in the literature and which have a few hypotheses of the subject of its origin. One of them is related to Scandinavia, where deposition of coins and objects made of precious metals was an ancient tradition. It was maintained in the Viking Age (700–1100) (Duczko 2020). In the Polish archaeological material, the hoards are one of the most numerous materials that have not been studied in detail. Numismatic research has made the most significant contribution to the study of their content. Ornaments in hoards were marginal finds, potential of which as a source for various research questions has not been exploited. So far, their typological classification has been made, but as far as technological research and physicochemical analyses are concerned, nearly nothing has been done until recently, apart from simple analyses of the elemental composition. Provenance research carried out as part of the aforementioned project and technological research being part of the project focused on selected hoards from Masovia, Warmia and Świętokrzyskie Voivodeship (“New source of knowledge about the history of the early Piasts. Technological analyses of Slavic ornaments” carried out by the National Centre for Nuclear Research in Otwock) fills the gap in knowledge about ornaments. By means of focusing on interdisciplinary research, it allows for the study of the origin and manufacture of the artefacts (Duczko 2018; Miśta-Jakubowska *et al.* 2019a; 2019b; 2020; 2021). Recently, Pomeranian hoards have been included in the group of the analysed assemblages.

The interdisciplinary research, as already mentioned, is aimed at determining the origin of the silver of which the ornaments and their semi-finished products in the hoards from Poland and Sweden were made. Archaeometric research, i.e. using phenomena and techniques in the field of physics, geochemistry and chemistry for the study of archaeological artefacts, conducted as part of the research on finds from hoards, is aimed at determining their deposit origin and presenting the technology of manufacture, i.e. in the case of ornaments – the manner of making decorations. The research uses techniques based on the interaction of X-rays with matter (scanning electron microscopy with high-resolution X-ray microanalysis, X-ray diffraction, X-ray tomography, X-ray fluorescence),

which provide information about the chemical composition, and this in turn is an important factor in the differentiation of artefacts depending on their method of manufacture, including the study of the method of soldering decorative elements such as granulation or filigree, and relating these results to ancient recipes. This makes it possible to study the spread of technological solutions. These had their origins in the Byzantine goldsmithing, and were then taken over by the first Slavic state of Great Moravia, and then by the Czech Přemyslids. From there, the technology and, as it seems, the artefacts themselves, spread throughout Poland, Kievan Rus and Scandinavia.

The results of the technological research combined with those obtained by means of the high-resolution mass spectrometry technique (research carried out in cooperation with a laboratory in the USA) which analyses the elemental composition at the level of trace elements and isotopes (isotopic ratios of lead, silver and tin are tested) allow for the study of the origin of raw material in the artefacts. They inform where the ore for production was extracted. When listed as a large series of results, they allow for the study of ore circulation and the economy of past societies. Access to the hoards at the National Museum in Szczecin made it possible to work with a rich and diverse material, and even now the preliminary results of physicochemical analyses carried out on ornaments from these hoards can be considered extremely valuable, even revolutionary in some aspects. This is because these results inform us about the relationships of the early Piast state with neighbouring areas, focused on the distribution of the ore and diffusion of the technology of its use, indicating a significant importance of production centres located in Upper Silesia.

Acknowledgements

The work was carried out with the financial support from the National Science Centre in Cracow, Poland (Grant No. 2016/22/M/HS3/00210).

Table 1. Silver hoards from the National Museum in Szczecin
Tabela 1. Skarby srebrne z Muzeum Narodowego w Szczecinie

