

# The bronze enigma: soldiers' pay and civilians' taxes in the Northwestern Roman Empire AD 69-197

Antony Kropff\*

**Samenvatting** – Het traditionele model van de muntcirculatie in de Noordwestelijke provincies van het Romeinse Rijk rust op drie aannames: soldaten werden betaald met zilveren munten maar hadden ook bronzen munten nodig om kleine lokale aankopen te doen; ambachtslieden en anderen die voornamelijk in brons werden betaald, hadden zilveren munten nodig om belasting te kunnen betalen; nummularii (geldwisselaars) boden de noodzakelijke wisselfaciliteiten.

Dit traditionele model wordt in deze bijdrage van de hand gewezen. In het Noordwestelijke deel van het Rijk waren geen nummularii actief. Soldaten ontvingen een deel van hun (zeer beperkt) uitbetaalde stipendia in brons en de lokale bevolking kon sommige belastingen (deels) met bronzen munten voldoen.

**Summary** – The traditional model of coin circulation in the north-western provinces of the Roman Empire rests on three notions: soldiers were paid in silver and needed bronze coins for their small local payments, local craftsmen and other civilians paid mainly in bronze needed denarii to pay taxes and the nummularii (money changers) provided the necessary coin exchange facilities.

We will reject this traditional model. Nummularii did not operate in the Northwestern Empire. Soldiers received part of their (very limited) cash stipendia in bronze and civilians could pay some of the taxes (like poll tax) in bronze coinage.

In the northwestern provinces of the Roman Empire, first- and second-century sites usually yield a coin ensemble with a 90-95% share of bronze coins<sup>1</sup>.

And yet, in the traditional model of circulation the soldiers received their pay entirely in silver coins. For small payments in *vicus* or *canabae* soldiers would have exchanged their denarii for bronze coins, using the services of a *nummularius*, a money-changer. Civilians receiving payments in bronze coins would have obtained the denarii needed to pay taxes from these *nummularii*. All exchange transactions entailed fees.

Roman coin circulation is often visualized in a flowchart. We will focus on one key element, simplified in figure 1, a diagram which summarizes the silver/bronze cycle we sketched above.

---

\* antonykropff@hetnet.nl. The author wishes to thank Fleur Kemmers and the anonymous reviewers for their comments and contributions.

<sup>1</sup> Kemmers, 2009a: 144. In this review, 'bronze coins' is used as a generic term for all copper and copper-alloy coins.

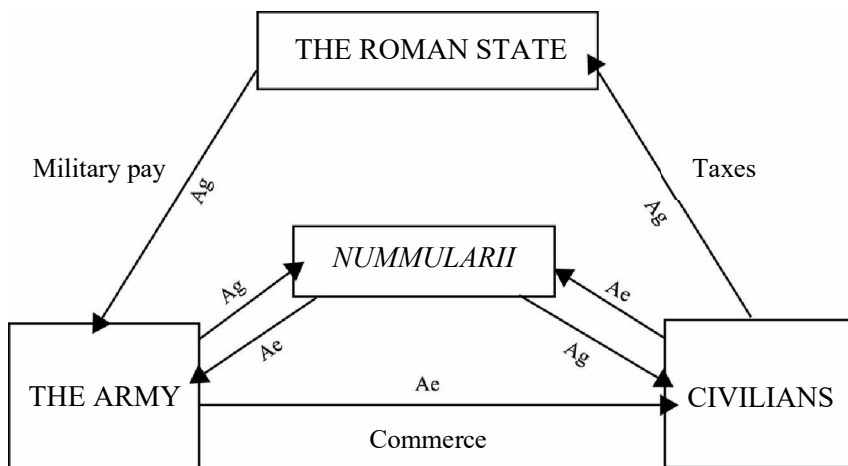


Fig. 1. Detail of the traditional model of coin circulation in the Roman Empire<sup>2</sup>

However, this model of circulation is not documented by literary or epigraphical sources in the provinces Germania Inferior, Germania Superior and Gallia Belgica, the area under review, and consequently their presence and activities in the northwest remain hypothetical. Kemmers and Van Heesch have expressed reservations concerning the traditional model of circulation in this area<sup>3</sup> but the model still has quite a few staunch adherents<sup>4</sup>. The aim of this paper is to review the supposed role of *nummularii* in this part of the Empire. If the presence of *nummularii* cannot be established, the circulation triangles of figure 1 will collapse.

How did bronze coins enter circulation in the area and how did civilians obtain the denarii needed to pay taxes?

We will try to answer these questions by presenting an alternative model of coin circulation in these three provinces.

## Period and area

The provinces Germania Inferior, Germania Superior and Gallia Belgica were under the financial and fiscal accountability of the same procurator, residing in Trier. The chronological coin circulation profiles of bronze coins for the three

<sup>2</sup> Kemmers, 2009b: 139, fig. 1; the author argues against this model.

<sup>3</sup> Kemmers, 2009a: 145; Kemmers, 2009b: 155; Van Heesch, 2007: 85; Kemmers, 2006: 212, 254; Van Heesch, 2000: 164.

<sup>4</sup> Heinrichs, 2000: 164-165, the author also suggests that hypothetically, merchants might have exchanged the bronze coins obtained from their small-scale sales for the soldier's denarii; Andreau, 1999: 37; Hobley, 1998: 139; Harl, 1996: 244.

provinces are similar<sup>5</sup> and differ markedly from the circulation profile in the central and eastern provinces.

We begin our period under review (AD 69-197) with the Flavian emperors because by then the rapid turnover of consecutive emissions of bronze coins in military camps had given way to a gradual increase of the share of old, recycled coins in the coin ensemble of new military sites<sup>6</sup>. The reviewed period ends in AD 197, when Septimius Severus doubled the regular pay of the soldiers in the legions from 300 denarii to 600 denarii<sup>7</sup>. The silver content of the denarius decreased from ca. 63-72% under Commodus to ca. 46% after AD 197<sup>8</sup>. At that time, the Severan bronze coins were no longer sent *en masse* to areas north of the Alps while these coins did circulate on a large scale in the Mediterranean<sup>9</sup>.

