

NOTAE NUMISMATICAE

ZAPISKI NUMIZMATYCZNE



Tom XVII

MUZEUM NARODOWE W KRAKOWIE
SEKCJA NUMIZMATYCZNA
KOMISJI ARCHEOLOGICZNEJ PAN
ODDZIAŁ W KRAKOWIE

Kraków 2022

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ISSN 1426-5435

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Szanowni Państwo,

oddajemy w Państwa ręce tom XVII *Notae Numismaticae – Zapisków Numizmatycznych*. Zgodnie z przyjętymi przez nas zasadami wszystkie teksty publikujemy w językach kongresowych, z angielskimi i polskimi abstraktami. Zawartość całego obecnego tomu oraz tomy archiwalne są zamieszczone w formie plików PDF na stronie internetowej Muzeum Narodowego w Krakowie (<https://mnk.pl/notae-numismaticae-zapiski-numizmatyczne-1>). Na stronie dostępne są ponadto wszelkie informacje ogólne o czasopiśmie oraz instrukcje dla autorów i recenzentów.

Rok 2022 był wyjątkowy dla całego środowiska numizmatyków w Polsce. Pierwszy raz w historii naszego kraju, a ujmując rzecz szerzej – w krajach Europy Środkowo-Wschodniej – odbył się XVI Międzynarodowy Kongres Numizmatyczny, najważniejsze spotkanie numizmatyków z całego świata, organizowane co sześć lat pod auspicjami International Numismatic Council. Wybór Polski, jako miejsca organizacji Kongresu traktujemy jako wielkie wyróżnienie. Głównym organizatorem tego wydarzenia był Uniwersytet Warszawski, a w przygotowaniach uczestniczyły również Muzeum Narodowe w Warszawie, Zamek Królewski w Warszawie, Polskie Towarzystwo Numizmatyczne, Narodowy Bank Polski oraz Muzeum Narodowe w Krakowie. W tym ostatnim przypadku szczególnie zaangażowani w prace nad XVI INC byli pracownicy Gabinetu Numizmatycznego. Całością działań kierował profesor Aleksander Bursche z Wydziału Archeologii Uniwersytetu Warszawskiego, pomysłodawca organizacji Kongresu w Polsce, którego wspierał Komitet Organizacyjny reprezentujący wszystkie najważniejsze polskie ośrodki numizmatyczne. Obrady kongresowe — które zgromadziły ponad 600 uczestników, czy to na miejscu w Warszawie, czy też w mniej licznych przypadkach, dzięki transmisji na żywo, w miejscach ich zamieszkania — uzupełniały liczne wydarzenia towarzyszące: wystawy, koncerty i spotkania.

Muzeum Narodowe w Krakowie przygotowało z tej okazji specjalną wystawę: „Medal prywatnie. Medale w I Rzeczypospolitej (od XVI do XVIII wieku)”, której kuratorem była Agnieszka Smołucha-Sładkowska. Jednocześnie we współpracy z Uniwersytetem Jagiellońskim, krakowskim oddziałem Polskiego Towarzystwa Numizmatycznego, Królewską Biblioteką w Brukseli i Królewskim Towarzystwem Numizmatycznym w Belgii zorganizowano poprzedzającą właściwe obrady Kongresu międzynarodową sesję „Joachim Lelewel and Numismatics in the Nineteenth Century”. W ramach kongresu tradycyjnie opracowany został również Survey of Numismatic Research za lata 2014–2020, w prace nad którym aktywnie zaangażowani byli pracownicy Gabinetu Numizmatycznego: Jarosław Bodzek, Dorota Malarczyk i Barbara Zając. Co więcej, Gabinet Numizmatyczny Muzeum Narodowego w Krakowie był silnie reprezentowany w obradach Kongresu, w czasie których wymienione powyżej osoby wygłosiły referaty. Kongres zakończył się wielkim sukcesem i stanowił znakomitą wizytówkę polskiej numizmatyki.