Location Miejscowość	Way of hiding Sposób ukrycia	Circumstances of discovery Okoliczności odkrycia	Year of discovery Czas odkrycia	Original inventory Zawartość pierwotna	Present inventory Inventory No. Stan obecny nr inwentarza	<i>Terminus post quem / chronology</i> Chronologia
Bogucino ³ , Kolobrzeg district	open clay pot	buried under a large rock	1837	approx. 250 g of coins and ornaments	only 50.3 g of ornaments MNS/A/22214	after 995
Piaski-Dramino ³ , Kamień Pomorski district	clay vessel	near road during tree clearing	1900	over 11 kg of coins and ornaments	ornaments and coins with a total weight of 550 g MNS/A/22223 MNS/A/22244	after 950
Dobrociechy ⁴ , Koszalin district	clay vessel	?	1933	850 g of ornaments and coins	only 90.8 of ornaments MNS/A/22219	11 th century (second half?)
Kurowo ⁵ , Koszalin district	clay vessel	during farm work	1859	ornaments and coins, approx. 50-60 g	ornaments and 5 coins with a total weight of 65.5 g MNS/A/22215	after 991
Kania ⁶ , Stargard district	clay vessel	dug into a megalithic tomb	1847	250 g (?) of ornaments and coins	only ornaments with a total weight of 70.9 g MNS/A/22224	10 th century
Sulino ⁷ , Stargard district	clay vessel	when removing stones near a roadside ditch	1826	?	coins and fragments of ornaments weighing 20.2 g MNS/A/22220	10 th -11 th century
Łupawa ⁸ , Słupsk district	clay vessel	on the river bank	1888	12 or 15 kg	only 184.5 g of ornaments and coins MNS/A/22043	end of the 11 th century – beginning of the 12 th century
Mosina ⁹ , Szczecinek district	clay vessel	in the pasture	1887	ornaments and coins	only ornaments and pieces of wire weighing 27.4 g MNS/A/22228	after 1055
Połczyn-Zdrój ¹⁰ , Szczecinek district	clay vessel	on a hill called Góra Zbójców	1886	over 400 g of coins and ornaments	coins and ornaments weighing 493 g MNS/A/22232	after 996
Stary Chwalim ¹¹ , Szczecinek district	?	?	1933	?	only coins and silver scrap weighing 41.2 g MNS/A/22213	after 978
Noskowo ¹² , Sławno district	clay vessel	when removing trees, by a stone, wrapped in a linen textile	before 1828	over 1 kg of ornaments and coins	only ornaments weighing 81.1 g MNS/A/22230	11 th century?
Pękanino ¹³ , Sławno district	clay vessel	while ploughing the field, next to an urn with ashes	1914	320 g?	only ornaments and coin fragments weighing 122.9 g MNS/A/22231	11 th century
Wicimice ¹⁴ , Gryfice district	clay vessel	at the foot of a hill	1878	1.5 kg of coins and ornaments	9 coins and 12 pieces of silver scrap weighing 23.4 g MNS/A/22238	after 996
Widuchowa ¹⁵ , Gryfino district	clay vessel	at a tributary of the River Oder, while digging potatoes	1867	400 g of coins and ornaments	20 coins and a few pieces of silver scrap weighing 3.3 g MNS/A/22218	after 983

² Zaginione-Ocalone 2012, 331; FMP II 2016, No. 11, 71–74.

³ Zaginione-Ocalone 2012, 349–351; FMP II 2016, No. 37, 148–154.

⁴ Zaginione-Ocalone 2012, 333; FMP II 2016, No. 36, 146–147.

⁵ Zaginione-Ocalone 2012, 337–338; FMP II 2016, No. 124, 299–301.

⁶ Zaginione-Ocalone 2012, 334; FMP II 2016, No. 104, 277–279.

⁷ Zaginione-Ocalone 2012, 356; FMP II 2016, No. 202, 513–514.

⁸ Zaginione-Ocalone 2012, 340–341; FMP II 2016, No. 136, 319–346.

⁹ Zaginione-Ocalone 2012, 342; FMP II 2016, No. 142, 370–372.

¹⁰ According to K. Kowalski, a head of the Archaeology Department of the National Museum in Szczecin, it is likely that when the deposit was stored in the Stralsund Museum the coins from the two hoards, Połczyn-Zdrój and Łupawa, got mixed. Coins, mainly imitation denarii (around 4000 items), were identified to Połczyn-Zdrój. Taking into account the chronology of the youngest types of West Slavic imitation cross denarii and the iconography of the stamps, this assemblage can be dated to the late 11th – first half of the 12th century. There is a high probability that this is part of the dispersed hoard from Łupawa. The collections amassed in the National Museum in Szczecin were mostly consisting of imitations of West European denarii, among which cross denarii of all types predominate. The group also includes several dozen original denarii (mostly preserved in fragments), English denarii of Ethelred II and Cnut, Danish denarii of Sven Estridsen, as well as Saxon denarii of Bernhard II and Otto-Adelaide (Zaginione-Ocalone 2012, 351–352; FMP II 2016, No. 161, 415–419).