We will examine the traditional models of bronze coin circulation within these temporal and geographical limits.

## *Nummularii*

### *Nummularii in the East*

In the Eastern provinces, *nummularii* and other bankers are found in settlements ranging from mayor cities to large villages. Money changers had always played an important role in the Eastern Empire. In classical Greece, their services were required because hundreds of city-states and leagues issued their own currency<sup>10</sup>.

During the Roman Empire, many Eastern cities obtained the right to produce their own bronze (and sometimes silver) civic coins with Greek legends<sup>11</sup>. During the rule of Septimius Severus (AD 193-211) 375 cities and leagues in the Eastern Empire produced civic coins, circulating within a restricted radius of their place of origin<sup>12</sup> although a wider circulation has also been suggested<sup>13</sup>.

The mingling of currencies in the East made the services of *nummularii* indispensable. The money changers Jesus is reported to have driven from the Temple (Matthew 21:12) would have returned within the hour: without them the Temple tax could not have been paid in Tyrian shekels, as one of the commandments of Moses required.

---

<sup>5</sup> Kemmers, 2009a: 156.

<sup>6</sup> Wigg, 1995: 284.

<sup>7</sup> Speidel, 2009: 350.

<sup>8</sup> Butcher & Pointing, 2012: 76-77, see also Duncan-Jones, 1994: 225; Walker, 1988: 300.

<sup>9</sup> Reece 1973; Kemmers, 2009a: 147-149; Kemmers, 2009b: 142, 144; Walker, 1988: 300.

<sup>10</sup> Andreau, 1999: 37.

<sup>11</sup> Van Heesch, 2007: 85, note 28; Andreau, 1987: 512-513.

<sup>12</sup> Harl, 1996: 113.

<sup>13</sup> Howgego, 2014: 309.

Cities in the East granted a monopoly to change coins to (a consortium of) money changers; the income from exchange transactions was subject to a municipal tax<sup>14</sup>. The Hadrianic inscription from Pergamon (OGIS 484) informs us that a denarius could be exchanged for 17 *assaria* (a local coin) while 18 *assaria* could be exchanged for a denarius, resulting in an exchange fee of 5,5-6%<sup>15</sup>. This inscription of Pergamon (an imperial directive on a dispute between merchants and money changers) has been interpreted as an indication of the charges for exchanging asses to denarii or denarii to asses, but this is based on a misunderstanding<sup>16</sup>. Asses were almost completely absent in the East. Consequently this inscription does not give us charges for exchanges within the Augustan currency system, but between parallel currencies. In fact, known Greek texts on exchange transactions are all related to transactions between parallel (Roman vs. local, civic) currencies, not to transactions between Roman denominations reciprocally.

### *Nummularii in the West*

From the northwestern provinces, we have no epigraphic or literary evidence for *nummularii* until two late second- or early third-century inscriptions from Cologne<sup>17</sup>. By that time, the activities of *nummularii* were no longer restricted to assaying and money changing: they had now also become deposit bankers, just like the *argentarii*<sup>18</sup>. Still, these early third-century *nummularii* may have been exchanging Severan denarii for bronze coins. Severan bronze was scarce north of the Alps, but Antonine bronze was still circulating and exchange transactions with these coins could have been offered.<sup>19</sup>

Hardly any inscriptions for *nummularii* have been found in the northwestern provinces, however there is overall a distinct lack of epigraphic evidence for the financial world of the northwestern provinces in comparison with the East. Yet, we should consider that all written sources describing the *modus operandi* and charges of *nummularii* are in Greek; with regard to the actions of money changers in the West we are in the dark<sup>20</sup>.

Notwithstanding the absence of this type of evidence, many authors have thought that *nummularii* played a pivotal role in transport, distribution and circulation of bronze coins in the West, see also figure 1. In recent publications however, the activities of *nummularii* in the West have been questioned, as we mentioned before.

---

<sup>14</sup> Andreau, 1999: 37.

<sup>15</sup> Harl, 1996: 239-241; Andreau, 1987: 518; Macro, 1976: 174.

<sup>16</sup> Hobley, 1998: 139.

<sup>17</sup> Kemmers, 2006: 195-196; Andreau, 1987: 320, table 31.

<sup>18</sup> Andreau, 1999: 31.

<sup>19</sup> Kemmers, 2009a: 147, 158; Kemmers, 2009b: 146, 153, 155.

<sup>20</sup> Noreña, 2011: 194, note 16; Andreau, 1987: 515-518.

We know that individual regions periodically received batches of bronze coins that differed from the consignments distributed to other areas<sup>21</sup>. Sometimes, an entire emission was sent to one province exclusively, for instance the *Britannia*-asses for Hadrian (RIC 577) or for Antoninus Pius (RIC 934) to Britain<sup>22</sup>.

### *Consignments of bronze coins*

Consignments of coins with specific reverse types, relevant to the recipients<sup>23</sup> and contingents of *quadrantes* from one emission were apparently sent to a specific area or army camp<sup>24</sup>. Direct shipments of coin consignments were recognized elsewhere too<sup>25</sup>.

A remarkable consignment of *quadrantes* under Domitian warrants special attention. *Quadrantes* are usually thought to have circulated mainly in Italy during the Julio-Claudian period<sup>26</sup>. However, in the *canabae legionis* of the *castra* of the tenth legion Gemina in Nijmegen, 414 *quadrantes* were found, 304 of which were struck for Domitian<sup>27</sup>. All of the latter coins were of the same type: RIC II<sup>2</sup> 123 (= RIC 436 in the first edition of RIC II), see figure 2. The coins were probably produced in AD 81-82<sup>28</sup>.



Fig. 2. *Quadrans* Domitian (RIC II<sup>2</sup> 123)  
© Classical Numismatic Group (scale 200%)

<sup>21</sup> Kemmers, 2006: 238-244.

<sup>22</sup> Hobley, 1998: 51; Howgego, 1994: 13-14; Walker, 1988: 290-294.

<sup>23</sup> Kemmers, 2014: 232-233; Kemmers, 2006: 219-240.