Redakcja

Dear Readers,

It is with great pleasure that we present volume 17 of *Notae Numismaticae – Zapiski Numizmatyczne* to you. In accordance with the principles that we have adopted, our texts are published in the conference languages with English and Polish abstracts. The whole of the present volume can be found as PDF's on the website of the National Museum in Krakow (<https://mnk.pl/notae-numismaticae-zapiski-numizmatyczne-1>), as are previously published volumes of the journal. The website also contains general information about the journal as well as information for prospective authors and reviewers.

2022 was a special year for the entire numismatic community in Poland. It saw the XVI International Numismatic Congress being held in Warsaw, marking the first time that this most important meeting of numismatists from all over the world, organised every six years under the auspices of the International Numismatic Council, had been held in our country, or more generally in a country from Central and Eastern Europe. The choice of Poland as the venue for the Congress was a great honour. The main organiser of the event was the University of Warsaw, and also involved in its organisation were the National Museum in Warsaw, the Royal Castle in Warsaw, the Polish Numismatic Society, the National Bank of Poland, and the National Museum in Krakow. In this last case, the staff of the Museum's Numismatic Cabinet were particularly active in the work on the INC 2022. In charge of all activities was Professor Aleksander Bursche of the Faculty of Archaeology at the University of Warsaw, who was the driving force behind the organisation of the Congress in Poland, and who was supported in his role by the Organising Committee, representing all major Polish numismatic centres. The congress proceedings, which attracted more than 600 participants, either on-site in Warsaw or, in lesser numbers, thanks to live streaming, were complemented by a wide range of accompanying events, including exhibitions, concerts, and meetings.

The National Museum in Krakow organised a special exhibition for the occasion: "Private medal. Private medals in the 1st Republic of Poland (from the 16th to the 18th century)", curated by Agnieszka Smołucha-Sładkowska. At the same time, an international session on "Joachim Lelewel and Numismatics in the Nineteenth Century", preceding the Congress proper, was organised in cooperation with the Jagiellonian University, the Krakow Branch of the Polish Numismatic Society, the Royal Library of Brussels, and the Royal Numismatic Society of Belgium. As part of the Congress, the Survey of Numismatic Research for the years 2014–2020 was traditionally produced, with Jarosław Bodzek, Dorota Malarczyk and Barbara Zajac of the Numismatic Cabinet actively involved in its preparation. The Numismatic Cabinet of the National Museum in Krakow was also strongly represented in the proceedings of the Congress, where the abovementioned staff delivered papers. The congress was a great success and a real showcase for Poland.

The Editors

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Holt's Fourth Porus Chariot-Type Medallion: A Point-by-Point Rebuttal

ABSTRACT: In this article the authors of an original publication on the so-called Porus medallions of Alexander the Great published a few years ago in the *Journal of the Numismatic Association of Australia* respond to some criticism addressed at their study by F. Holt in issue 15 of this journal (pp. 13–20). The authors' rebuttal is based on mathematical principles and textual analysis.

KEY WORDS: Alexander the Great, numismatics, Porus medallion, probability, ancient sources

ABSTRAKT: Czwarty „medallion Porusa z rydwanem” Holta. Odpowiedź punkt po punkcie

W niniejszym artykule autorzy opublikowanej kilka lat temu w „Journal of the Numismatic Association of Australia”, oryginalnej publikacji na temat tzw. „medalionów Porusa” Aleksandra Wielkiego, odpowiadają na krytykę, jaką

pod adresem ich opracowania przedstawił F. Holt w 15 tomie *niniejszego pisma* (s. 13–20). Odparcie przez autorów wspomnianej krytyki opiera się na pryncypiach matematycznych i analizie tekstu.

SŁOWA KLUCZOWE: Aleksander Wielki, numizmatyka, „medalion Porusa”, prawdopodobieństwo, źródła starożytne

We have recently noted that the paper by Frank Holt¹ puts forward some new information and poses certain questions concerning our paper.² We would like to take this opportunity of responding. We address this letter to the facts of Holt’s arguments rather than to the opinions of a non-factual nature that he has also expressed.

