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## JULIO–CLAUDIAN *DENARII* AND *AUREI* IN CAMPANIA AND INDIA

The aim of this paper is to assess the impact of the India trade on the monetary circulation of central Italy and to highlight an aspect of the evolution of the Roman monetary mass during the crucial decades of the Julio–Claudian dynasty. The argument made here is that some peculiar features revealed by the Vesuvian numismatic evidence were a consequence of the export of coins connected to the India trade, and that the distribution of Roman coins found in India reflects the expansion of gold coinage in the Roman monetary system, especially from Tiberius on.

There is no need to emphasize the key role played by Puteoli in the commercial network that, in the western part of the Mediterranean, redistributed the commodities exported from Alexandria, especially after the Roman conquest of Egypt, or to highlight how many of these commodities were in turn imported from the Indian Ocean. Equally redundant would be a full survey of the evidence regarding the consumption of Indian commodities in Campania. A few short comments, however, on a couple of pieces of evidence may be relevant. Recovered from the excavations of two Pompeian houses, the *Casa delle nozze di Ercole* (VII 9, 4–7) and the *Casa delle Vestali* (VI 1, 6–8), were the recently identified remains of peppercorn<sup>1</sup>. Two peppercorns, found in a cesspit associated with the former building, have been dated to the 4<sup>th</sup>–2<sup>nd</sup> cent. BC. If this rather unexpected chronology were confirmed and corroborated by supporting evidence, it would necessitate the revision of current opinions on the significance of the

\* An earlier version of this paper was presented at the Workshop Internazionale di Numismatica. Roma, 28–30 September 2011.

<sup>1</sup> CIARALDI 2007, 102; 114–115; 125; 139.

commercial relations between South India and Mediterranean world in the Hellenistic age. Fourteen peppercorns, from the latter building, were found in layers dating to the mid to late 1<sup>st</sup> cent. BC, a chronology that is not at all surprising. These later dates are consistent with other literary and archaeological evidence showing approximately contemporaneous pepper consumption both in Rome<sup>2</sup> and in the Roman camp of Oberaden in Germany<sup>3</sup>. The latter chronology also coincides (or shortly precedes) the dates for the pepper containers and the silver pepper pots still in use in some Pompeii houses at the time of the eruption<sup>4</sup>. Moreover, this evidence of pepper consumption parallels other Vesuvian evidence that serves as eloquent testimony to the trade relations with the Indian Ocean littoral – the pearls and emeralds in so many Pompeian jewels<sup>5</sup>, the obsidian bowls from Stabiae<sup>6</sup>, and of course the famous Indian ivory statuette<sup>7</sup> – all too well-known to require review here.

Speaking of ivory artifacts, TPSulp 101 = TPN 102 may give an idea of the price they could command, if at l. 4 Giuseppe Camodeca's reading *ebur++* is correct<sup>8</sup>. The tablet poorly preserves a contract signed at Puteoli in August AD 48 by C. Sulpicius Faustus and Ti. Iulius Myrtilus, an imperial freedman. The agreement involves a

<sup>2</sup> The earliest occurrence of the word *piper* (a loanword: BIVILLE 1995, 248) is in Varro, *Men.* 581; then Hor., *sat.* II 4, 74; 8, 49; *epist.* I 14, 23; II 1, 270 and Vitruv. VIII 3, 13. The second book of the *Satires* was published around 30 BC; the first book of the *Epistles* around 20 BC; the Epistle to Augustus, which mentions the *vicus* where frankincense, aromas and pepper are sold, goes back to 11 BC (NISBET 2007, 12; 14–15; 18–20).

<sup>3</sup> KUČAN 1984; KUČAN 1992, 245–246. Other findings of peppercorns in Roman archaeological sites: VAN DER VEEN 2001 (Mons Claudianus); VAN DER VEEN 2004, 126; 2011, 41–46 (Myos Hormos); KREUTZ 1994/5, 70 (Hanau); KÜSTER 1995, 137–138 (Straubing); DRUMMOND–MURRAY 2002, 246, Table 126 (London); REDDÉ 2005, 255 (Oedenburg on the Rhine); CAPPERS 2006, 112–119 (Berenice, Shenshef, Qasr Ibrim). The example from Bath (DURRANI 2004, 105) has been rejected as a misidentification (COOL 2006: 64, nt. 47). Written evidence for trade and consumption of pepper: SCHWINDEN 1985 (Trier); Tab. Vindol. 184 (Vindolanda).

<sup>4</sup> CIL IV 5763; PAINTER 2001, 71–72.

<sup>5</sup> D'AMBROSIO 1987; SCATOZZA HÖRICH 1989; D'AMBROSIO–DE CAROLIS 1997.

<sup>6</sup> LEOSPO 1999, 333–342.

<sup>7</sup> DURING–CASPER 1981; BASU 2010.

<sup>8</sup> CAMODECA 1999, 213. I would not prefer *rubram* read by WOLF 2010, 141.

58-pound piece of ivory (ll. 5–6)<sup>9</sup>, whose value is calculated at a price per pound that Camodeca reads as 9 *denarii* (ll. 6–7: *denariis nou/[enis]*). However, judging from the pictures published by Camodeca<sup>10</sup>, I would not say that the reading *nou/[enis]* (9) is beyond doubt. Rather, I would consider a more likely reading to be *non/[genis]* (900), which, in my opinion, makes much better sense. As a matter of fact, while a reading *nou/[enis]* would compel us to disconnect the contract related to the *ebur++* (l. 4) from the sum of 200,000 (plus something?) sesterces mentioned at ll. 11–12 (*sestertia ducen/[ta ---] nummum*)<sup>11</sup>, a reading *non/[genis]* and a price of 900 *denarii* per pound is a better account for an item weighing 58 pounds and valued at no less than 200,000 sesterces:  $58 \times 900 = 52,200 \text{ denarii} = 208,800 \text{ sestertii}$ , close enough to the 200,000 (plus something?) sesterces mentioned in ll. 11–12.

Camodeca remarks that a price for ivory of 9 *denarii* per pound would be much lower than the 100 drachmas per mina (= 63 *sestertii* per pound), which is the price of the ‘sound’ ivory in the Muziris papyrus<sup>12</sup>. On the contrary, a price of 900 *denarii* per pound would be perhaps too high for raw ivory. After *ebur*, Camodeca tentatively suggests reading *am*, which seems to me likely. I would attach it to the preceding letters in order to obtain *eburam*. If *eburam* stands for *eboream*<sup>13</sup>, it clearly follows

<sup>9</sup> CAMODECA 1999, 213 suggests that *ebur++* was followed by an adjective specifying the quality of the ivory.

<sup>10</sup> The original “non è più identificabile”: CAMODECA 1999, 213.

<sup>11</sup> CAMODECA 1999, 214 suggests that, in addition to 2,088 sesterces of ivory, other more expensive items – possibly mentioned at ll. 8–9 – were purchased.

<sup>12</sup> CAMODECA 1999, 214, nt. 46. The ‘prices’ of the ‘Muziris’ papyrus are actually conventional fiscal values lower than the market prices in Alexandria and, even more so, than those in Puteoli: DE ROMANIS 2010/1.

<sup>13</sup> Omission of *e* in hiatus is common in Murecine tablets (*Putolanorum*: TPSulp 51, p. 3, l. 6; 52, p. 3, l. 7; *Putolis*: 51, p. 3, l. 8; 52, p. 3, l. 14; 68 p. 3, l. 10; *fator*: 52, p. 3, l. 13; *debo*: 52, p. 2, l. 10) and Pompeian graffiti (*Clodamos*: CIL IV 5158; *oli*: 4610; *olum*: 5185; *ordi*: 6722): ADAMS 1990, 233–234; VÄÄNÄNEN 1959, 40; VÄÄNÄNEN 2003, 98. For derivatives of *ebur* with the spelling *ebur-*, cfr. Gloss. III 202, 41 (*eburea*); de dub. nom., Keil V 578, 5 (*eburrea*); CIL VI 7885; 9397 (*eburarius*); in Plaut., *aul.* 168 (*eburata*); Stich. 377 (*eburatos*); H.A., Aur. 13, 3 (*eburatam*); 46, 3 ([*a*] *eburata*).

that the valuation was for a solid<sup>14</sup> ivory artifact of considerable proportions (weighing as much as 58 pounds = around 18.7 kg) and high value (more than 200,000 sesterces): presumably, a statue of a female figure much bigger than the famous Indian statuette from Pompeii<sup>15</sup>.