<sup>24</sup> Elkins, 2017: 18 ff.; Kemmers, 2006: 216-219; Wolters, 2006: 27; Kemmers, 2003: 18.

<sup>25</sup> Van Heesch, 2000: 163; Hobley, 1998: 130.

<sup>26</sup> Kemmers, 2006: 152; King, 1975: 77-78.

<sup>27</sup> Kemmers, 2006: 145, 152.

<sup>28</sup> Carradice & Buttrely, 2007.

In the area of the Rhine limes, these coins were also found in Augst and Vindonissa<sup>29</sup>, Neuss<sup>30</sup> and in smaller numbers in some other Rhine forts. Judging by the quantities, Nijmegen was the hub in the distribution. The coins are found on military sites and did not proliferate to civilian sites, neither rural nor urban. Oddly, type RIC II<sup>2</sup> 123 is rare in Italy and a consignment of these coins seems to have been produced or earmarked for the legion in the Nijmegen *castra*<sup>31</sup>.

In the provinces Gallia Belgica and Britannia quadrantes were very scarce. From the Sacred Spring in the temple for Sulis Minerva in Bath 12,595 coins were recovered, none of which were quadrantes<sup>32</sup>. Of a total of 143,349 coins in the Portable Antiquities Scheme (PAS) database, 11,443 coins date from the quadrantes production period, ending with Antoninus Pius in AD 161. Only eight of these coins were quadrantes<sup>33</sup>.

The large-scale supply of quadrantes by Domitian to Nijmegen is consistent with this emperor's interest in financial and monetary matters and might have been prompted by the emperor's presence on the Rhine during the war against the Chatti in AD 83<sup>34</sup>. Opportunistic distribution by *nummularii* to obtain a profit is very unlikely in view of the unfavourable weight/value ratio of this coinage.

Rather, we recognize the expression of a quite sophisticated and detailed monetary policy.

In addition to targeted consignments and the absence of inscriptions and texts, we will also consider other evidence in relation to the *nummularii*.

### *Legal obstacles*

The Augustan currency system imposed the principle of interchangeability of the various denominations, offering a solid base to the fiduciary coins within the trimetallic system. This has frequently been emphasized by Roman jurists<sup>35</sup>.

Four sestertii would have 'bought' a denarius and so would 16 asses. A loan taken out in a certain denomination could be repaid in a different denomination within the Augustan currency system without costs<sup>36</sup>. Repayment in a currency outside the Augustan currency system however (*'alium formam'*) could be refused<sup>37</sup>.

---

<sup>29</sup> Peter, 2001: 50.

<sup>30</sup> Kemmers, 2006: 159; Kemmers, 2003: 22-27.

<sup>31</sup> Kemmers, 2006: 215-221; Hobley, 1988: 25.

<sup>32</sup> Walker, 1988: 281, 306-309.

<sup>33</sup> McIntosh & Moorhead, 2012: 223-225.

<sup>34</sup> Kemmers, 2006: 216-219.

<sup>35</sup> Scheidel, 2010: 97; Scheidel, 2008: 48-49, note 280; Verboven, 2007: 254; Strobel, 2002: 115-118; Wolters, 1999: 356-362.

<sup>36</sup> R  fner, 2016: 104; Wolters, 1999: 359.

<sup>37</sup> Verboven, 2007: 254; Wolters, 1999: 359.

We can conclude that no discrimination against any Augustan denomination was allowed, which would probably also have hindered charging profitable fees for coin exchanges within the system. In the West only exchanges within the Roman currency, including tolerated copies of asses produced by the army<sup>38</sup> were possible, as no parallel civic coinage circulated and very little foreign currency was available. This might explain the absence of epigraphic and literary evidence for *nummularii* in the north-western Empire.

### *Volume of transactions*

But even in the absence of legal obstacles, we can't envisage profitable activities of *nummularii* in the northwestern Empire.

In the East, *nummularii* operated in a highly monetized, highly urbanized area. Permanent spots were available on markets like the market of Pergamum (OGIS 484) or in public buildings or temples like the temple of Jerusalem. Large volumes of transactions in parallel and foreign currencies were cleared, offering a sound economical basis of existence. Making use of coins already in the eastern coin pool would have kept the cost of transport relatively low.

In the western part of *Germania Inferior*, many areas were underdeveloped, undermonetized and rural in character. In the Dutch River area between Noviomagus (present day Nijmegen) and the North Sea we only find *de jure* towns, not functioning as full *de facto* towns. Noviomagus was a town 'that never made it as such'<sup>39</sup> and Forum Hadriani was in fact a 'failed town'<sup>40</sup>. In this part of the Lower Rhine area we find fifteen castella<sup>41</sup> spread out over a distance of ca. 100 km, each with a garrison ca. 350 soldiers at most<sup>42</sup>.

With these small and infrequent exchange transactions, *nummularii* would not set up their tables in the *vicus* of any castellum. Would soldiers travel to Noviomagus to exchange silver? Are we to imagine mobile, travelling *nummularii*? These options are both highly implausible.

### *Charges*

If *nummularii* supposed to be working in the northwestern Empire would have taken care of the transport of new bronze coinage 'bought' at the Rome mint (most likely without a discount, which would have given rise to fraud), transport would have cost circa 3-5% of the value of the coins, extrapolating and interpreting the cost of transport in the Edict of Maximum prices, issued in AD 301<sup>43</sup>.

---

<sup>38</sup> Van Heesch, 2009: 138.

<sup>39</sup> Willems, 1984: 268.

<sup>40</sup> Kropff, 2010: 226.

<sup>41</sup> Bechert & Willems, 1995: 8.

<sup>42</sup> Van Dinter *et al.*, 2014: 29.

<sup>43</sup> Kropff, 2016.

Adding the exchange charges known from the East (5-6%) would have resulted in a total charge which would have been unacceptable to soldiers and civilians and probably to the Roman authorities.

We think we can safely say that during the period under investigation, *nummularii* thus did not play the assumed pivotal role in the northwestern part of the Empire.