¹¹ Zaginione-Ocalone 2012, 354–355; FMP II 2016, No. 194, 474–480.

¹² Zaginione-Ocalone 2012, 343–344; FMP II 2016, No. 150, 389–391.

¹³ Zaginione-Ocalone 2012, 347–348; FMP II 2016, No. 157, 407–409.

¹⁴ Zaginione-Ocalone 2012, 363–364; FMP II 2016, No. 236, 558–566.

¹⁵ Zaginione-Ocalone 2012, 365–366; FMP II 2016, No. 237, 567–569.

Literature

- Bogucki M. 2013. Before the Vikings. Foreigners in the lower Vistula region during the Migration Period and the origins of Truso. W: S. Moździoch, B. Stanisławski, P. Wiszewski (eds.), *Scandinavian Culture in Medieval Poland*. Wrocław, 81–111. Interdisciplinary Medieval Studies 2.
- Bogucki M., Ilisch P., Suchodolski S. (eds.) 2016. *Frühmittelalterliche Münzfunde aus Polen. Inventar II*. Warszawa.
- Cnotliwy E. 1999. Białogard i okolice we wczesnym średniowieczu. W: B. Polak (ed.), *Białogard 1299–1999. Studia z dziejów miasta*. Koszalin, 71–93.
- Cnotliwy E. 2005. Pierwsze dendrodaty z białogardzkiego grodziska. *Folia Praehistorica Posnanienses* 13/14, 271–278.
- Chudziak W., Kaźmierczak R. (eds.) 2015. *The Island in Żółte on Lake Żarańskie. Early Medieval Gateway into West Pomerania*. Toruń.
- Duczko W. 2016. *Moce wikingów. Światy i zaświaty wczesnośredniowiecznych Skandynawów I*. Warszawa.
- Duczko W. 2018. Post-wielkomorawski fenomen. Wczesnośredniowieczna sztuka złotnicza w Środkowej i Wschodniej Europie (Post-Great Moravian Phenomenon. Early Medieval Goldsmithery in Middle and Eastern Europe. W: B. Gediga, A. Grossman, W. Piotrowski (eds.), *Inspiracje i funkcje sztuki pradziejowej i wczesnośredniowiecznej*. Biskupin–Wrocław, 107–119.
- Duczko W. 2020. Skarby. O depozytach kruszcowych w państwie pierwszych Piastów. W: S. Rosik (ed.), *Polska – Pomorze – sąsiedzi (X–XII w.). W kręgu studiów nad początkami średniowiecznej cywilizacji europejskiej*. Wrocław, 53–62. *Scripta Historica Europaea* 4.
- Dulinicz M. 2001. *Kształtowanie się Słowiańszczyzny Północno-Zachodniej. Studium archeologiczne*. Warszawa.
- FMP II – see Bogucki, Ilisch, Suchodolski 2016
- Herrmann J. 2002. Zu Burgen und Handelsplätzen im westslawischen Gebiet. W: K. Brandt, M. Müller-Wille, C. Radtke (eds.), *Haithabu und die frühe Stadtentwicklung im nördlichen Europa*. Neumünster, 303–319.
- Jöns H., Kowalska A.B. 2018. Z badań nad obecnością Skandynawów na południowym wybrzeżu Bałtyku w początkach średniowiecza. *Slavia Antiqua* 59, 121–130.
- Jöns H., Kowalska A.B. 2021. Scandinavians on the Southern Baltic coast. W: H.L. Aannestad, U. Pedersen, M. Moen, E. Neumann, H. Lund Berg (eds.), *Vikings Across Boundaries: Viking-Age transformations II*. London, 42–59.
- Kleingärtner S. 2014. *Die frühe Phase der Urbanisierung an der südlichen Ostseeküste im ersten nachchristlichen Jahrtausend*. Studien zur Siedlungsgeschichte und Archäologie der Ostseegebiete 13, Neumünster.
- Jöns H., Müller-Wille M. 2015. The early phase of Slavic settlement in the South-Western Baltic coastal area – current research in the area between the Bay of Kiel and the Oder River. *Archaeologia Polona* 48, 197–228.
- Kowalski K., Filipowiak W. 2012. Dawne zbiory archeologiczne Muzeum Narodowego w Szczecinie. W: K. Kowalski, D. Kozłowska-Skoczka (eds.), *Zaginione-Ocalone. Szczecińska kolekcja starożytności pomorskich*. Szczecin, 9–34.