Being as exclusive as (or even more exclusive than) ivory<sup>16</sup> or as accessible as pepper<sup>17</sup>, Indian commodities could generate businesses of enormous magnitude under the Julio–Claudian emperors. How did their import and internal trade, dramatically increased in the last decades of the 1<sup>st</sup> century BC, affect the monetary circulation in the area of Puteoli?

#### a. *Vesuvian scarcities*

Recent and more extensive surveys have once again emphasized the scarcity of Julio–Claudian, pre–AD 64 *denarii* and *aurei* in the Vesuvian region. In particular, Julio–Claudian *denarii* represent only 4.7% of the 2,445 silver coins from Pompeii counted by Rosa Vitale<sup>18</sup>,

<sup>14</sup> Charis., gram. 93: *eboreum ratione dicimus [...] sed consuetudo etiam eboratum admisit et eburnum [...] quae ita placuit distingui ut eboreum sit ex solido ebore confectum, eboratum extrinsecus ebore ornatum, eburnum ad similitudinem eboris aptatum.*

<sup>15</sup> Cfr. Plin., n.h. VII 183: [...] *ante Apollinem eboreum, qui est in foro Augusti; XXXVI 40: Iouem fecit eboreum in Metelli aede, qua campus petitur.* Or, with the synonym *eburneus*, Cic., II Verr. IV 103: [...] *eburneae Victoriae antiquo opere ac summa arte perfectae.* The weight of 58 pounds and the remains of l. 5 preclude identification with an *eborea puxis* (CIL V 7877; X 6). For ivory statues of Caesar and Britannicus, cfr. Cass. Dio XLIII 45, 2; Suet., Tit. 2. Despite Charisius (nt. 14), Germanicus' *eburna effigies* (Tac., ann. II 83) was probably in solid ivory as well. A price of 900 *denarii* per pound may be compared with that of 5,000 sesterterii per pound for the most exquisite silverware: Martial, III 62, 4.

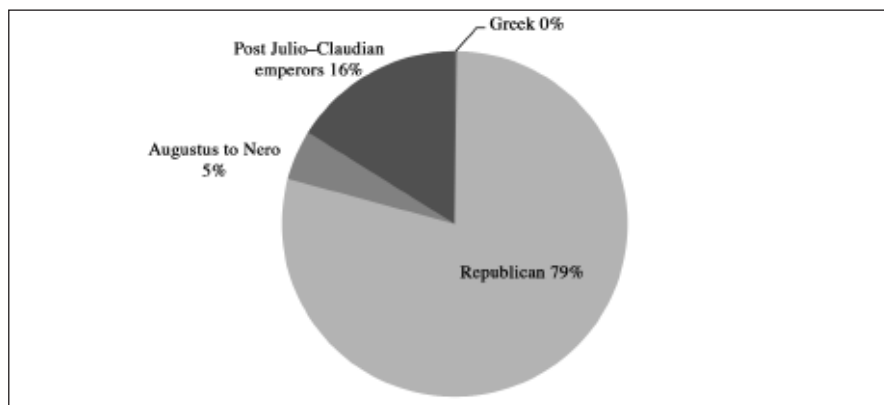
<sup>16</sup> Which however was not always equally highly priced in antiquity: CUTLER 1987, 431–437.

<sup>17</sup> Pliny gives a price of four *denarii* per pound: Plin., n.h. XII 28.

<sup>18</sup> VITALE 2007, 118 (tabella 3a). Previous statistics in LO CASCIO 1980, 454; 470 (out of 1,280 *denarii* from 14 Pompeian hoards, only 6.72% were issued from Augustus to Nero); out of 92 stray finds, only 2 belonged to the period from Augustus to Nero); and DUNCAN–JONES 2003, 167 (2,385 *denarii* from 21 Pompeian hoards, only 4.8% belonging to the period from Augustus to Nero). Statistics restricted to three single Pompeii's *regiones* in TALIERCIO MENSITIERI 2005, 112 (IX); CANTILENA 2008, 100–105 (VI); GIOVE 2013, 86–90 (I).

and pre-AD 64 *aurei* are just 9% of the 682 identified pieces from Pompeii, Herculaneum and Oplontis considered by Renata Cantilena<sup>19</sup>.

These data are all the more remarkable when contrasted with the plethora of republican *denarii*<sup>20</sup> and post AD 64 *aurei*, which must have comprised the largest share, in terms of face value, of the monetary mass in the Vesuvian area<sup>21</sup>.



1. Sample of silver coins from Pompeii (2,445) (data from VITALE 2007)

The uneven chronological distribution of Pompeian coins has been variously interpreted. Enrica Pozzi has surmised that the abundance of post-reform *aurei* reflects a strictly local economic expansion triggered by the reconstruction after the earthquake of AD 62<sup>22</sup>. Elio

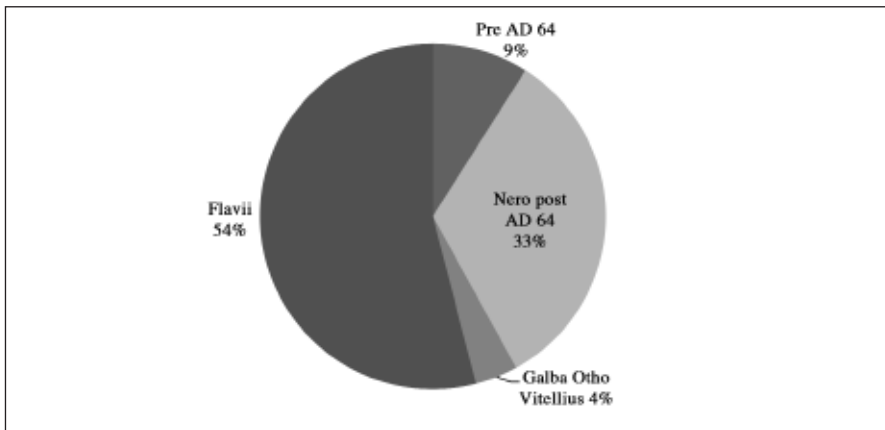
<sup>19</sup> CANTILENA 2007, 173 (Grafico 3); 174 n. 53. Out of 374 identified *aurei* from Pompeii, DUNCAN-JONES 2003, 164–171 counts only 7.7% belonging to the period from Augustus to Claudius. Again, statistics for Pompeii's *regiones* IX, VI, and I in TALIERCIO MENSITIERI 2005, 112; CANTILENA 2008, 97–99; GIOVE 2013, 84–86 respectively.

<sup>20</sup> 63.9% in the hoards and 72.82% in the stray finds considered by LO CASCIO 1980, 454; 470; 67.7% from the hoards considered by DUNCAN-JONES 2003, 167; 169 (6); 78.97% in sample by VITALE 2007, 118 (Tabella 3a).

<sup>21</sup> In DUNCAN-JONES' estimate (DUNCAN-JONES 2003, 166), the 766 *aurei* he counted from the urban area of Pompeii were equivalent to the 61% of the face value of all the coins found there. For the Boscoreale hoard, see below pp. 174–175. It is reasonable to assume that, if these data are anyway biased (ANDREAU 2008, 210–211), it is more likely they underrepresent the share of the gold coins rather than the reverse.

