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CHANGING CONTENT

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Changing Content

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Abstract: In recent years, the digital registration of the Teylers Museum's numismatic collection has been seriously overhauled. A lot of information has been added to the objects, and most of the collection has been subjected to a metal analysis. This text focuses on the added value, as a first step to make the data FAIR.

Keywords: Registration; Metal analysis; Coins medals; FAIR data; Counterfeits.

Introduction

As a curator, I am responsible for two numismatic collections in the Netherlands. The first is that of the Teylers Museum in Haarlem and the second of the Rijksmuseum in Amsterdam. In total, I work with more than 40,000 objects, of which a small group is Roman and Byzantine. In recent years, digital registration in the Teylers Museum has undergone a major overhaul. A lot of information has been added to the objects as a first step to make the data FAIR (findable, accessible, interoperable and reusable). Most of the collection has also been subjected to metal analysis. This text demonstrates the added value of these exercises.

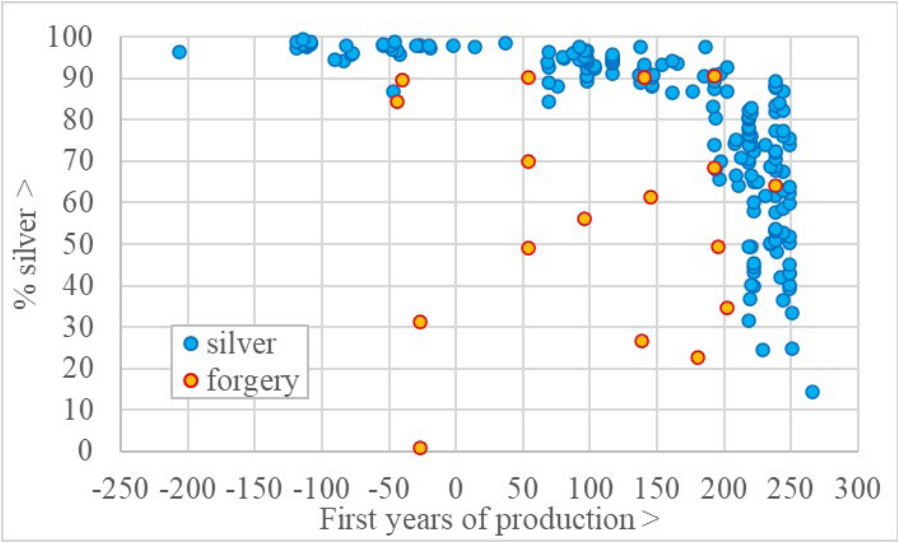
Focus

The majority of both collections were described in the 19th Century. These 19th-century descriptions formed the starting point for the digital collection registrations around the year 2000. In the nearly 150 years since the original descriptions were made, much new research has been published, but little or no information has been added to these databases. This may be 'charming' to people researching the history of museums, but it is not very useful for numismatic research. In the past couple of years, improvements have been made to the descriptions. The 19th-century inventory cards — with the original descriptions — were also digitised. Furthermore, a parallel database is being created with the names of the people and institutions involved. To date, over 7,500 names have been collected.

In this text, I focus on the Roman and Byzantine coins. The original status quo of the descriptions is that the coins in the Teylers Museum are described with the publications of Cohen (1880)

