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WHY WE ANALYZE THE ELEMENTAL COMPOSITION AND WEIGHT OF ANCIENT SILVER COINS

Kevin Butcher and Matthew Ponting, with contributions by Jane Evans, Vanessa Pashley and Christopher Somerfield, *The Metallurgy of Roman Silver Coinage: From the Reform of Nero to the Reform of Trajan*, First paperback edition, Cambridge University Press, 2020, pp. XXXII + 797.

This work was first published in 2010. Currently, it is a well-known item to researchers of ancient coins. The book has already been cited many times. An interesting review was also devoted to it, written by William E. Metcalf, who is undoubtedly one of the greatest authorities in this field.¹ This work, despite its high substantive value, had a major disadvantage. That was its high price. The book, which ought to be not simply read, but studied carefully, was only available in few libraries in Poland. This restricted its access to many people, and greatly limited the possibilities of making use of it. In 2020, it was released in a paperback. The book could be bought at a fraction of its former price, which made it available to even students. Only now can it de facto be treated as reading material that can be read and discussed during classes with students. The book under review belongs to a category of works that can be treated in many aspects. On the one hand, it is a presentation of scientific discoveries, and a voice in the discussion between researchers. It is precisely to this aspect that the review of W. E. Metcalf mentioned above refers. On the other hand, it presents the latest state of knowledge on various topics, and the exact way the various authors came to it. So it has an educational dimension that I would like to refer to. The comments presented below are primarily intended to show its great potential from a didactical point of view.

The work is divided into two parts. The first concerns Roman denarii. The second is devoted to silver coins struck in the east of the Roman

Empire. These are: Cistophori of Asia, the silver coins of Pontus, Lycia, Tarsus, Cyprus, the coinage of Caesarea in Cappadocia, Syria, Tyre, Antioch, and the coinage of Roman Egypt, conventionally called “Alexandrian”. Chronologically, as the title suggests, it covers the period from the reign of Nero to the beginning of Trajan’s reign. The authors, however, go beyond this chronological framework repeatedly, mainly dealing with earlier coins. This applies to both the Mark Anthony’s and Julio-Claudian denarii as well coins minted in the East, especially in Caesarea in Cappadocia, and in Egypt. These are chronological deviations well justified by the narrative of the work. As they themselves write: *Generally, however, imperial monetary history is treated as a story of decline, based on the reduction of the silver content of the coinage. The narrative begins with a pure silver coin under Augustus and ends with a coin of less than 5% silver by the later third century.*² In addition to silver coins, various issues concerning gold coins are raised several times in the book, especially concerning their metrology and presence in hoards.

It should be emphasized that part I of the book, titled General Introduction, stretches to as many as 156 pages. It is divided into the following parts: Roman silver coinage and monetary history, Roman silver coinage and monetary stability, A science on the margins of numismatics: a history of metrological and metallurgical studies, Metrology and hoard analysis, The issue of “finesness”, of instrumental analysis and of data quality, Metallography and the production of denarius

¹ Metcalf W. E. 2016. *Analyzing the silver coinage from Nero to Trajan*, *Journal of Roman Archaeology*, 29, 742-746.

² Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 6.

blanks, The material sampled. We will find there, among other topics, information about the places from where the silver was obtained (not only from mines, but also from recycling), attempts to reconstruct weighing systems, very inspiring comments about the “correlation between fineness and weight”, different weight standards for gold and silver coins, and about the ‘internal corrosion’ of coins. In the next part of the book, we deal with the last issue as witnessed in an example of a denarius of Vitellius (RIC I² 273).³ It is discussed as an example of various techniques applied for producing silver coins. Among the examples given is also one denarius of Domitian *made up of three separate bands of silver*.⁴ Many of the remarks in this and other parts of the work refer to hoards. The authors recall the principle that *coins hoarded are, by definition, coins not circulating*.⁵ It seems an obvious point to make, but still many authors ignore it. One of the conclusions that can be drawn from this work with regard to hoards, is that one also needs to pay special attention to some aspects in dealing with the issues of Domitian, which has not been the case previously.