<sup>22</sup> POZZI 1958/9, 227.

Lo Cascio ascribed the scarcity of pre-reform coins to the corrosive action of the Gresham law: at Pompeii, as elsewhere in the empire, most of the pre-reform silver and gold coins would have been melted down or hoarded<sup>23</sup>. Contrasting Pompeian and provincial evidence, Richard Duncan-Jones suggested either a “severe constriction before AD 64 in the flow of precious-metal coin to Italy as compared with the western provinces”<sup>24</sup> or a recall of the pre-reform coins restricted at first to Italy and then later applied to the provinces<sup>25</sup>. With regard to the silver coinage, Rosa Vitale limited the discrepancy between the Vesuvian and provincial evidence to the issues of Augustus and Tiberius, emphasizing that the rarity of the silver coinage of Gaius, Claudius and Nero is a common feature in Pompeii and in the western provinces<sup>26</sup>. On the other hand, Renata Cantilena argues that the predominance of post-reform *aurei* was not peculiar to the Vesuvian area, but rather was a byproduct of a general increase in the scale of the emissions, also suggested by other hoards from different areas of the empire<sup>27</sup>.



2. *Aurei* from Pompeii and suburb, Herculaneum, Oplontis (682)  
(from CANTILENA 2007)

<sup>23</sup> LO CASCIO 1980, 455.

<sup>24</sup> DUNCAN-JONES 1994, 121.

<sup>25</sup> DUNCAN-JONES 2003, 170.

<sup>26</sup> VITALE 2007, 125–130.

<sup>27</sup> CANTILENA 2005, 675.

Of course, the structure of the monetary mass in the Vesuvian area would have resulted from an array of different causes; and each one of the hypotheses just mentioned may have contributed to the scenario under consideration here. However, one hypothesis that I believe should also be included in this discussion is the involvement of the Campanian merchants in the contemporary India trade<sup>28</sup>. I would like to offer the following proposal: that the striking scarcity of Julio–Claudian, pre–reform *denarii* and *aurei* in the Vesuvian area is in part related to the frequency of those same issues in Roman coin hoards in India or, more bluntly, that *denarii* and *aurei* found in India were in fact exported primarily from Italy. If we regard Roman coins found in India as, for the most part, a sort of secretion from central Italy’s coin circulation, then the marked dissimilarity emphasized by Richard Duncan–Jones<sup>29</sup> between the Italic (Campania) and provincial (Gaul and Germany) evidence is better understood as resulting from the economic dynamics of trade rather than centralized monetary policy.

#### b. *Denarii and aurei found in India*

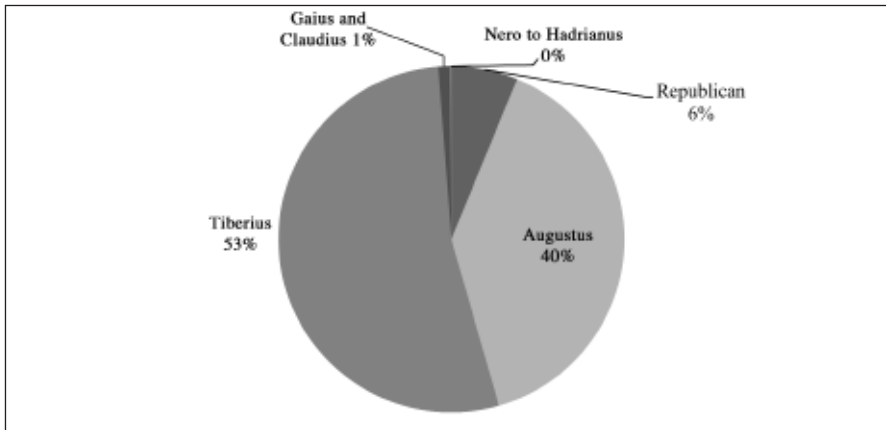
If we leave aside the Late Antiquity period, the import of Indian commodities into the Roman Empire was parallel with an export to India of Roman silver *denarii* and gold *aurei*<sup>30</sup>. By my count, there are 5,728 *denarii* found in India that have been more or less reliably and precisely recorded. Among them, 6% are republican, 39% go back to Augustus, 54% to Tiberius, and 1% to Gaius and Claudius.

On the other hand, the number of *aurei* more or less reliably and precisely recorded, to my knowledge, amounts to 1,243, ranging from Augustus to Caracalla. Of this total, 63% of the coins pre–date the Neronian reform of AD 64. If we restrict the sample in order to get a specimen comparable to the Vesuvian evidence, the percentage of the pre–reform *aurei* (822 in total) rises to 97% of the Julio–Claudian and Flavian issues.

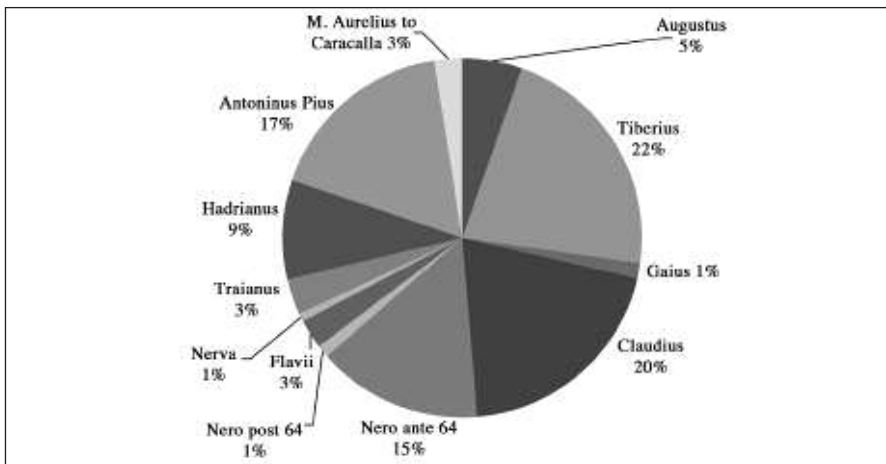
<sup>28</sup> On the role of the Campanian merchants in India trade, DE ROMANIS 1996.

<sup>29</sup> DUNCAN–JONES 2003, 167–168.

<sup>30</sup> Plin., n.h. VI 101; XII 84; Periplus Maris Erythraei 39; 49; 56; Tac., ann. III 53. At least in South India, export of Roman coins was not a ‘Randphänomen’ (WALSER 2001, 95): Akanānūru 149; Purānānūru 343. A list of the findings, below.



3. *Denarii* found in India (5,728)<sup>31</sup>



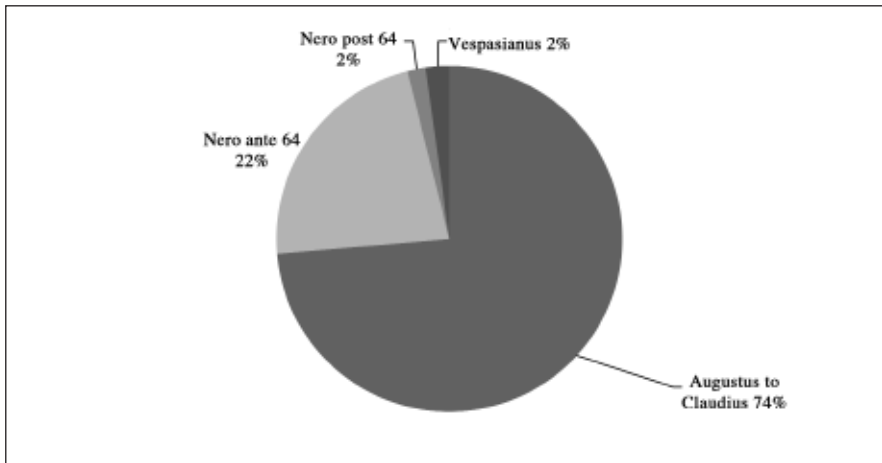
4. *Aurei* found in India (1,243)

Therefore, Vesuvian and Indian samples agree in signaling a remarkable scarcity of Gaius, Claudius and Nero *denarii*, which are likewise

<sup>31</sup> Here and in graphic 8, the 72 *denarii* from the Coimbatore district hoard which are indistinctly attributed to Augustus and Tiberius (RASCHKE 1978, 993 n. 1396) are divided according to the *ratio* deduced from the rest of the evidence, 43% to Augustus and 57% to Tiberius.



rare in the western provinces<sup>32</sup>. They strongly disagree in the proportions of pre- and post-reform *aurei* and of Republican and Julio-Claudian *denarii*. Pre-reform *aurei* comprise 9% of the specimens from Pompeii, Herculaneum and Oplontis and 96% of the Indian sample. Republican *denarii* make up 79% of the silver coinage from Pompeii, but only 6% of the *denarii* found in India. Augustus and Tiberius *denarii* constitute less than 5% at Pompeii; they are 93% in India.