- Kowalski K., Kozłowska D., Rogalski B. 2016. „Zaginione – Ocalone”. Odkrycie zabytków archeologicznych ze szczecińskiej kolekcji starożytności pomorskich w Moltowie. *Materiały Zachodniopomorskie* 12, 9–74.
- Kowalski K., Kozłowska-Skoczka D. (eds.) 2012. *Zaginione – Ocalone. Szczecińska kolekcja starożytności pomorskich*. Szczecin.
- Latałowa M. 2017. Przyrodnicze ślady przemian osadniczych między Odrą a Wisłą w I tysiącleciu po Chr. / Natural evidence of settlement changes between the Odra and the Vistula in the first millennium AD. W: A. Bursche, K. Kowalski, B. Rogalski (eds.), *Barbarzyńskie tsunami. Okres Wędrówek Ludów w dorzeczu Odry i Wisły / Barbarian tsunami. Migration Period between the Odra and the Vistula*. Szczecin, 17–24.
- Leciejewicz L. 2000. *Nowa postać świata. Narodziny średniowiecznej cywilizacji europejskiej*. Wrocław.
- Łosiński W. 2018. Rola rzemiosła skandynawskiego w dziejach gospodarczych wczesnośredniowiecznej Europy w świetle badań metaloznawczych noży żelaznych. *Slavia Antiqua* 50, 21–80.
- Mangelsdorf G. 2001. Die Drachenfibel von Nehringen und das Problem der Vendelzeit in Vorpommern. W: M. Meyer (ed.), ...*trans Albim Fluvium. Forschungen zur vorrömischen, kaiserzeitlichen und mittelalterlichen Archäologie. Festschrift A. Leube*. Rahden / Westfalen, 493–504.
- Miśta-Jakubowska E., Czech-Błońska R., Duczko W., Gójska A., Kalbarczyk P., Żabiński G., Trela K. 2019a. Archaeometric studies on early medieval silver jewellery from Central and Eastern Europe. *Archaeol Anthropol Sci* 12, 6705–6723. DOI: 10.1007/s12520-019-00935-z.
- Miśta-Jakubowska E., Czech-Błońska R., Duczko W., Gójska A., Kalbarczyk P., Żabiński G., Trela K. 2019b. Origin and production of silver in early medieval Poland. *Archaeologia Polona* 57, 241–255. DOI: 3858/APa57.2019.017.
- Miśta-Jakubowska E., Czech-Błońska R., Duczko W., Gójska A., Kalbarczyk P., Żabiński G., Trela K. 2020. Correction to: Archaeometric studies on early medieval jewellery from central and Eastern Europe. *Archaeol Anthropol Sci* 12, 108. <<https://doi.org/10.1007/s12520-020-01071-9>>.
- Miśta-Jakubowska E., Czech-Błońska R., Duczko W., Gójska A., Żabiński G., Ciepiewski P., Diduszko R., Kosińska A., Brojanowska A. 2021. Research on chemical soldering in early medieval jewellery: the case of lunula-type Viking age ornaments. *Archaeometry* (w druku).
- Schoknecht U. 2001. Mögliche Kontakte zwischen Germanen und Slawen in Mecklenburg. W: M. Meyer (ed.) ...*trans Albim Fluvium. Forschungen zur vorrömischen, kaiserzeitlichen und mittelalterlichen Archäologie. Festschrift A. Leube*. Rahden/Westfalen, 511–516.
- Schuster J. 2017. Wiek V. Czas wielkich zmian / Fifth century. The time of great change. W: A. Bursche, K. Kowalski, B. Rogalski (eds.), *Barbarzyńskie tsunami. Okres Wędrówek Ludów w dorzeczu Odry i Wisły / Barbarian tsunami. Migration Period between the Odra and the Vistula*. Szczecin, 41–49.
- Zaginione-Ocalone 2012 – see Kowalski, Kozłowska-Skoczka 2012.