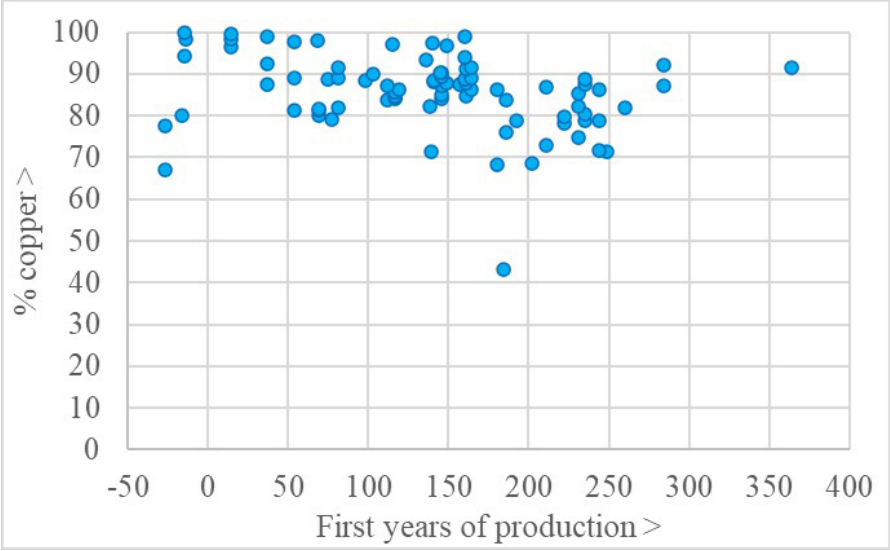
and Sabatier (1862), and that those of the Rijksmuseum are only described roughly and without literature, like 'a "middle bronze" coin from Emperor August.' The Teylers Museum has two old collections dating back to the 18th century. The first is from the museum's founder, Pieter Teyler van der Hulst (1702–1778), with 59 coins (18 Republic, 41 Empire). The second is from the Haarlem printer Johannes Enschedé (1750–1799), with 569 coins (7 Republic, 310 Empire, 21 Eastern Empire, and 231 Byzantine). In addition, the museum has 192 coins (4 Republic, 177 Empire, 2 Eastern Empire and 9 Byzantine) in its collection, so a total of 820 coins from these periods. The Rijksmuseum has a much smaller collection — brought together in the 19th century by the Royal Society of Antiquities — with 18 coins (2 Republic, 13 Empire, 3 Byzantine).

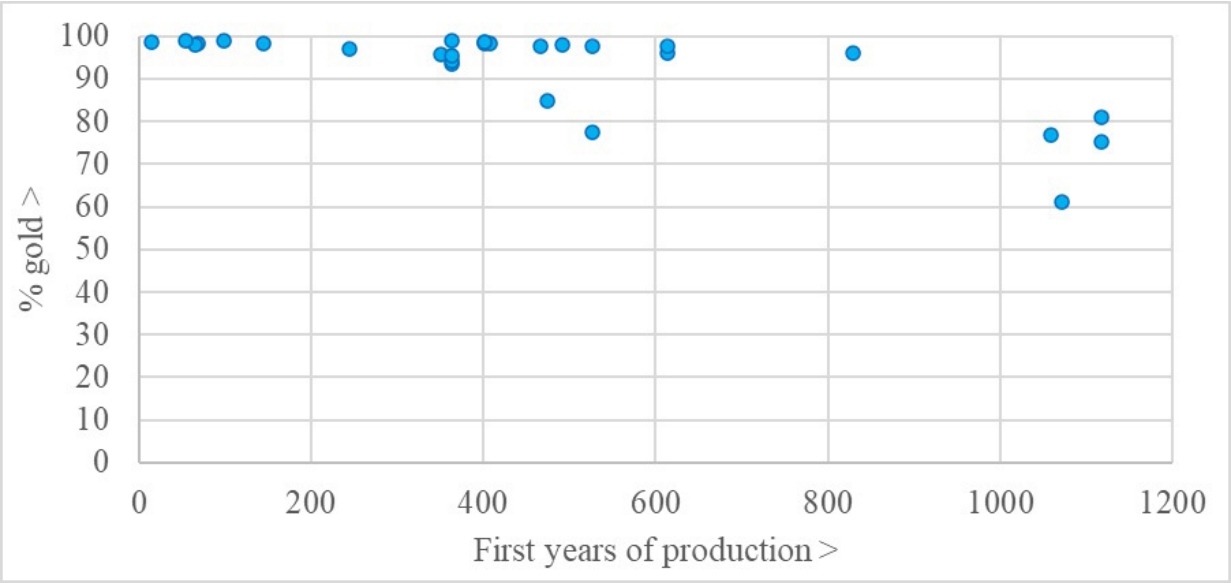
The fact that the coins come from 'old' collections does not mean that they are genuine. Several counterfeits have been discovered. To support the research, the metal content of 300 out of the 820 coins in the Teylers Museum was examined: 28 gold, 187 silver, and 85 copper and copper-based coins. The most important data is given in **Graphs 1–3**.