5. *Aurei* found in India Augustus to Vespasian (822)

c. *The rhythm of coin hemorrhaging*

When did *denarii* and *aurei* found in India reach the sub-continent? Sture Bolin posited that the coins sent to India never circulated on the Roman money market: Roman wholesale importers would have obtained those coins either “direct from the mint or from money-changers with large stocks of newly minted *aurei* and *denarii*, and taken on board and shipped them to India”<sup>33</sup>. By contrast, David MacDowall argued that most if not all of the pre-reform coins found in India would have been sent there only after AD 64, when the concurrence of *aurei* and *denarii* of different standards would

<sup>32</sup> Cfr. above nt. 26.

<sup>33</sup> BOLIN 1958, 73; cfr. also CRAWFORD 1980.

have boosted the export of the suddenly undervalued pre-reform coins<sup>34</sup>.

Although opposed to each other as far as export chronology is concerned, Bolin's and MacDowall's theories do share the conviction that the export of Roman coins to India was a phenomenon completely disconnected from the general dynamics of Rome's monetary economy. In Bolin's view, the wholesale merchants would get the coins from the mint, either directly or through money-changers. For MacDowall, the merchants would collect only *de facto* demonetized coins. The outflow of coins would impact the state's bullion reserves in Bolin's scenario and private hoardings in MacDowall's: in either case, it would not affect the monetary circulation. To argue for the impact of the India trade on the composition of the monetary mass in the Vesuvian area before AD 79 would be altogether illegitimate in Bolin's opinion, and admissible only for the period AD 64–79 for MacDowall.

While no die linkages have been recovered so far to substantiate Bolin's assumption<sup>35</sup>, the discovery of a Vespasian countermark<sup>36</sup> on one of the CL CAESARES *denarii* of the Budinatham hoard<sup>37</sup> has shown that that piece at least left the Roman Empire long after its emission and when both pre- and post-reform *denarii* were in circulation. Does that countermark provide the ultimate validation of the MacDowall's theory? Were all the *denarii* therefore exported only after AD 64? Should we consequently conclude that Nero's reform triggered a sort of monetary tsunami that overwhelmed India with the undervalued coins of the Roman monetary mass? I do not think so. As a matter of fact, the underlying premises of this theory – that Roman coins were exported only as bullion and that Roman merchants exported coins only when they became undervalued<sup>38</sup> – are difficult to reconcile with the evidence.

Of course, Indian public was sensitive to the intrinsic value of the Roman coins, but if Roman coins were exported to India only as

<sup>34</sup> MACDOWALL 1991, 151–152; MACDOWALL 1996, 92–94.

<sup>35</sup> MACDOWALL 1996, 83.

<sup>36</sup> BERGHAUS 1998, 126.

<sup>37</sup> 1,398 *denarii*, 369 Augustan of the CL CAESARES type, 1029 of the Tiberius' PONTIF MAXIM type.

<sup>38</sup> MACDOWALL 1991, 145–146.

bullion, it would be hard to understand why they were not immediately melted down. Further, it would be impossible to explain why they were exchanged at a profit against the local currency<sup>39</sup> or why they were imitated there<sup>40</sup>. Moreover, if a massive export of Roman coins to India did not begin before AD 64, Tacitus would be blatantly anachronistic when he inserted in Tiberius' letter of AD 22 a complaint about the outflow of coins to foreign or hostile nations<sup>41</sup>. Keep in mind also that it was in connection with information dating back to AD 49/52 that Pliny the Elder quantified as 50,000,000 HS the annual deficit to India<sup>42</sup>. It was in the age of Claudius (or slightly before) that a freedman of Annius Plocamus sailed in the Indian Ocean with silver *denarii* of different types but equal weight<sup>43</sup>. And it was in Epeiph 28<sup>th</sup> AD 62 that 3 ¼ talents – probably in Roman coins – were delivered in Myos Hormos, apparently for export to India<sup>44</sup>.

As for the *denarius* with the Vespasian countermark, regardless of when and where it joined the other pieces of the Budinatham hoard<sup>45</sup>, it is clear that the coin was selected to be sent to India not because it was generically pre-reform, but because it was of a type already widely known and accepted in India long before the Budinatham piece crossed the ocean<sup>46</sup>. Therefore, the CL CAESARES *denarii* must have first been

<sup>39</sup> Periplus Maris Erythraei 49.

<sup>40</sup> A terracotta mould with the reverse of the Tiberius PONTIF MAXIM type has been found next to a kiln in Talkad: NARASIMHA MURTHY/DEVARAJ 1995. For imitations of Roman *aurei* in India, see METCALF 1979; BERGHAUS 1994; 2006.

<sup>41</sup> Tac., ann. III 53: *lapidum causa pecuniae nostrae ad externas aut hostilis gentis transferuntur*.

<sup>42</sup> Plin., n.h. VI 101. For the chronology, DE ROMANIS 1997; *pace* DESANGES 2012.

<sup>43</sup> Plin., n.h. VI 85.

<sup>44</sup> O. Petr. Mus. 147 = O. Petrie 290. I prefer to understand ll. 8–9 as referring to 3 and ¼ talents in money and a *fiscus* of silverware. Ships bound for India used to leave Egypt in (alexandrian) Epeiph: Periplus Maris Erythraei 39; 49; 56. Roman coins and silverware are mentioned among Roman exports to Barygaza: Periplus Maris Erythraei 49.

<sup>45</sup> 1,398 *denarii*, 369 Augustus, CL CAESARES type; 1,029 Tiberius, PONTIF MAXIM type.

<sup>46</sup> Out of 5,656 identified *denarii* 1,786 (31.57%) belong to that issue; 114 (2%) to other Augustan types; and 324 (5.72%) are unspecified Augustan. Tiberius' PONTIF MAXIM *denarii* are 3,008 and constitute 53.18% of the total; republican *denarii* are 362, which make 6.4%.

sent to India when they represented the best of the coinage available in the trading emporia of the Mediterranean and continued to be exported up to the time of Vespasian<sup>47</sup>, despite the fact that the issue was by then extremely rare in places like Pompeii.

To make sense of this rhythm of export, it may help to consider the financial implications of the Mediterranean redistributive network underpinning the India trade in the first centuries AD. The two texts of the so-called Muziris papyrus show that India traders sold most of their cargos in Alexandria, to merchants trading with different areas of the Mediterranean. Among them, merchants trading between Alexandria and central Italy (Puteoli or, eventually, Ostia) got of course the lion's share. In turn, these merchants must have sold their commodities to regional retailers. This down-the-line pattern of sale would have been accompanied by a corresponding down-the-line increase in the prices of the goods. The Indian cargo of the vessel *Hermapollon* was fiscally valued in Egypt at almost 10,000,000 drachmas. It may have been sold for roughly 20,000,000 HS in Alexandria and 40,000,000 HS in Italy<sup>48</sup>. The cost of that cargo in India is more difficult to estimate, but it was hardly greater than a few million sesterces. Therefore, while the acquisition of Indian goods provoked the hemorrhaging of Roman coins to India, the internal exchange of these goods, coupled with the escalations of price, would have generated far more significant accumulations of money *inside* the empire. It is reasonable to assume that those financial transactions were carried out with a good deal of credit money<sup>49</sup>, but the Roman coin hoards in India show nonetheless that India traders could make a careful selection of the coins bound for India: for each *denarius* or *aureus* sent there, several were amassed in Alexandria, Berytus and Antiochia, and even more in Puteoli.