Holt publishes a seemingly hitherto unpublished fourth specimen of the chariot type of Porus medallion. He especially notes that its die axis has been reported to him as 6:00 and that this disproves a supposed attempt by us to prove that the die axis for this type is always 12:00, based on the three previously published specimens all being 12:00. We would like to point out that we were not in fact seeking to prove that all the specimens are 12:00. Instead, we noted that the other two silver Porus medallion types (decadrachm and archer) both have random die axes as do almost all of Alexander’s issues. For example, in Troxell’s study of almost all Alexander’s silver and gold issues, it is stated that “All the series studied exhibit random die axis relationships.”³ We were therefore seeking to demonstrate that the chariot type does not exhibit a random die axis to support our case that it was not struck by Alexander. That is a quite different mathematical objective than to prove that all the chariot type specimens are 12:00 from a sample of 3 specimens.

On the hypothesis that the chariot type has a random die axis and assuming that die axis is specified to the nearest o’clock, so that there are 12 distinct die axes possible (1 o’clock, 2 o’clock, ... 12 o’clock), the random chance of picking 3 successive specimens from a large issue of these coins that all have a 12:00 axis is $1/(12 \times 12 \times 12) = 0.000579$ or one chance in 1728. Hence there is a very strong implication from the first three specimens published that the die axis distribution is not random.

Does the discovery of a fourth specimen with a 6:00 axis change this conclusion? We think not. The two regular die axes to which whole issues often conform are 12:00 and 6:00. Thus, we now need to modify the probability question to ask: what is the chance of randomly picking four specimens with regular die axes (6:00 or 12:00) from an issue with random die axes? For the selection of each specimen,

¹ HOLT 2020.

² HABICHT et AL 2018–2019.

³ TROXELL 1997: XV.

the chance of picking a regular die axis is now $1/6$, so the probability of picking four in succession is just $1/(6 \times 6 \times 6 \times 6) = 0.000772$ or one chance in 1296 tries. Clearly, the discovery of the fourth specimen has not greatly altered the picture that the chariot type does not have a random die axis distribution. There are multiple alternative hypotheses as to why the fourth specimen has a 6:00 die axis that are far more probable than that this type's die axis distribution is nevertheless random, for example:

1. The chariot type die axis distribution is actually a mixture of 12:00 and 6:00 regular die axis specimens.
2. The 6:00 die axis was an accidental misalignment to the opposite regular orientation by the striker.
3. The fourth specimen is a fake.
4. The die axis of the fourth specimen has been incorrectly reported to Holt (it is not clear from the photo provided in his paper that the die axis actually is 6:00).

Therefore, Holt is mathematically incorrect in suggesting that the fourth specimen refutes our claim that the chariot type was not struck by Alexander the Great. Indeed, it tends to confirm that the die axis distribution of this type has some sort of regularity, which is not consistent with the other Porus medallions or nearly all of Alexander's other issues.

Holt also neglects to mention the half-dozen other reasons that we gave to support our conclusion that the chariot type was not struck by Alexander. We regard these as having equal or higher weight to the regularity of the die axis:

1. The chariot type lacks the monograms including BA for ΒΑΣΙΛΕΩΣ ΑΛΕΞΑΝΔΡΟΥ that are seen on all the other Porus medallions (Holt's fourth specimen increases the evidence for this).
2. The other Porus medallions depict scenes associated with the Battle of the Hydaspes (fought in May 326 BC), but the chariot on the chariot type is a 2-man vehicle, whereas the description of the battle in Curtius 8.14.3 specifies that the Indians used 6-man chariots.⁴
3. The circular border on the reverse of the chariot type is a continuous line rather than the usual beading and this is not seen on any other Alexander issue.
4. The style of execution of the chariot coins does not match the style of the

⁴ HEDICKE (ed.) 1908: 301, *senos viros singuli vehebant, duos clipeatos, duos sagittarios ab utroque latere dispositos, aurigae erant ceteri haud sane inermes.*

decadrachm or the archer type, which are engraved to a much higher and more realistic standard.