However, the theoretical convenience of having them in the area caused the longevity of the northwestern *nummularii* in scholarly literature. Without *nummularii* it is difficult to reconcile three hypotheses, first: soldiers were paid in silver, second: soldiers needed bronze coins for local small payments and third: pubkeepers, shopkeepers etc. receiving the payments in bronze had to pay taxes in silver coins. The first and last of these three hypotheses need to be re-examined and will be discussed below.

We will suggest a new model for the circulation of bronze coins in the area under review. A caveat: part of this model is in our view decisive (the absence of *nummularii* in the northwest) while the section on coin supply (bronze coins were part of the soldiers' pay) appears to be more plausible than the present model. However, the northwestern taxation cycle proposed below is a speculative hypothesis, intended to invite discussion.

### **Bronze coins as part of the *stipendia***

For the mid-second century, the cost of the army has been estimated at approximately three-quarters of the total yearly budget of the Empire<sup>44</sup>. In the 'military' provinces like the two Germaniae, the supply of new coins followed the army. When the army left a fort, the surrounding area was either deprived of new coins, both silver and bronze, as can be seen in and around Vindonissa after the Legio XI Claudia left in AD 101<sup>45</sup>, or received coins on a dramatically reduced scale, as can be noted in the Nijmegen area after the departure of the Legio X Gemina after AD 104<sup>46</sup>. In the absence of *nummularii* in the area, the army is the only likely candidate to have supplied and circulated the silver coins as well as bronze coins.

Crawford stated that ancient states only produced coins to make state payments and that the subsequent use of coins as a means of exchange was an accidental consequence of their existence<sup>47</sup>. This view is no longer endorsed. After the coins had been produced and the state had made its payments, coins were intended to

---

<sup>44</sup> Duncan-Jones, 1994: 45.

<sup>45</sup> Howgego, 2014: 311, note 36; Wigg-Wolf, 2014: 167; Van Heesch, 2007: 93; Kemmers, 2006: 193.

<sup>46</sup> Kemmers, 2006: 117.

<sup>47</sup> Crawford, 1970: 45-48.



function as a means of exchange<sup>48</sup>. A fully functional monetary system should include denominations of high and low value, to facilitate transactions on all price levels<sup>49</sup>. Transactions and exchange between soldiers and for instance pub-keepers and shopkeepers would have been seriously hampered if the soldiers did not have bronze coins at their disposal. The army had to supply the soldiers with bronze coins as part of their *stipendia*.

Payment of the *stipendia* (partly) in bronze has not been taken into consideration for a long time because of the unfavourable weight/value ratio of these coins. Duncan-Jones suggested why bronze was not used as part of the *stipendia*. The coins needed to pay a single legion during one single year in asses would have weighed 300 tonnes, which would have posed logistical problems and put a strain on the available bullion supplies<sup>50</sup>. However, this calculation is based on the assumption that the *stipendia* were paid in full.

During the reign of the Julio-Claudian emperors, standard legionary pay was 225 denarii a year. The pay was raised by Domitian to 300 d. in AD 84 and by Septimius Severus to 600 d. in AD 197. This yearly pay was due in three instalments (*stipendia*) on the first day of January, May and September<sup>51</sup>. These payments were long thought to have been paid in full, but additional research has meanwhile shown that 50-75% of the soldier's pay was virtual pay, deducted for equipment, food, clothing, boots, hay etc.<sup>52</sup>

A considerable part of the remaining net pay was booked to the soldier's account (*depositum*) only to be paid upon discharge<sup>53</sup>. Surprisingly small amounts of coins actually changed hands on pay day.

A more realistic calculation by Wolters, based on paying one *stipendium* of one legion in asses after a total deduction for supplies of 66% results in a shipment of 30 tonnes of coins. Nevertheless, even this scenario was thought to be implausible<sup>54</sup>. But we have to bear in mind that *stipendia* were by no means exclusively paid in bronze coins, as silver and gold coins would have formed an important component in the army pay, particularly in *donativa* and in the *stipendia* of the higher-ranking soldiers and of the officers. Also, approximately 75-90% of the state's payments consisted of old coins<sup>55</sup>, recycled within the provinces through the procurator's offices, so the weight of new coins to be transported

---

<sup>48</sup> Howgego, 1990: 21-25.

<sup>49</sup> Kemmers, 2006: 147-148; Heinrichs, 2000: 156-157.

<sup>50</sup> Duncan-Jones, 1994: 176.

<sup>51</sup> Speidel, 2009: 349-350.

<sup>52</sup> Kemmers, 2006: 146, 192; Wolters, 2000-2001: 581; Campbell, 1994: 23-24.

<sup>53</sup> Van Heesch, 2011: 321; Speidel, 2009: 360, 364; Van Heesch, 2007: 79-80.

<sup>54</sup> Wolters, 2000-2001: 581.

<sup>55</sup> Noreña, 2011: 194, summing up older literature in note 17.

from the mint and the strain on bullion supply was limited<sup>56</sup>. Also, coin transports would never have been a problem for the army<sup>57</sup>. The army (and the state post, the *cursus publicus*) had unparalleled logistic skills and resources.

In our opinion, this shows that in the area under review, new bronze coins entered coin circulation of the area under review through the army, paying the soldiers part of their *stipendium* in bronze coins. This has been suggested before<sup>58</sup>.

As we have eliminated the *nummularii* from the circulation schemes in the provinces under review, we can be quite sure of the bronze component in the soldier's pay between AD 69 and 197 in the northwestern provinces. In the latter year, army pay was doubled from 300 to 600 denarii and the silver content of the coins decreased dramatically. After AD 197 the *stipendia* lost their bronze component<sup>59</sup>.

Up to now we have only discussed the left half of the circulation triangle of figure 1: the way bronze coins were distributed. Eliminating this specific triangle from the coin circulation scheme by eliminating the *nummularii* creates problems in the right part of the now rejected triangle: how could bronze-receiving civilians obtain the denarii which they would need to pay taxes?

### Bronze coins and the levying of taxes

Before we try to reconstruct in which way taxes could have been levied in the area under review, we give a sort outline of the Roman tax system.