Since the Augustan age, the prosperity of the India trade would have encouraged richer individuals living near the trade centers to divert and accumulate those issues that had become the most sought after in

<sup>47</sup> TCHERNIA 1995.

<sup>48</sup> DE ROMANIS forthcoming.

<sup>49</sup> HARRIS 2006; 2008. How did Lollia Paulina pay the 40,000,000 HS (Plin., n.h. IX 117) of her *parure*?

the Indian Ocean emporia. It therefore comes as no surprise that, compared to the Vesuvian evidence, peripheral hoards of the second half of the first century AD include higher percentages of the types most common in India<sup>50</sup>. Moreover, the modest (but not immaterial) proportions of CL CAESARES and Tiberius' PONTIF MAXIM *denarii* in earlier hoards from northern Italy and Sicily<sup>51</sup>, as well as the high percentage of pre-reform *aurei* in the anomalous hoard of Vibo Valentia (Monteleone)<sup>52</sup>, do not support the interpretation that Vesuvian rarities were the result of a geographically restricted distribution.

Amassed by the (financiers of the) India traders in Puteoli, Alexandria, and the Syrian cities since 2 BC, the *denarii* of the CL CAESARES had already disappeared from circulation in Rome and central Italy by the Tiberian years. In AD 22, there was no need to resort to statistics to be aware of the outflow of coins 'to foreign and even hostile nations': it sufficed to note that, unlike the old republican *denarii*, the new issues were soon untraceable in the monetary circulation of Rome and central Italy. They reappeared in the emporia of the eastern Mediterranean. At 'Isfiya on the slopes of the Mount Carmel, together with 3,400 Tyrian tetradrachms and 1,000 didrachms, 160 CL CAESARES *denarii* were hoarded after AD 52/3<sup>53</sup>. From the

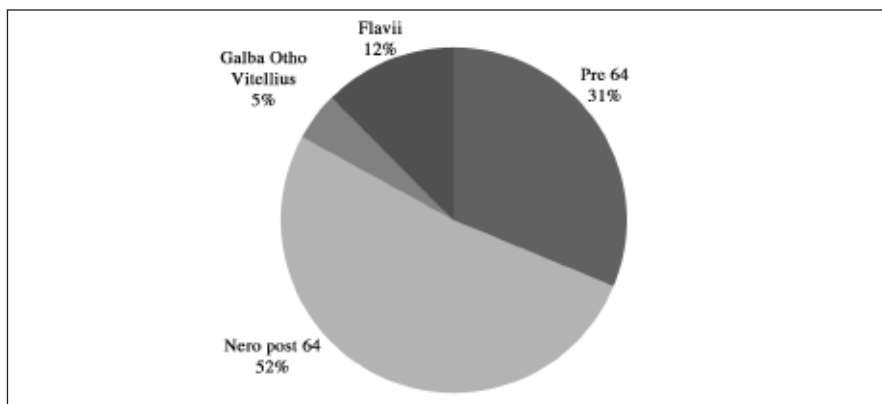
<sup>50</sup> In the Dombresson hoard (408 *denarii* and 6 *aurei*, end-date AD 55) there are 10 *denarii* (2.45%) and 1 *aureus* of the CL CAESARES issue, and 49 *denarii* (12%) and 2 *aurei* of the Tiberius' PONTIF MAXIM issue: ESTIOT-AYMAR 2002, 153–154; in the Utrecht hoard (50 *aurei*, end-date AD 69), 22 (44%) are pre-reform: THIRION 1972, 79; in the Shillington hoard (127 *aurei*, end-date AD 79) 22 (17%) are pre-reform: CURTEIS-BURLEIGH 2002, 65–74; in the Friume hoard (410 *denarii* and 1 *aureus*, end date: AD 84), there are 57 *denarii* (13.9%) of the CL CAESARES and 58 (14.1%) of the Tiberius' PONTIF MAXIM issues: CASTRO HIPÓLITO 1960/1, 25–28.

<sup>51</sup> In the Bagheria hoard (318 *denarii*, end-date 2 BC– AD 14), 22 (6.9%) are of the CL CAESARES issue: MACALUSO 1995. In the Concordia (Cinto Caomaggiore) hoard (end-date 37 AD), out of 3,881 *denarii*, 220 (5.6%) are of CL CAESARES and 41 (1.05%) of the PONTIF MAXIM issue: BACKENDORF 1998, 292–301.

<sup>52</sup> Its description (GNECCHI 1892, 263) is somewhat confused, but despite the Flavian end-date, the pre-reform *aurei* must have constituted the overwhelming majority of the 73 *aurei*.

<sup>53</sup> KADMAN 1962; MEIR 2009; 2010; in the 'Isfiya hoard, the *denarii* represent little more than 1% of the entire face value, but the fact that they are all of the CL CAESARES type is "reminiscent of the content of hoards of Roman coins in India" (BUTCHER 1996, 102).

eastern Mediterranean, CL CAESARES and Tiberius' PONTIF MAXIM *denarii* kept nurturing the India trade for quite some time after AD 37: the *Periplus Maris Erythraei*, written between AD 40 and 70, records the export of silver *denarii*<sup>54</sup> that must have been of those types. The Budinathan CL CAESARES *denarius* with Vespasian's countermark was almost certainly exported after the *Periplus Maris Erythraei* was written.



6. *Aurei* from Boscoreale hoard (1,084) (from CANTILENA 2007)

Tiberius' coins contribute to Indian hoards not only with the highest number of *denarii*, but also with the highest number of *aurei*, part of which must have been seized by the trading *élites* after Gaius rapidly squandered Tiberius' enormous cash reserve of 2.7 (or 2.4 or 3.3) billion HS<sup>55</sup>. The change from a prevalent use of *denarii* to a prevalent use of *aurei*<sup>56</sup> must go back to the years after AD 37. When, later on, Nero's reform ultimately prioritized the pool of exportable gold coins, the hunt for the heavier pre-reform *aurei* became more and more dogged. Of course, richer people could keep their pre-AD 64 *aurei* longer: out of 1,038 identified *aurei* from the Boscoreale hoard

<sup>54</sup> *Periplus Maris Erythraei* 8; 49.

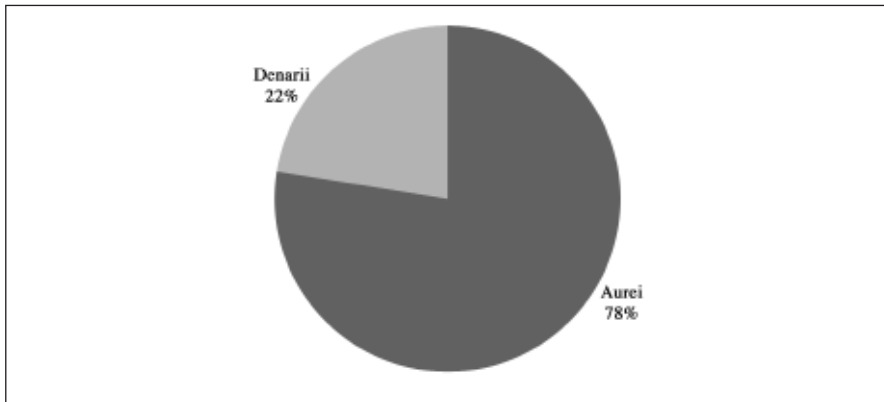
<sup>55</sup> Suet., Cal. 37, 3; Cass. Dio LIX 2, 6.