**Early medieval silver hoards from Pomerania
– a perspective of interdisciplinary research**

Summary

Scandinavian-Pomeranian relations in the Early Middle Ages still constitute a significant research problem, and its integral part is the traditions of depositing silver, coins, jewellery and scrap metal. Several hundred deposits of this kind come from all over Pomerania, some of which are currently stored in the National Museum in Szczecin. The hoards from the Szczecin Museum, consisting of Persian, Arabic and European coins, silver ornaments (complete and fragmented), and various types of wires, bars, ingots and silver scrap intended for further processing most often come from pre-war collections from the entire province of Pomerania at that time. So far, only coins have been fully examined. Ornaments and their parts, as well as silver scrap, have not yet been a subject of comprehensive archaeological studies, nor have they undergone detailed and advanced specialist analyses. Research on selected finds from Pomeranian hoards is currently carried out as part of the project „Relationships of the first Piast state with the Scandinavian world seen through silver deposits” funded by the National Science Centre and run at the Institute of Archaeology and Ethnology of the Polish Academy of Sciences in Warsaw (executors: Władysław Duczko, Ewelina Miśta-Jakubowska, Renata Czech-Błońska). Interdisciplinary research using phenomena and techniques in the field of physics, geochemistry and chemistry for the study of archaeological finds is aimed at determining their deposit origin and presenting the technology of manufacture, i.e. in the case of ornaments, how decorations were made.

**Wczesnośredniowieczne skarby srebrne z Pomorza
– perspektywa badań interdyscyplinarnych**

Streszczenie

Relacje skandynawsko-pomorskie we wczesnym średniowieczu nadal stanowią istotny problem badawczy, a jego integralnym elementem są tradycje deponowania srebra, monet, biżuterii i złomu. Z całego Pomorza pochodzi kilkaset takich depozytów, z których część znajduje się obecnie w zbiorach Muzeum Narodowego w Szczecinie. Skarby z muzeum szczecińskiego – złożone z numizmatów perskich, arabskich i europejskich, srebrnych ozdób (całych i pokawałkowanych) oraz z różnego rodzaju drucików, sztabek, placków i złomu srebrnego przeznaczonego do dalszej obróbki – najczęściej pochodzą ze zbiorów przedwojennych z całej ówczesnej prowincji Pomorze. Pełnym opracowaniem objęto dotąd jedynie monety. Ozdoby i ich części, a także złom srebrny nie były dotąd przedmiotem kompleksowych studiów archeologicznych ani też nie były poddawane szczegółowym analizom specjalistycznym. Badania wybranych elementów ze skarbów pomorskich są obecnie prowadzone w ramach projektu „Relacje pierwszego państwa Piastów ze światem skandynawskim widziane poprzez depozyty srebra”, finansowanego przez Narodowe Centrum Nauki, a realizowanego w Instytucie Archeologii i Etnologii PAN w Warszawie (wykonawcy: Władysław Duczko, Ewelina Miśta-Jakubowska, Renata Czech-Błońska). Badania interdyscyplinarne – wykorzystujące zjawiska i techniki z dziedziny fizyki, geochemii i chemii – mają na celu określenie pochodzenia złożowego zabytków archeologicznych i przybliżenie technologii ich wykonania (w przypadku ozdób chodzi o sposób wykonywania ornamentu).

Dr. hab. Anna B. Kowalska
Institute of Archaeology and Ethnology
Polish Academy of Sciences
a.b.kowalska@iaepan.szczecin.pl
orcid: 0000-0003-2086-0713

Dr. Ewelina Miśta-Jakubowska
National Centre for Nuclear Research
Ewelina.Mista@ncbj.gov.pl
orcid: 0000-0002-0053-8711

Prof. Dr. hab. Władysław Duczko
Institute of Archaeology and Ethnology
Polish Academy of Sciences
wladyslaw.duczko@gmail.com
orcid: 0000-0001-9037-8944

Renata Czech-Błońska
Institute of Archaeology and Ethnology
Polish Academy of Sciences
renata-czech@wp.pl
orcid: 0000-0002-7043-7246