The Roman Empire levied so called 'direct taxes' (*tributa*) on the basis of a *census* or tax list. The most important tax yield came from the *tributum soli* (land tax). Another 'direct tax' was the *tributum capitis* or poll tax. So-called 'indirect taxes' (*vectigal*) were not raised on the basis of a tax list, but were 'occasional', for instance the inheritance tax, the tax on selling products, the tax on the manumission or sale of a slave, etc. Also, *portoria* (custom duties) and local taxes were raised<sup>60</sup>. Provincial *fisci* balanced their yearly account with the central treasuries in Rome.

The terminology, principles and even tariffs of the 'direct taxes' are uncomplicated, but the method of levying these taxes in Gallia Belgica and the two Germaniae is still under discussion<sup>61</sup>.

---

<sup>56</sup> Kemmers, 2006: 195.

<sup>57</sup> Van Heesch, 2014: 151; Harl, 1996: 226.

<sup>58</sup> Wigg-Wolf, 2014: 175-178; Van Heesch, 2009: 136-137; Kemmers, 2009a: 144-145; Van Heesch, 2007: 91-93; Van Heesch, 2000: 164.

<sup>59</sup> Kemmers, 2009a: 147-149.

<sup>60</sup> Günter, 2016 for a more detailed outline.

<sup>61</sup> France, 2001: 378.

We outline some tax levying options regarding three groups in the reviewed area: first of all agricultural *civitates*, then members of the business class and finally craftsmen and small tradespeople like shopkeepers, pub owners etc.

To start off with the *civitates*: the Batavians in the Lower Rhine area were exempt from taxation, because they were obliged by contract to supply recruits for the auxiliary troops<sup>62</sup>. This contract might have been changed after the Batavian revolt of AD 69-70. The Cananefates in the North Sea coastal area between Helinium and Rhine probably benefited from the same exemption. This taxation in manpower of both tribes could have been (partly) replaced by regular taxation shortly after the revolt or later. After AD 69-70 the Batavians probably paid land tax in kind, we can assume in part in money.<sup>63</sup> Recently, a surplus production was demonstrated in the Lower Rhine delta between AD 40 and 140, sufficient to provision the Roman army units stationed in the area with wood and some cereals, e.g. emmer and barley.<sup>64</sup>

Many other tribes in the Rhine area and Gallia Belgica paid direct taxes in manpower, at least until the Flavian period and probably later. The level of recruitment of the Batavians was not reached anywhere else. When a tribe could raise more recruits, the taxation in kind could be reduced. *Civitates* with a strong pastoral component were most likely taxed in pastoral products (Cananefates, Frisiavones, Menapii, Cugerni), while the Tungri, Nervii and Treviri probably were taxed in cereals<sup>65</sup>.

Taxation in kind was often preferred in low-yield, marginal, undermonetized, tax importing areas. Levying taxes in manpower or in kind allowed the central government to get revenues even in these areas, with relatively little trouble<sup>66</sup>.

However, from the end of the first century AD on, a business class<sup>67</sup> began to emerge in this rather marginal area. Its members were engaged in market transactions in order to obtain profits. Their presence is attested by second- and early third-century votive and funerary inscriptions. For instance, wealthy merchants in pottery, wine and glass in the Rhineland and in salt, wool, textiles and preserved fish and meat products in parts of Gallia Belgica exported their products via the Scheldt port near Domburg/Colijnsplaat and some of them dedicated votive altars to the local deity Nehalennia in the temple near this harbour. A number of these altars mention the dedicant's business, the professions of other dedicants can be inferred. As these producers and merchants would have been paid in gold and silver coins in view of the volume and value of their supplies,

---

<sup>62</sup> Roymans, 1996: 86.

<sup>63</sup> Aarts, 2015: 222-224.

<sup>64</sup> Van Dinter *et al.*, 2014: 31-32.

<sup>65</sup> Roymans, 1996: 86-87, compare Duncan-Jones, 1990: 187-189, 191.

<sup>66</sup> Hopkins, 2002: 217.

<sup>67</sup> Verboven, 2007.

paying *portaria*, poll tax, sales taxes and other taxes in silver would not have been a problem<sup>68</sup>. The same would have applied to the wealthy *villa* owners in the löss area in Belgium, the southern Netherlands and the hinterland of Cologne.

The central question in this paragraph however is: how were the small craftsmen, shopkeepers and pub owners taxed, who worked predominantly to the benefit of the army in the *vici* of the *castella* and the *canabae* of *castra*, and who were chiefly paid in bronze coins?

For a speculative hypothetical reconstruction of the taxation in coins in our area of research we have to explore the situation in Egypt. Taxation in Egypt is relatively well known, as papyri provide detailed information. The traditional opinion that the fiscal system of Roman Egypt was quite different from the tax arrangements in other provinces<sup>69</sup> is, as a result of more recent research, beginning to give way to the view that Egypt was, as far as taxation is concerned, a normal case in the Empire<sup>70</sup>.

In Egypt, poll tax was as a rule levied in *drachmae*, silver coins. The tax could also be paid in bronze coins (*oboles*) at a surcharge<sup>71</sup>. Some other taxes were levied in mixed currency, involving both *drachmae* and *oboles*, resulting for instance in a tax due of one *drachma*, three *oboles*. Sometimes taxes could be paid in rates, also involving payments partly in bronze coins<sup>72</sup>. Minor taxes like the *halike* or salt tax were levied entirely in bronze coins: four obols per annum<sup>73</sup>.

Long after our reviewed period, in ca. AD 360, the *aurum tironicum* (a tax in lieu of raising recruits) was paid in very small denominations, as the dossier of Papnouthis and Dorotheos, involved in the levying of taxes in Oxyrhynchos shows<sup>74</sup>. The two brothers though had to remit the total raised sum in gold to the treasury.

Since Roman Egypt was a 'normal' province for as far as taxation is concerned, we can presume that in Gallia Belgica and the two Germaniae taxes which could not be levied in manpower and in kind, for instance poll tax, might have been paid in bronze coins by those who were paid in this currency: the small craftsmen, shopkeepers, pub owners etc. mentioned before, and possibly by individual members of the northwestern *civitates* farming on a subsistence level, if they were subject to poll tax. As the reviewed provinces were not exporting taxes<sup>75</sup>, the bronze coins levied as taxes would have gone no further than the

---

<sup>68</sup> Kropff, 2016.