<sup>56</sup> RODEWALD 1976, 49–50.

(1,350 *aurei*, end-date AD 79), pre-reform issues represent 31.2% of the total<sup>57</sup>; of the once big hoard of Cumae (about 1000 *aurei*, end-date AD 88), 16 of the 75 pieces bought by Riccio (21.3%) were pre-reform<sup>58</sup>. By contrast, the much smaller reserves held by the far less rich victims of the AD 79 eruption<sup>59</sup> show only 9% of pre-AD 64 issues.

d. *Gold and silver in Julio-Claudian emissions*

Because the India traders kept on exporting pre-reform coins well after the Julio-Claudian dynasty, Indian hoards of Roman coins are of limited assistance in reconstructing the ups and downs of the Indo-Roman trade. Instead, being the result of a long-term deliberate selection process, they may help explain the pace of a crucial evolution in the Roman monetary system. Taken as a whole, the face value of the pre-AD 64 coins found in India consists of 22% of *denarii* and 78% of *aurei*.



7. Face value of the pre AD 64 Roman coins found in India (Total: 101,908 HS)<sup>60</sup>

<sup>57</sup> CANTILENA 2005, 674;

<sup>58</sup> RICCIO 1868.

<sup>59</sup> At Oplontis, one skeleton has been found with little less than 11,000 HS (101 *aurei*) in total: CASTIGLIONE MORELLI 2003, 174–197. Other major hoards are between 4,500 and 7,500 HS (40 to 69 *aurei*): CANTILENA 2005, 678.

<sup>60</sup> Since it was found with coins of earlier emperors, the Tondamanathan *aureus* of Nero of unspecified type is very likely pre-reform. Therefore, in the graphics 7 and 8 it has been included in the pre-AD 64 coins.

Such a proportion, however, results from an uneven distribution. In the pre-AD 14 coins, *denarii* represent as much as 61% of the face value<sup>61</sup>. On the other hand, among the coins of Tiberius, they comprise only 31%, although in Indian findings Tiberius' *denarii* outnumber all the other *denarii*. Moreover, the face value of the *denarii* of Gaius, Claudius and Nero is immaterial compared to that of the *aurei*.

The evidence therefore suggests that among the Augustan coins available to traders and eventually sent to India, the *denarii* exceeded the *aurei* in terms of face value, whereas the opposite was true among the Tiberian coins. In my view, this change in Indian hoard compositions mirrors a comparable change in the proportions of the emissions inside the empire, so that Tiberius' emissions of *aurei* must have been far more substantial than those of Augustus.

From 46 BC (when Caesar coined 20,414 pounds of gold, which represented only 5% of the money given to his soldiers<sup>62</sup>) to AD 79 (when, in terms of face value, gold coins represented the majority of the monetary mass in Pompeii), the expansion of gold coinage in the Roman monetary mass must have been impressive; its pace, however, is not known. It has been assumed that “from 46 onwards [...] gold was minted on a large regular basis”<sup>63</sup>. I would argue that gold coinage expansion in the Roman monetary system was not so gradual. Undeniably, with Augustus, the *aureus* got a stable position within the Roman monetary system, but for quite some time gold emissions did not represent the major part of the Roman monetary mass. In fact, some of the Augustus' decisions do not reflect those of a leader who is building a monetary system in which the gold coinage has the prominent role suggested by the Vesuvian data. In the crucial year 29 BC, when around 1 billion HS was spent in Italy<sup>64</sup>, Augustus refused 35,000 pounds of *aurum coronarium* (= 140,000,000 HS)<sup>65</sup>, dumped in

<sup>61</sup> Even if we remove the republican issues, the face value of the Augustan *denarii* still surpasses that of the *aurei* (57% versus 43%).

<sup>62</sup> App., b.c. II 15, 102.

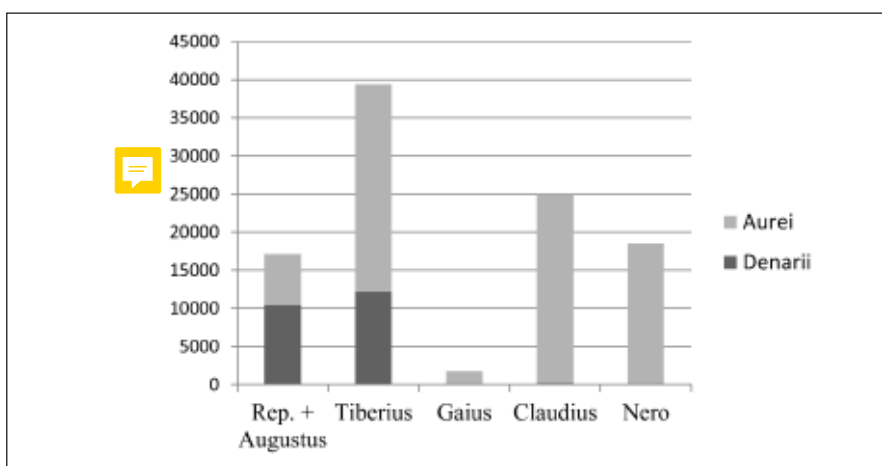
<sup>63</sup> VERBOVEN 2000, 62.

<sup>64</sup> FRANK 1959, 14.

<sup>65</sup> R.G. 21.



the Capitol 16,000 pounds of gold (= 64,000,000 HS) from the Egyptian booty<sup>66</sup>, and dedicated gold tripods for the temple of Apollo in the Palatine with the *denarii* obtained from melting down eighty silver statues erected in his honor<sup>67</sup>. Later on, he continued to refuse – on as many as fourteen occasions – the *aurum coronarium* that was offered, with unchanged generosity, each time he was acclaimed *imperator*.



8. Face value of the pre AD 64 Roman coins found in India (Total: 101,908 HS)

Among the *denarii* found in India, the overwhelming predominance of the CL CAESARES and Tiberius' PONTIF MAXIM types – minted between 2 BC and AD 37 – suggests that most of these coins fell into the hands of trading *élites* at a time when they were considered the best of those readily available in an area characterized by a significant consumption of Indian commodities. Both circumstances may have occurred in central Italy for several decades after 2 BC.

It seems fair to assume that the *congiaria* encouraged the

<sup>66</sup> R.G. 21; Suet., Aug. 30.

<sup>67</sup> R.G. 24; Suet., Aug. 52.

consumption of products like black pepper by the urban *plebs*<sup>68</sup>. It is also likely that at least some of the *congiaria* between 2 BC and AD 37 were paid with newly minted *denarii*. In particular, it is likely that the *congiarium* of 2 BC – 60 *denarii* to each of the plebeians of the *plebs frumentaria*, which then numbered just over 200,000<sup>69</sup> – was paid entirely with *denarii* of the CL CAESARES type. Other payments may have also been made – at least in part – with silver *denarii* of the CL CAESARES and Tiberius' PONTIF MAXIM types: the roughly 292,000,000 HS received by the Roman *plebs* between AD 13 and 37<sup>70</sup>; the 100,000,000 HS lent to the Italic landowners in AD 33<sup>71</sup>; the 100,000,000 HS given to refund the damages of the fire of AD 36<sup>72</sup>; and the regular pay and the extraordinary *donativa* to the *cohortes praetoriae*, the *cohortes urbanae* and the *cohortes vigilum*<sup>73</sup>. None of these coins survived in the hoard Rome 1882<sup>74</sup>, nor did any in Ostia<sup>75</sup>. Only one did in the Civita Castellana (*Falerii*) hoard<sup>76</sup> and very few in the Vesuvian area<sup>77</sup>. It is therefore clear

<sup>68</sup> Debates on *luxus* in AD 16 and AD 22 (Tac., ann. II 33; III 52–55) follow the *congiaria* of AD 15 and AD 20. In AD 22 complaints about soaring prices of provisions (Tac., ann. III 52) are also recorded.