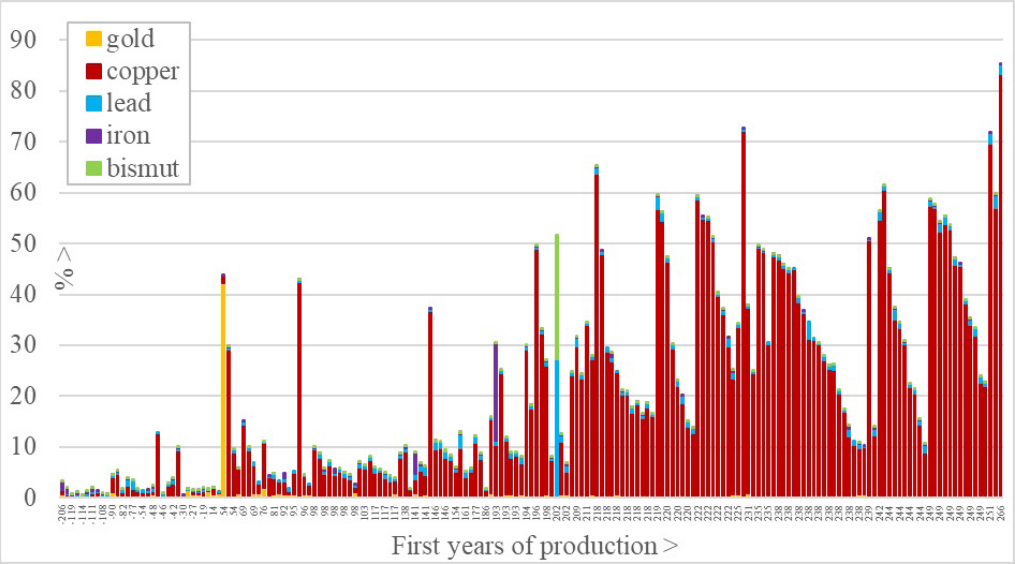
Graph 1. Gold (Au) content in gold coins.

Graph 2. Silver (Ag) content in denarii & antoniniani.





Graph 3. Copper (Cu) content in coins of copper, brass, billion, and orichalcum.



Graph 4. Non-silver elements in silver coinsi.

Data

I am very happy with the data collected, but it also multiplies my problem, as that data is only useful if the objects have proper descriptions and, of course, the separation between real coins and counterfeits. **Graphs 1, 2,** and **3** show several deviations — coins with a primary metal content that is lower than expected. This is especially the case with the silver denarii and antoniniani. Of the gold coins (**Graph 1**), the piece with the lowest amount of gold (61%) is a histamenon (**Fig. 1**) from the Byzantine Empire, minted during the reign of Emperor Michael VII (1071–1078). This piece looks real. Graph 2 shows the silver coins. In the past, some easily recognisable forgeries were already identified, like Figure 3, with a genuine coin depicted in **Fig. 2**. This amount is growing thanks to metallurgical research. Up to now, 16 counterfeits have been discovered, several of which are depicted in this text (**Fig. 3–12**). In Graph 2, most of these coins are related to the dots in the period of 50 BCE–200 CE, with a silver content of less than 80%. Graph 3, with 'copper' coins, shows one object that appears genuine, even though it contains 49% lead (**Fig. 13**).

The added elements in silver coins change over time, as can be seen in Graph 4. This mainly concerns a growing amount of copper, as would be expected with debasement. The oldest phase, up to about 54 CE, shows coins with a high silver content. And at the end of the 2nd century, the period of inflation and the introduction of the antoniniani is clearly visible. Because the coins were sorted by silver content per year, Graph 4 shows a sawtooth-shape as soon as more coins were measured in one year.

Two remarkable coins — one from the year 54 and one from 202 — show a completely different metal content. The first (**Fig. 5**) is a forgery with 42% gold. It shows an old layer of gilding. Someone may have tried to 'upgrade' this denarius to a gold aureus. Maybe the technique of fire-gilding is used, as a significant amount of mercury has been detected. The second coin with a remarkably low silver content is a denarius from Plautilla (**Fig. 12**). Given the uneven surface and the uneven rim with a possible residue of the casting technique under the portrait, this specimen should also be considered a forgery. Four other denarii stand out: one of Faustina I, one of Septimius Severus, and two of the Roman Republic. The first two have a significantly higher iron content (**Fig. 9** and **11**), while the last two (**Fig. 4** and **14**) contain approximately 10% copper. Of these four, the Caesar denarius (Figure 14) is likely to be genuine. This shows that a variation in metal content provides a clue but is not always the key factor in labelling a coin as a forgery.

To conclude

In the coming period, the databases will be further enhanced, and the issue of later copies will be tackled more thoroughly. Several steps are needed to make the coins of both museums FAIR. The Teylers Museum is working on a new website where objects are given persistent identifiers. This step has already been taken at the Rijksmuseum, but the object descriptions are still too rudimentary. With additional provenance research, maybe some objects can be linked to coin finds and old collections. Once the data is standardised and cleaned, the coins are ready to be linked to the Nomisma standards and to other datasets, such as OCRE. With only 820 coins, this is a small step for the numismatic community, but a big step for both museums, as it can be used as a blueprint to connect other parts of the numismatic collections in the near future.