<sup>69</sup> Arguments summarized and in part refuted by Rathbone, 1993: 81.

<sup>70</sup> *Ibidem*: 111-112; Günther, 2016: 4.

<sup>71</sup> Harl, 1996: 231-238.

<sup>72</sup> Monson, 2014: 151-157.

<sup>73</sup> Rathbone, 1993: 90-91.

<sup>74</sup> De Ligt, 2009: 86-87.

<sup>75</sup> Cf. Hopkins, 1980.

procurator's offices in Trier and could be recirculated as part of the *stipendia*. This would have reduced the need for the supply of new bronze coins<sup>76</sup>.

The Roman tax system was rigid for as far as tax categories and tariffs are concerned, but the actual levying of taxes would have been pragmatic, especially in the economically marginal zones.

The absence of *nummularii* in the area under review would not have hampered taxation in any way.

## Conclusions

In the traditional model of coin circulation, Roman soldiers were paid in *denarii*, part of which they could exchange at *nummularii* (money changers) for bronze coins to facilitate small payments in *vicus* or *canabae*. Civilians paid taxes in *denarii*, so they also needed *nummularii* to exchange their bronze coinage for silver.

In this review of inscriptions, literary sources and coin circulation as mirrored in hoards and site finds in the provinces of Gallia Belgica, Germania Superior and Germania Inferior between AD 69 and 197, we have shown that the *nummularii* probably did not play a pivotal role in currency exchange transactions in this part of the northwestern Roman Empire.

We propose a different model of coin circulation for this area. Soldiers received bronze coins as part of their pay directly from the army paymasters, an option which was proposed in some of the recent literature and now can be confirmed.

However, since *nummularii* would not have played an intermediary role in the levying of taxes by providing the required silver coins to civilians either, we also need to review the tax cycle in the area. Were taxes as a rule actually paid in silver?

In military zones and the direct hinterland, Roman authorities favoured levying taxes first and foremost in manpower and in kind as the army needed recruits and supplies. This would indeed have applied to the three reviewed provinces, which were under the authority of the procurator in Trier, who was accountable for army pay and taxes.

However, some taxes (poll tax, inheritance tax etc.) would have been levied in money. Paying certain taxes in bronze coins was always an option in Egypt and recent research has shown that Egypt was fiscally not the exceptional province it was thought to be.

In the area under review, taxes in money probably were paid in silver coins by those taxpayers who were paid in silver themselves (wealthy manufacturers, merchants, ship owners etc.) while those who were primarily paid in bronze coins (small craftsmen, shopkeepers, pub owners etc.) could probably have met

---

<sup>76</sup> Kemmers, 2006: 243.

their tax obligations also in bronze. These bronze coins were probably recycled within the provinces through the procurator's offices, to be reused as part of the *stipendia*.

We illustrate our proposed circulation-model with a flow chart (figure 3).

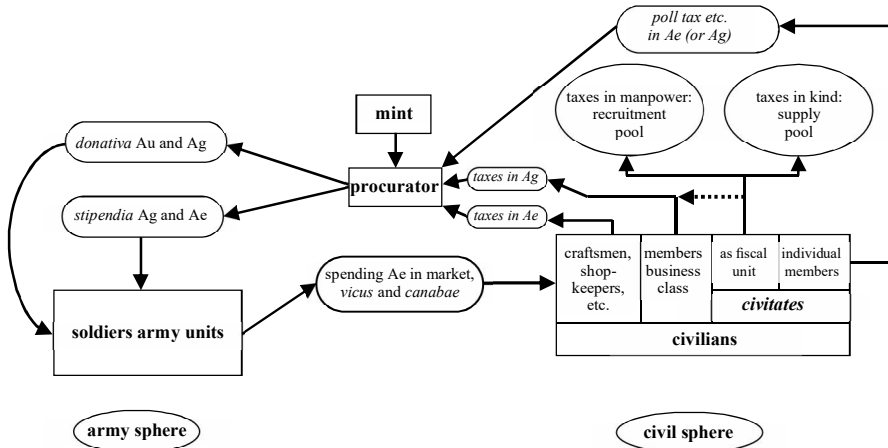


Fig. 3. Basic model of coin circulation in the two Germaniae and Gallia Belgica, AD 69-197

The flowchart is not all-embracing, as it centres on the circulation and recycling of bronze coins. Some movements of silver and gold coins are not included. For instance, periodically the procurator would have provided payments to *civitates* or groups of civilians in the form of *congiaria* (handouts), as payments for public buildings and civil servants or as loans.

Also, we focus on the Roman soldiers, as they circulated the bronze coinage. The army itself would have bought supplies from local *civitates* and members of the business class, to supplement the taxes paid in kind. For instance, the legion in Neuss bought salt from the Morini and the Menapii, as is epigraphically attested<sup>77</sup>.

These coin transfers were not included in the flowchart as they would obscure the view on our central research question: how did bronze coins move from mint to market?

In conclusion: Roman monetary policy shows a greater degree of flexibility and a higher level of sophistication than has been assumed.

<sup>77</sup> De Clercq & Van Dierendonck, 2008: 22; CIL 11: 390-391.

## Biographical note

Antony Kropff studied classical archaeology and antique numismatics in Leiden. He has published a series of articles on the 3<sup>rd</sup>-century currency circulation in journals such as *JMP*, *RBN* and *EJA*. He has also published on *Forum Hadriani*, on the Rhine Limes in the west of the country, and on the role of Roman trans-shipment ports.