Part II, The denarius, includes: The Julio-Claudian background, 2 BC to AD 64, The reforms of Nero, AD 64-68, The Civil Wars, AD 68-69: Rome, The western denarii of the Civil Wars, From Vespasian to the reform of Domitian, The reforms of Domitian, From Nerva to the reform of Trajan, AD 96-99, The denarius: summary and conclusions. At this point, the authors also go beyond the declared chronological framework, devoting some space to the denarii issued by Mark Antony. Based on metal analyses, they believe that it is possible that *some of Mark Anthony's legionary denarii were struck in the same mint(s) as the cistophori*.⁶ and that were *made from Siphnian or Macedonian silver*.⁷ The most important passages in this part of the book refer to the reforms of Nero, Domitian, and Trajan. Important information relating to the reform of Nero is the statement that it was carried out in several stages, adjusting the silver content of the denarii,⁸ and that it was related to the transfer of the mint from Lugdunum to Rome,⁹ which necessitated a change in sourcing the silver. The authors present the consequences of

the reform of Nero, its reflection in money circulation and hoards, sometimes in places as far away as India. It is interesting to note that *One place where Nero's post-reform denarii are more abundant is Greece*.¹⁰ Maybe it was related to Nero's journey to Achaia (cf. Dio Cass. 62; Suet., *Nero*, 19). It is very interesting to note that in the times of Otho *'nearly 1000 obverse dies were employed for the gold and silver'*.¹¹ This number is altogether possible. In the course of my research into the coins of Didius Julianus and his wife and daughter, minted within 66 days, I identified 374 denarii dies.¹² An important remark concerning the organization of Roman coinage is the statement that Otho started minting his coins immediately after gaining power, placing on them information about the office of tribune, which he had not yet received officially.¹³ A similar haste in minting coins has already been repeatedly described in relation to other emperors.¹⁴ Here we see a special case of this phenomenon. One of the most interesting parts of the work concerns the reform of Domitian. The minting of pure silver denarii was resumed in the years AD 82-85. Of course, it was not a 100% silver metal in our modern understanding, as can be seen from the table on page 701, but the purest that the Romans could obtain.¹⁵ Interestingly, there are no data to support the claim that this change was due to gaining access to some new sources of silver.¹⁶ Domitian's decision is difficult to explain. Perhaps, as the authors write, *it is possible that Domitian's restorations of the coinage were only intended as a temporary measure, designed to discourage hoarding of old coins and encouraging people to*

³ Ibid., p. 138.

⁴ Ibid., p. 142.

⁵ Ibid., p. 96-97.

⁶ Ibid., p. 164.

⁷ Ibid., p. 198, 687.

⁸ Ibid., p. 211.

⁹ Ibid., p. 233.

¹⁰ Ibid., p. 210.

¹¹ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 248.

¹² Jarzęcki K. 2018. *Mennica rzymska za Didiusza Juliana*, Warszawski Pamiętnik Numizmatyczny, 6, p. 16.

¹³ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 248.

¹⁴ Cf. Jarzęcki K. 2020. *Les pièces de monnaies de l'empereur Nerva provenant de la collection du Musée archéologique et ethnographique de Łódź*, Acta Archaeologica Lodziensia, 66, p. 86.

¹⁵ Cf. Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 17-18. By the way, this fragment of the book under review is worth quoting in the context of the discussion of which Roman coins are ases and which are dupondii and what role is played by the composition of the metal from which they are made.

¹⁶ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 406-407.

return them to the mint for recycling.¹⁷ This part of the work ends with Trajan's reform. In general, the image of Roman coinage presented by the authors differs significantly from what we know from the literature to date.

The third part consists of the following parts: Introduction, Cistophori of Asia, Other provincial silver of Asia Minor, Caesarea in Cappadocia, Syria, Egypt, Provincial silver coinage: summary and conclusions. Next is the Summary of the conclusions of the entire book. As in the case of the denarii, the authors present data that significantly change the current state of knowledge about these coins. We read, inter alia, about a group of cistophori that could have been minted in Rome, but of a different silver than denarii.¹⁸ It is a very interesting case, made more interesting because of the many possible interpretations. As the authors write: *But it would not undermine the possibility that they were produced from recycled denarii, or from the same materials as earlier denarii. It could imply a separate mint in Asia that employed dies shipped from Rome and recycled as raw materials.*¹⁹ Very interesting are the authors' reflections on the relationship between the Nero's reform and the Egyptian tetradrachms.²⁰ Very important in this context are the comments upon the difficulties of conducting research on Egyptian coins due to their interior corrosion.²¹ The authors write that the tetradrachm was in value the equivalent of a denarius.²² One of the many surprising conclusions of the research carried out by the authors is that the tetradrachms of Tiberius and Claudius were minted from recycled denarii or the same raw material as the denarii minted at Lugdunum.²³ A good summary of the key sections of this book on the reforms of the money issued in Rome, which affected the entire Roman Empire, can be found in the following statement: *it is one where fiscal deficits and crises drove successive debasements, leading inexorably towards a lack of public confidence in the coinage, monetary instability and the eventual collapse of the currency system. These crises began at least as early as the reign of Nero and continued to worsen in the decades that followed. We have argued that this perspective needs substantial modification,*

*not only in order to take account of the coinage corrections that occurred during this period, but also to recognise that there may be monetary explanations underlying the changes observed.*²⁴ In the light of the data presented, this is a very convincing statement.