5. The flan of the chariot type is somewhat too thick relative to its diameter (by roughly 20% to 40%)⁵ to match the fairly consistent flan shape of all Alexander's other silver issues including the other silver Porus medallions.
6. The provenance to connect the chariot type with the other Porus medallions is weak – largely hearsay connecting one specimen only to the 1973 Babylon Hoard.

Finally, Holt in his note 10 makes a claim that the mention in Curtius 8.1.37–38⁶ of Alexander's uncle having called the Persian troops “women” is taken from rhetorical remarks by Livy 9.19.10–11 (who has a similar story).⁷ This is wrong, because N.G.L. Hammond in his *Three Historians of Alexander the Great* considers that Livy is using Cleitarchus in this part of his work.⁸ Hammond also agrees with many historians that Cleitarchus was a major source for Curtius, including specifically for this story.⁹ Therefore, it is clear that Livy, Curtius and also Aulus Gellius¹⁰ all took the story from Cleitarchus, who was an historical biographer of Alexander writing only ~50 years after Alexander's death, so the remarks are historical and not rhetorical as Holt supposes.

We trust that this brief communication will restore balance in the assessment of the new information provided by the fourth chariot type specimen regarding whether this type could reasonably have been struck by Alexander.

REFERENCES

FOSTER, B.O. (trans.) 1926. *Livy: History of Rome*, vol. IV: *Books VIII–X*, Cambridge, MA–London.

⁵ Based principally on personal inspection of specimen E/C2 by co-author Michael E. Habicht, May 2019.

⁶ HEDICKE (ed.) 1908: 256, [y]erum est, ut opinor, quod avunculum tuum in Italia dixisse constat, ipsum in viros incidisse, te in feminas.

⁷ FOSTER (trans.) 1926: 238, [q]uis ad tolerandum laborem melior? Uno proelio victus Alexander bello victus esset: Romanum, quem Caudium, quem Cannae non fregerunt, quae fregisset acies? Ne ille saepe, etiam si prima prospere evenissent, Persas et Indos et imbellem Asiam quaesisset et cum feminis sibi bellum fuisse dixisset, quod Epiri regem Alexandrum mortifero volnere ictum dixisse ferunt, sortem bellorum in Asia gestorum ab hoc ipso iuvene cum sua conferentem.

⁸ HAMMOND 1983: 112.

⁹ *Ibidem*: 151.

¹⁰ ROLFE (trans.) 1927: 283 [17.21.33]. The original Latin version has “...Macedonem ad Persas quasi in gynaeconitum”, which was translated by J.C. Rolfe as “...but the Macedonian was going against the Persians as one of women”. This would be more literally rendered as “the Macedonian ‘was going’ against the Persians as if ‘he were to enter’ the women’s apartments”, a polemical contrast being very obvious between this part of an ancient Greek house and the *andronitis*, reserved to men.

- HABICHT, M.E., CHUGG, A.M., VAROTTO, E. and GALASSI, F.M. 2018–2019. “The so-called Porus medallions of Alexander the Great – crucial historical numismatic objects or clever counterfeits?”, *Journal of the Numismatic Association of Australia* 29: 24–50.
- HAMMOND, N.G.L. 1983. *Three Historians of Alexander the Great*, Cambridge.
- HEDICKE, E. (ed.) 1908. *Q. Curti Rufi, Historiarum Alexandri Magni Macedonis libri qui supersunt*, Leipzig.
- HOLT, F. 2020. “On Probability and Proof: Piecing Together the Puzzle of Alexander’s Elephant Medallions”, *Notae Numismaticae – Zapiski Numizmatyczne* 15: 13–20. DOI: 10.52800/ajst.1.a.01
- ROLFE, J.C. (trans.) 1927. *The Attic Nights of Aulus Gellius*, Cambridge, MA–London.
- TROXELL, H.A. 1997. *Studies in the Macedonian Coinage of Alexander the Great*, Numismatic Studies 21, New York.

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