## References

- Aarts, J. (2015) Marginal Money. The circulation of Roman Money in the rural world of the Meuse-Demer-Scheldt area, in: N. Roymans, T. Derks & H. Hiddink (eds.), *The Roman Villa of Hoogeloon and the Archaeology of the Periphery*, Amsterdam Archaeological Studies 22, 207-228 (Amsterdam)
- Andreau, J. (1987) *La vie financière dans le monde romain. Les métiers de manieurs d'argent (IVe siècle av. J.-C. - IIIe siècle ap. J.-C.)* (Rome)
- Andreau, J. (1999) *Banking and Business in the Roman World* (Cambridge)
- Bechert, T. & W.J.H. Willems (1995) *De Romeinse rijksgrens tussen Moezel en Noordzeekust* (Utrecht)
- Butcher, K. & M. Pointing (2012) The Beginning of the End? The Denarius in the Second Century *NC* 172, 63-83
- Carradice, I.A. & T.V. Buttrey (2007) *Roman Imperial Coinage Vol. II, part 1, Vespasian to Domitian, revised edition* (London)
- Campbell, J.B. (1994) *The Roman army 31 BC-AD 337: A sourcebook* (London)
- Crawford, M. (1970) Money and Exchange in the Roman World *Journal of Roman Studies* 60, 40-48
- De Clerq, W. & R. Van Dierenendonck (2008) Extrema Galliarum. Zeeland en Noordwest-Vlaanderen in het Imperium Romanum *Zeeuws Tijdschrift* 58: 3-4, 5-34
- De Ligt, L. (2009) From the taxpayer to the Roman treasury: three case studies *RBN CLV*, 81-90
- Duncan-Jones, R.P. (1990) *Structure and Scale in the Roman Economy* (Cambridge)
- Duncan-Jones, R.P. (1994) *Money and Government in the Roman Empire* (Cambridge)
- Elkins, N.T. (2009) Coins, contexts, and an iconographic approach for the 21<sup>st</sup> century, in: H.-M. von Kaenel & F. Kemmers (eds.) *Coins in Context I, New perspectives for the interpretation of coin finds* *Studien zu Fundmünzen der Antike* 23, 25-46 (Mainz)

- Elkins, N.T. (2017) *The Image of Political Power in the Reign of Nerva, AD 96-98* (Oxford-New York)
- France, J. (2001) Remarques sur les *tributa* dans les provinces nord-occidentales du Haut Empire romain (Bretagne, Gaules, Germanies) *Latomus* T. 60, Fasc. 2, 359-379
- Günther, S. (2016) Taxation in the Greco-Roman World: The Roman Principate <http://dx.doi.org/10.1093/oxfordhb/9780199935390.013.38> (29 April 2018)
- Harl, K.W. (1996) *Roman Economy, 300 B.C. to A.D. 700* (Baltimore-London)
- Heinrichs, J. (2000) Überlegungen zur Versorgung Augusteischer Truppen mit Münzgeld, ein neues Modell und daraus ableitbare Indizien für einen Wandel in der Konzeption des Germanenkriegs nach Drusus, in: L. Mooren (ed.) *Politics, Administration and Society in the Hellenistic and Roman World* *Studia Hellenistica* 36, 155-214 (Leuven)
- Hobley, A.S. (1998) *An Examination of Roman Bronze Coin Distribution in the Western Empire A.D. 81-192* British Archaeological Reports International Series 688 (Oxford)
- Hopkins, K. (1980) Taxes and Trade in the Roman Empire (200 B.C. - A.D. 400) *JRS* LXX, 101-125
- Hopkins, K. (2002) Rome, Taxes, Rents and Trade, in: W. Scheidel & S. von Reden (eds.) *The Ancient Economy*, 190-222 (New York)
- Howgego, C. (1990) Why did Ancient States strike Coins? *NC* 150, 1-25
- Howgego, C. (1994) Coin circulation and the integration of the Roman economy *Journal of Roman Archaeology* 7, 5-21
- Howgego, C. (2014) Questions of Coin Circulation in the Roman Period, in: K. Dörtlük, O. Tekin & R. Boyraz Seyhan (eds.) with M. Wilson (English ed.) *Proceedings of the First International Congress of the Anatolian Monetary History and Numismatics*, 307-317 (Istanbul)
- Kemmers, F. (2003) Quadrantes from Nijmegen: small change in a frontier province *Schweizerische numismatische Rundschau* 82, 17-35
- Kemmers, F. (2006) *Coins for a Legion. An Analysis of the coin finds from Augustan legionary fortress and Flavian canabae legionis at Nijmegen* Studien zu Fundmünzen der Antike 21 (Mainz)
- Kemmers, F. (2009a) From Bronze to Silver: Coin Circulation in the early third century A.D. *RBN* CLV, 143-158
- Kemmers, F. (2009b) Sender or Receiver? Contexts of Coin supply and Coin use, in: H.-M. von Kaenel & F. Kemmers (eds.) *Coins in Context I, New perspectives for the interpretation of coin finds* Studien zu Fundmünzen der Antike 23, 137-156 (Mainz)
- Kemmers, F. (2014) Buying loyalty: targeted iconography and the distribution of cash to the legions, in: M. Reddé (ed.) *De l'or pour les braves ! Soldes, armées et circulation monétaire dans le monde romain* *Scripta Antiqua* 69, 229-241 (Bordeaux-Paris)
- King, C.E. (1975) Quadrantes from the river Tiber *NC*<sup>7</sup> 15, 56-90
- Kropff, A. (2010) Forum Hadriani. Een geslaagde 'mislukte' stad *Westerheem* 59, 220-227