The work also includes the following Appendixes: 1) Silver content of imperial denarii, 2) Gold to silver ratio, 3) Coins of unusual or irregular composition, 4) Denarius hoards of the period from Caligula to Trajan's reform (AD 37-99), 5) Key to Figures. The work concludes with a rich Bibliography.

Any consideration of this book from the perspective of its usefulness as a teaching tool could be supported by a specific example. In Poland, for many years, students were taught using the works of the outstanding numismatist Andrzej Kunisz (1932-1998). They were works at a very high professional level, but 30-40 years have passed since their publication. Let us compare some such information regarding one of the key events in the history of Roman coinage, which was the reform of Nero.

A. Kunisz wrote about the system of denominations, finenesses and weights that they were standards established by Augustus,²⁵ and the authors of the work under review write that its main features *had been established by Julius Caesar.*²⁶ A. Kunisz wrote that coins made of precious metals in the times of Nero were minted *entirely in the capital's mint.*²⁷ In the reviewed book, we read that this took place in Lugdunum, and then in Rome.²⁸ In the work of A. Kunisz we read that *the main reason for the monetary reform and the reduction in the weight of the denarius and aureus was the growing unprofitability of the issue of the former due to the increase in the price of silver. [...]. Nero's reform was therefore not a cyclical move [...], but the necessity of its implementation was determined by the fact that the current monetary system did not keep up with the development of economic life. [...] emission according to the mint rate introduced by Nero ceased to be unprofitable, and the new rules corresponded to the proper*

¹⁷ Ibid., p. 694.

¹⁸ Ibid., p. 476.

¹⁹ Ibid., p. 476.

²⁰ Ibid., p. 626-627.

²¹ Ibid., p. 650.

²² Ibid., p. 667.

²³ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 660.

²⁴ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 699-700.

²⁵ Kunisz A. 1978. *Mennictwo w Cesarstwie Rzymskim w I wieku n.e.*, Katowice, p. 74.

²⁶ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. XXIV, 23.

²⁷ Kunisz A. 1978. *Mennictwo...*, p. 75.

²⁸ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 233.

*relations of the value of the metal.*²⁹ The authors refer to this concept, expressed not in the cited work, but in another article of A. Kunisz³⁰ (by the way, it is the only Polish accent in the entire reviewed work).³¹ The authors write that *While these explanations are not without their merits, another has generally prevailed and become the consensus view: that the Neronian debasement was a direct consequence of Nero's excessive expenditure and subsequent financial difficulties. [...] While some of the literary evidence describing Nero's financial difficulties is quite explicit, it is silent on the link between perilous finances and any changes made to the coinage.*³² They also ask: *If Nero's intention was simply to reduce the amount of silver in the denarius, why did he reduce both the weight and the fineness?*³³ *Nero's debasement was tacit recognition that bimetallism, with a fixed relationship between aureus and denarius, was impossible under current conditions [...] This new overvalued silver coinage helped to maintain the 1:25 relationship of the two precious metal denominations and provided a hedge against further changes in the price of silver bullion.*³⁴ It is very interesting to note that *It may have been the case that Nero's debasement had never been conceived as permanent, and the expectation was that, as soon as any financial difficulties had been resolved, the coinage would revert to its original purity.*³⁵ And *One of the reasons for the choice of weight standard may have been to introduce a greater degree of compatibility between the denarius coinage and the provincial silver issues, in order to simplify the*

*reckoning of taxes.*³⁶ According to A. Kunisz, until the time of Trajan's reform "of the year 107" the old coins from before the reform were in circulation, and *in the period between the reforms of Nero and Trajan, the earlier denarii were not en masse melted down.*³⁷ The authors of the reviewed book are of a different opinion, and they write: *Most of the new denarius coinage was produced from recycled old Republican coinage, and the process of recycling was presumably a profitable operation.*³⁸ Of course, some of the information remains valid, for example that *Since the times of Nero, a silver coin has officially been minted from an alloy with a few percent copper admixture.*³⁹

Even greater contrast is visible in the case of information about the Domitian reform.⁴⁰ This does not in any way diminish the quoted works of

²⁹ Ibid., p. 691.