<sup>69</sup> R.G. 15.

<sup>70</sup> 45,000,000 HS in 13 AD, 40,000,000 HS in 15 AD, 45,000,000 HS in 17 AD, 36,000,000 HS in 20 AD, 36,000,000 HS in 23 AD and 90,000,000 HS 37 AD: VAN BERCHEM 1939, 142–147.

<sup>71</sup> Tac., ann. VI 17.

<sup>72</sup> Tac., ann. VI 45.

<sup>73</sup> The pay of the soldiers in Rome may have amounted to some 20,000,000 HS per year, if in those years the praetorians were around 4,500 (so DURRY 1938, 82–89; 1954, 1613–1614), to more than 30,000,000 HS per year, if they were 9,000 (so PASSERINI 1939, 58–67). – In his will, Augustus left 1000 HS each to the soldiers of the *cohortes praetoriae*, 500 HS to those of the *cohortes urbanae* (Tac., ann. I 8, 5; Suet., Aug. 101, 2; Cass. Dio LVI 32, 2). Tiberius had left 1000 to the praetorians, but Gaius doubled the sum (Cass. Dio LIX 2, 1). CL CAESARES *denarii* were largely used for the pay of the army, in Germania as well as in Dalmatia: BERGER 1996, 25–27.

<sup>74</sup> 298 *denarii* end–date 79 AD: MILANI 1888, 290–316.

<sup>75</sup> SPAGNOLI 2007.

<sup>76</sup> CH 528: 391 *denarii* end–date 2 BC–14 AD. I owe the information about the number of the CL CAESARES issue to the courtesy of Dott.ssa G. Angeli Bufalini.

<sup>77</sup> Dott.ssa T. Giove was gracious enough to inform me that, among the 1,344 silver coins inventoried by her from the *regio I* of Pompeii, there are only one *denarius* of the CL CAESARES and only one of the Tiberius' PONTIF MAXIM issue. Prof.ssa R. Vitale kindly specifies that in her sample of 2,445 silver coins from Pompeii there are only five

that only the Indian (and, in addition, the Georgian<sup>78</sup>) hoards lend plausibility to the hypothesis that the *congiarium* of 2 BC was paid with more than 12,000,000 *denarii* of the CL CAESARES type.

In AD 14 Augustus' friends were each given 40 *aurei* on the condition that they buy items imported from Alexandria to Puteoli<sup>79</sup>. Needless to say, the most valuable items came from the Indian Ocean regions. The finds from India, however, show that most of their contemporaries had to buy those same goods with silver *denarii*, apparently because silver continued to function as the backbone of the Roman monetary mass. By contrast, Tiberius' cash reserve, almost twice (or more than twice) the money distributed by Caesar in 46 BC, must have been largely in gold coins. It was piles of *aurei* Gaius used to walk over and wallow in<sup>80</sup>, and it was mostly gold coins that were issued by Claudius<sup>81</sup>. Gold coins made up the bulk of the 2.2 billion HS dissipated in extravagancies by Nero's beneficiaries<sup>82</sup>. Yes, it was Augustus who gave the *aureus* a stable position inside the Roman monetary system, but it was his immediate successor who started the large-scale production of gold coinage<sup>83</sup>, just as it was Tiberius, not Augustus, who launched the massive exploitation of Asturian gold mines<sup>84</sup>. The first emperor could have hardly predicted a development of this sort. Just a few years after his death<sup>85</sup>, the Roman monetary system would enter a new era.

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of the CL CAESARES and one of the Tiberius' PONTIF MAXIM issue. In Oplontis, two CL CAESARES *denarii* have been found: CASTIGLIONE MORELLI 2000, 205.

<sup>78</sup> The significant number (350) of CL CAESARES *denarii* found in Georgia (SHEROZIA 2002) has to be explained with the import of items brought from Central Asia: Strab. XI 7, 3.

<sup>79</sup> Suet., Aug. 98, 2.

<sup>80</sup> Suet., Cal. 42.

<sup>81</sup> VON KAENEL 1986, 257, nt. 400; BURGERS 2001, 100.

<sup>82</sup> Tac., hist. I 20.

<sup>83</sup> GIARD 1983, 47: "[...] le nombre des monnaies [sc. PONTIF MAXIM issues] semble avoir été assez élevé"; cfr. 124–129, where 94 obverse and 93 reverse types of the PONTIF MAXIM *aurei* are listed.

<sup>84</sup> DOMERGUE-SILLIÈRES 1977, 83; DOMERGUE 1990, 198.

<sup>85</sup> On the chronology of the Tiberian PONTIF MAXIM *aurei*, GIARD 1983, 48; 124–129; SUTHERLAND 1987; DUNCAN-JONES 1994, 251.

*Denarii* found in India (5,728)

	Rep.	Aug. <sup>a</sup> = ante 2 BC <sup>p</sup> = 2 BC or later <sup>u</sup> = uncertain	Tib.	G.	Cl.	N.	Later or unid.	Total
<b>Adam</b> Nath 1996		2 <sup>p</sup>	1					3
<b>Ajaigadh MP</b> Berghaus 1998, 121	1							1
<b>Akenpalle</b> Turner 1989, 47; Berghaus 1992, 240		698 <sup>p</sup>	720	2	12			1,432
<b>Akhilandapuram</b> Turner 1989, 48		2 <sup>p</sup>	3					5
<b>Aleppey</b> Berghaus 1998, 123		4 <sup>u</sup>						4
<b>Arikamedu</b> Berghaus 1992b			2					2
<b>Budinatham</b> Sridhar et al. 2011		369 <sup>p</sup>	1,029					1,398
<b>Bavikonda</b> Krishna Sastry et al. 1992, 78		1 <sup>u</sup>	2					3
<b>Chandravalli</b> Turner 1989, 51		1 <sup>p</sup>	4					5
<b>Coimbatore dis.</b> Turner 1989, 52		1 <sup>u</sup>						1
<b>Coimbatore dis.</b> Turner 1989, 52			2					2
<b>Dakshin Kanara dist.</b> Berghaus 1998, 121	3							3
<b>Dharmapuri dis.</b> Nishathuddeen 1994	1							1
<b>H.A.L. Bangalore</b> Turner 1989, 54		124 <sup>p</sup>	126					250
<b>Iyyal</b> Gupta 1965 (different data in Turner 1989, 55-56; Berghaus 1992a, 126)	5	48	6		7	2	(3)	68
<b>Kallakinar</b> Turner 1989, 57	2							2
<b>Karur</b> Berghaus 1998, 121	1							1
<b>Karur</b> Turner 1989, 59		27 <sup>a</sup>	90				(around 400)	117
<b>Kathanganni</b> Turner 1989, 60; Suresh 2004, 162		49 <sup>p</sup>	184					233
<b>Kodumanal</b> Suresh 2010		1 <sup>p</sup>	1					2
<b>Koneripatti</b> Suresh 1999		6 <sup>p</sup>	29					35
<b>Kotapad</b> Turner 1989, 61		3 <sup>u</sup>	1					4
<b>Krishnagari</b> Berghaus 1998, 121	1							1
<b>Lingarajupalem</b> Turner 1989, 63-64		1 <sup>u</sup>	1					2
<b>Mambalam</b> Turner 1989, 65		1 <sup>u</sup>						1