- Kropff, A. (2016) New English translation of the Price Edict of Diocletianus [www.academia.edu/23644199/New\\_English\\_translation\\_of\\_the\\_Price\\_Edict\\_of\\_Diocletianus](http://www.academia.edu/23644199/New_English_translation_of_the_Price_Edict_of_Diocletianus) (21 April 2018)
- Macro, A.D. (1976) Imperial Provisions for Pergamum: OGIS 484 *Greek, Roman and Byzantine Studies* 17, no. 2, 169-179
- McIntosh, F. & S. Moorhead, (2012) Roman *quadrantes* found in Britain, in light of recent discoveries recorded with the Portable Antiquities Scheme *British Numismatic Journal* 82, 223-230
- Monson, A. (2014) Late Ptolemaic Capitation Taxes and the Poll Tax in Roman Egypt *Bulletin of the American Society of Papyrologists* 51, 127-160
- Noreña, C.F. (2011) *Imperial Ideals in The Roman West, Representation, Circulation, Power* (Cambridge)
- Peter, M. (2001) *Untersuchungen zu den Fundmünzen aus Augst und Kaiseraugst Studien zu Fundmünzen der Antike* 17 (Mainz)
- Rathbone, D. (1993) Egypt, Augustus and Roman taxation, *Cahiers du Centre Gustave Glotz* 4, 81-112
- Reece, R. (1973) Roman coinage in Britain and the Western Empire, *Britannia* 4, 227-251
- Roymans, N.G.A.M. (1996) The sword or the plough. Regional dynamics in the Romanization of Belgic Gaul and the Rhineland area, in: N.G.A.M. Roymans (ed.) *From the Sword to the Plough. Three studies on the earliest Romanization of Northern Gaul*, 9-126 (Amsterdam)
- Roymans, N.G.A.M. (2008) *Muntgebruik in een dynamisch grensgebied. Keltische munten in de Nederrijnse regio* (Utrecht)
- Rüfner, T. (2016) Money in the Roman Law texts, in: D. Fox & W. Ernst (eds.), *Money in the Western Legal Tradition*, 93-109 (Oxford)
- Scheidel, W. (2010) Coin quality, coin quantity and coin value in Early China and the Roman World, *American Journal of Numismatics* 22, 93-118
- Scheidel, W. (2008) The monetary systems of the Han and Roman Empires (Princeton/Stanford Working Papers in Classics) <https://www.princeton.edu/~pswpc/pdfs/scheidel/o20803.pdf> (29 April 2017)
- Speidel, M.A. (2009) *Heer und Herrschaft im Römischen Reich der Hohen Kaiserzeit* (Stuttgart)
- Strobel, K. (2002) Geldwesen und Währungsgeschichte des Imperium Romanum im Spiegel der Entwicklung des 3. Jahrhunderts n. Chr. – Wirtschaftsgeschichte im Widerstreit von Metallismus und Nominalismus, in: K. Strobel (ed.) *Die Ökonomie des Imperium Romanum: Strukturen, Modelle und Wertungen im Spannungsfeld von Modernismus und Neoprimitivismus*, 86-168 (St Katharinen)
- Stuart P. & J.E. Bogaers (2001) *Nehalennia. Römische Steindenkmäler aus der Oosterschelde bei Colijnsplaat* (Leiden)
- Van Dinter, M., L.I. Kooistra, M.K. Dütting, P. van Rijn & C. Cavallo (2014) Could the local population of the Lower Rhine delta supply the Roman Army, part 2: Modelling

- the carrying capacity using archaeological, paleo-ecological and geomorphological data *Journal of Archaeology in the Low Countries* Vol. 5, no. 1, 5-50 <http://jalc.nl/cgi/t/text/get-pdf75d9.pdf?c=jalc;idno=0501a04> (29 April 2018)
- van Heesch, J. (2000) Some considerations on the circulation of Augustan and Tiberian bronze coins in Gaul, in: R. Wiegels (ed.) *Die Fundmünzen von Kalkriese und die frühkaiserzeitliche Münzprägung* Osnabrücker Forschungen zu Altertum und Antike-Rezeption 3, 153-170 (Möhnesee)
- van Heesch, J. (2007) Some Aspects of Wage Payment and Coinage in Ancient Rome, First to Third Centuries CE, in: J. Lucassen (ed.) *Wages and Currency: Global and Historical Comparisons*, 77-96 (Bern-Berlin)
- van Heesch, J. (2009) Providing markets with small change in the early Roman Empire: Italy and Gaul, *RBN CLV*, 125-142
- van Heesch, J. (2011) Quantifying Roman Imperial coinage, in: F. de Callatay (ed.) *Quantifying monetary supplies in Greco-Roman Times* Pragmateiai 19, 311-328 (Bari)
- van Heesch, J. (2014) Paying the Roman Soldiers in the East (1<sup>st</sup>-2<sup>nd</sup> century A.D.) in: M. Reddé (ed.) *De l'or pour les braves ! Soldes, armées et circulation monétaire dans le monde romain* Scripta Antiqua 69, 139-159 (Bordeaux-Paris)
- Verboven, K. (2007) Demise and fall of the Augustan Monetary System, in: H. Olivier, G. de Kleijn & D. Slootjes (eds.) *Crisis and the Roman Empire*, 245-257 (Leiden-Boston)
- Verboven, K. (2007) Good for Business. The Roman Army and the Emergence of a 'Business Class' in the Northwestern Provinces of the Roman Empire (1<sup>st</sup> century BCE - 3<sup>rd</sup> century CE), in: L. de Blois & E. Lo Cascio (eds.) *The Impact of the Roman Army (200 BC - AD 476): Economic, Social, Political, Religious and Cultural Aspects*, Impact of Empire 6, 295-314 (Leiden-Boston)
- Walker, D.R. (1988) The Roman Coins, in: B. Cunliffe (ed.) *The Temple of Sulis Minerva at Bath*, 281-358 (Oxford)
- Wigg, D.G. (1995) Coin supply and the Roman Army, in: W. Groenman-van Waateringe, B.L. van Beek, W.J.H. Willems & S.L. Wynia (eds.) *Roman Frontier Studies 1995*, 281-288 (Oxford)
- Wigg-Wolf, D.G. (2014) Coin supply and the Roman army revisited: coin finds and military finance in the late-first and second centuries AD, in: M. Reddé (ed.) *De l'or pour les braves ! Soldes, armées et circulation monétaire dans le monde romain*, Scripta Antiqua 69, 161-179 (Bordeaux-Paris)
- Willems, W.J.H. (1984) Romans and Batavians. A regional Study in the Dutch Eastern River Area, II *Berichten ROB* 34, 39-331
- Wolters, R. (1999) *Nummi Signati: Untersuchungen zur römischen Münzprägung und Geldwirtschaft* (Munich)
- Wolters, R. (2000-2001) Bronze, Silver or Gold? Coin finds and the pay of the Roman army *Zephyrus* 53-54, 579-588
- Wolters, R. (2006) Geldverkehr, Geldtransporte und Gelddbuchungen in römischer Republik und Kaiserzeit: das Zeugnis der schriftlichen Quellen, *RBN CLII*, 23-49