³⁰ Kunisz A. 1978. *Mennictwo...*, p. 82; cf. Lo Cascio E. 1980. *La riforma monetaria di Nerone: l'evidenza dei ripostigli*, Mélanges de l'école française de Rome, 91-1, 455.

³¹ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 699.

³² Kunisz A. 1983. *Numizmatyka rzymska* [w:] *Vademecum historyka starożytnej Grecji i Rzymu*, red. E. Wipszycka, Warszawa, p. 280; cf. Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 211.

³³ *Cependant l'examen métrologique des monnaies d'or et d'argent du règne de Domitien montre qu'en 82 cet empereur, a effectué une importante restauration de ces catégories de monnaie. Il a quelque peu augmenté le poids du dernier et bien plus celui de l'aureus (dans ce dernier cas il a nettement dépassé les indices théoriques de la taille que Néron avait réduit). Il a également relevé et ramen au niveau tu temps d'Auguste la teneur en métal précieux de la monnaie d'argent. Il est vrai qu'au cours années suivantes du règne de Domitien les deux indices ont subi une légère baisse, mais ils sont restés jusqu'à la fin nettement supérieurs à ceux des prédécesseurs directs de Domitien. Le fait d'avoir pu, sans provoquer de remous importants, améliorer la qualité de la monnaie témoigne d'une certaine stabilité de la situation économique de l'Etat en ce temps et aussi que le trésor disposait de réserves en métal précieux. Il ne faut pas surestimer la restauration de la monnaie d'or et d'argent sous Domitien en 82, car elle n'avait qu'un caractère assez éphémère et n'a pas donné des résultats durables. Mais il est indiqué de souligner que cette restauration était quelque chose d'atypique dans de développement du monnayage romain à l'époque du Haut-Empire. En effet, on avait alors affaire à une baisse constante, bien que très lente, tant du poids des diverses valeurs nominales en or et en argent que de la qualité de l'argent dans les deniers.* (Kunisz A. 1979. *Le monnayage de Domitien (81-96)*, Wiadomości Numizmatyczne, R. XXIII, z. 1, 6-7). Cf. Kunisz A. 1978. *Mennictwo...*, p. 127.

²⁹ Kunisz A. 1978. *Mennictwo...*, p. 78-79.

³⁰ Kunisz A. 1978. 'Quelques remarques sur la réforme monétaire de Neron', in S. Mrozek (ed.), *Les dévaluations à Rome*, I, Rome, 89-97.

³¹ The book would certainly benefit if the authors referred to such works as: Mrozek S. 1975. *Prix et rémunération dans l'occident romain, 31 av. n.è. - 250 de n.è.*, Gdańsk; Mitkowa-Szubert K. 1989. *The Nietulisko Małe hoards of roman denarii*, Warszawa; Kunisz A. 1981. *Uwagi o mennictwie cystoforycznym Hadriana: na marginesie monografii: W. E. Metcalf, "The cistophori of Hadrian"*, *Wiadomości Numizmatyczne*, T. 25, Nr 3-4 (97-98), 192-106.

³² Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 230; in the context of considerations about prices in the time of Nero see: Levi M. A. 1980. *Corso dei prezzi e riforma monetaria neroniana*, Publications de l'École française de Rome, 37-2, 173-183.

³³ Butcher K., Ponting M. 2020. *The Metallurgy...*, p. 233.

³⁴ Ibid., p. 235.

³⁵ Ibid., p. 384.

A. Kunisz, but it is a sample of how great progress has been made.

As we can see, the reviewed book may be of interest to both specialists and students, as well as all those who are looking for a good source of knowledge about coins minted in the Roman Empire. It is a revolutionary work from the perspective of the discoveries presented, which are the best answer to the question why it is worth analyzing the elemental composition and weight of ancient coins. At the same time, it is an excellent textbook, because it shows step by step how the authors came to this knowledge. Numerous references to later times - the Middle Ages and the modern era, are valuable, helping to understand the phenomena studied.

Moreover, and it must be emphasized, this book is written very carefully in terms of the language used. May it become reading and inspiration for students. Let us hope that the authors will fulfill their plans to write its next parts. Maybe they will also want to search in the museums in Warsaw, Łódź and Kraków.

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