Fig. 1. Byzantine Empire, Michael VII (1071–1078), histamenon. Gold, 29 mm, 4.3017 grams, 61.04% gold, 34.27% silver, 3.98% copper, 0.71% remainder (inv. TMNK 09862).

Fig. 2. Roman Empire, August (27 BCE – 14 CE), denarius. 18 BCE, silver, 20 mm, 3.8266 grams, 0.61% gold, 97.95% silver, 0.60% copper, 0.84% remainder (inv. TMNK 12846).

Fig. 3. Roman Empire, August (27 BCE – 14 CE), denarius. 18 BCE, silver, 17 mm, 3.1917 grams, surface: 94.02% silver, 4.61% copper, core: 31.25% silver, 67.17% copper (inv. TMNK 09301).

Fig. 4. Roman Republic, Octavian, travelling mint, denarius. 40 BCE, silver, 18 mm, 3.2836 grams, 0.37% gold, 89.59% silver, 8.96% copper, 0.48% lead, 0.60% remainder (inv. TMNK 09310).

Fig. 5. BRoman Empire, Nero (54–68 CE), denarius. 60–61 CE, gilded silver, 17 mm, 3.0487 grams, 42.21% gold, 49.17% silver, 1.48% copper, 5.95% mercury, 1.19% remainder (inv. TMNK 09326).

Fig. 6. Roman Empire, Nero (54–68 CE), denarius. 65–66 CE, silver plated copper, 18 mm, 2.3188 grams, core: 0.00% gold, 69.95% silver, 29.17% copper, 0.24% iron, 0.13% tungsten, 0.51% remainder (inv. TMNK 09329).

Fig. 7. Roman Empire, Nerva (96–98 CE), denarius. 97 CE, silver, 17 mm, 3.4536 grams, 0.00% gold, 56.25% silver, 42.36% copper, 0.48% lead, 0.12% tin, 0.07% iron, 0.47% tungsten, 0.25% remainder (inv. TMNK 09357).

Fig. 8. Roman Empire, Antoninus Pius (138–161 CE), denarius. 139 CE, silver plated copper, 17 mm, 2.2432 grams, 0.43 gold, 26.78 silver, 71.27 copper, 0.47% lead, 0.71% tin, 0.14 antimony, 0.91 remainder (inv. TMNK 09394).

Fig. 9. Roman Empire, Faustina I (141–161 CE), denarius. 141–161 CE, silver, 17 mm, 3.0067 grams, 0.90% gold, 90.17% silver, 2.75% copper, 0.96% lead, 4.21% iron, 0.37% tin, 0.64% remainder (inv. TMNK 09400).

Fig. 10. Roman Empire, Marcus Aurelius (161–180 CE), denarius [hybrid]. 180 CE, silver, 18 mm, 2.5356 grams, 0.00% gold, 22.82% silver, 68.19% copper, 6.13% lead, 0.63 iron, 1.44% tin, 0.79% remainder (inv. TMNK 09407).

Fig. 11. Roman Empire, Septimius Severus (193–211 CE), denarius. 193–211 CE, silver, 17 mm, 2.6377 grams, 0.47% gold, 68.57% silver, 9.82% copper, 0.99% lead, 19.23% iron, 0.56% tin, 0.36% remainder (inv. TMNK 09444).

Fig. 12. Roman Empire, Plautilla (202–211 CE), denarius. 202–211 CE, silver, 18 mm, 4.4198 grams, 0.00% gold, 34.63% silver, 0.12% copper, 13.13% tin, 27.16% lead, 24.52% bismuth, 0.44% remainder (inv. TMNK 09455).

Fig. 13. Roman Empire, Commodus (161–192 CE), sestertius. 186–189 CE, copper, 32 mm, 25.6669 grams, 43.20% copper, 49.31% lead, 5.34% tin, 1.53% iron, 0.62% remainder (inv. TMNK 09431).

Fig. 14. Roman Republic, Julius Caesar (unknown mint, Africa), denarius. 47–46 BCE, 18 mm, 3.9081 grams, 0.00% gold, 86.89% silver, 12.62% copper, 0.28% tin, 0.21% remainder (inv. TMNK 11947).

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