JULIO-CLAUDIANN *DENARII* AND *AUREI* IN CAMPANIA AND INDIA

<b>Mangalore</b> Berghaus 1998, 124		19 <sup>a</sup>	26					45
<b>Manikyala</b> Turner 1989, 66	6					(1)		6
<b>Nasik</b> Berghaus 1998, 120	2							2
<b>Nasthullapur</b> Turner 1989, 70		12 <sup>a</sup>	25					37
<b>Navalai</b> Suresh 2004, 163			1					1
<b>Nedumkandam</b> Berghaus 1998, 120, 123	40	52 <sup>a</sup> + 34 <sup>b</sup>						126
<b>Pakli</b> Turner 1989, 72-73	8	12 <sup>a</sup>	3				1 Hadrianus	24
<b>Peddabankur</b> Turner 1989, 73		1 <sup>a</sup>						1
<b>Pennar</b> Turner 1989, 73		1 <sup>a</sup>						1
<b>Phanigiri</b> Chenna Reddy 2008, 26		1 <sup>a</sup>						1
<b>Poonjar</b> Turner 1989		1 <sup>a</sup>						1
<b>Salihundam</b> Turner 1989, 77			11					11
<b>South India</b> Turner 1989, 105-106	4							4
<b>Taxila</b> Turner 1989, 78			1					1
<b>Tirukoilur</b> Radhakrishnan 1999			3					3
<b>Tiruppur</b> Suresh 2009	1							1
<b>Tothlakonda</b> Krishna Sastry et al. 1992, 82-84			5					5
<b>Trichur/Lacc. Isl.?</b> Turner 1989, 90; Berghaus 1998, 120	279 (+ 1 Juba I)	130 <sup>a</sup> + 159 <sup>b</sup>	18					587
<b>Trichur</b> Berghaus 1998, 121	1							1
<b>Uthamapuram</b> Santhalingam 1997		10 <sup>a</sup>						10
<b>Vellalur</b> Turner 1989, 81-82		1 <sup>a</sup> + 134 <sup>b</sup>	378	3	5	1		522
<b>Vellalur</b> Turner 1989, 82-83		1 <sup>a</sup> + 188 <sup>b</sup>	329	8	18	3		547
<b>Vellalur</b> Turner 1989, 82-83		121 <sup>a</sup>						121
<b>Vellanthavalam</b> Suresh 2004, 165		1 <sup>a</sup>						1
<b>Vidyadurrapuram</b> Turner 1989, 84			1					1
<b>Yeswantpur</b> MacDowall 2001/2002		2 <sup>a</sup> + 5 <sup>b</sup>	6	1	5			19
<b>Total</b>	<b>356</b>	<b>2,223</b> 1,786 <sup>b</sup> 114 <sup>a</sup> 323 <sup>b</sup>	<b>3,008</b>	<b>14</b>	<b>47</b>	<b>6</b>	<b>1</b>	<b>5,655</b>
<b>Coimbatore dis.</b> Raschke 1978, 993 n. 1396		<b>72</b>		<b>1</b>				<b>73</b>
								<b>5,728</b>

*Aurei* found in India Augustus to Vespasian (822)

	Aug <sup>a</sup> = ante 2 BC <sup>p</sup> = 2 BC or later <sup>u</sup> = uncertain	Tib	Gaius	Claudius	Nero <sup>a</sup> = ante AD 64 <sup>p</sup> = post AD 64 <sup>u</sup> = uncertain	Vesp	Total
<b>Adam</b> Turner 1989, 46	1 <sup>a</sup>	10					11
<b>Alluru</b> Sarma 1992				1			1
<b>Bishopdown</b> Turner 1989, 50				1			1
<b>Dharmavaripalem</b> Krishna Sastry 1992, 17-23; Berghaus 1991, 113, nt. 22		1			1 <sup>p</sup>		2
<b>Gootiparti</b> Turner 1989, 53				1			1
<b>Iyyal</b> Gupta 1965, 58-59; Turner 1989, 55-56		8		2	1 <sup>a</sup>		11
<b>Kadmat Island</b> Turner 1989, 57						5	5
<b>Kaliyampattur</b> Turner 1989, 58		6	1	18	17 <sup>a</sup>		42
<b>Karivalamvandanallur</b> Turner 1989, 58					2 <sup>p</sup>	2	4
<b>Karur</b> Turner 1989, 59	1 <sup>a</sup>	1		3			5
<b>Karur</b> Raman 1992, 22				1			1
<b>Kondapur</b> Turner 1989, 61		1					1
<b>Kottayam</b> Turner 1989, 62-63	4 <sup>a</sup> 2 <sup>p</sup> 3 <sup>u</sup>	28	2	16	16 <sup>a</sup>		71
<b>Kottayam</b> Satyamurthy 2011, 23 (SI No13 – incorrectly identified)				1			1
<b>Madurai Hills</b> Turner 1989, 65				5	3 <sup>e</sup>		8
<b>Mallayapalem</b> Turner 1989, 65-66					1 <sup>p</sup>		1
<b>Mankada</b> Turner 1989, 67					1 <sup>a</sup>		1
<b>Nagarjunakonda</b> Turner 1989, 68		1					1
<b>Nagavarapupadu</b> Krishna Sastry et al. 1992, 4-16	9 <sup>p</sup>	20		25	3 <sup>e</sup>		57
<b>Nandyal</b> Turner 1989, 69-70	1 <sup>a</sup> 1 <sup>p</sup>	17		8	20 <sup>a</sup>		47
<b>Ongole</b> Turner 1989, 72					1 <sup>p</sup>		1
<b>Pedakodamagundla</b> Krishna Sastry et al. 1992, 3-4					1 <sup>p</sup>		1
<b>Penuganchiprolu</b> Subrahmanyam et al. 2008 (some incorrect identifications)	1 <sup>p</sup>	6 (1 <sup>imp?</sup> )		5	1 <sup>p</sup> 7 <sup>e</sup>	1	20
<b>Phangiri</b> <i>The Hindu</i> , March 19, 2011							

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<b>Poonjar</b> Turner 1989, 74	1 <sup>u</sup>			2	1 <sup>p</sup>		4
<b>Pudukkottai</b> Hill 1898; Turner 1989, 74-77 (some inaccuracies); Suresh 2007	17 <sup>s</sup> 25 <sup>p</sup>	167	14	159	116 <sup>t</sup>	3	501
<b>Tondamanathan</b> Turner 1989, 78; but cfr. Wheeler 1951, n. 31	1 <sup>a</sup>	3		1	1 <sup>u</sup>		6
<b>Valuvally</b> Satyamurthy 2011; Berghaus 1992a, 241; 1994					6 <sup>p</sup>	7	13
<b>Veeravasaramu</b> Turner 1989, 80		1					1
<b>Vinukonda</b> Turner 1989, 84-85		2				1	3
<b>Total</b>	<b>67</b> (25 <sup>s</sup> 38 <sup>p</sup> 4 <sup>u</sup> )	<b>271</b>	<b>17</b>	<b>250</b>	<b>199</b> (184 <sup>t</sup> , 14 <sup>p</sup> , 1 <sup>u</sup> )	<b>18</b>	<b>822</b>

*Aurei* found in India Domitian to Caracalla (421)

	Domitianus to Hadrianus	Pius to Commodus	Severus to Caracalla	Total
<b>Ahin Posh</b> Turner 1989, 46	3 (1 Dom, 1 Tr, 1Hadr)			3
<b>Akkialur</b> Gupta 1984; Turner 1989, 48			3 (2 Sev, 1 Car)	3
<b>Athirala</b> Turner 1989, 48	1 (1 Tr)			1
<b>Bilaspur</b> Turner 1989, 49			1 (1 Sev)	1
<b>Bilaspur</b> Turner 1989, 50	1 (1 Hadr)	1 (1 Com)	1 (1 Sev)	3
<b>Chakherbedha</b> Turner 1989, 51		2 (2 Com)		2
<b>Dharmavaripalem</b> Krishna Sastry 1992, 17-23; Berghaus 1991, 113, nt. 22; Suresh 2004, 166	1 (1 Dom)			1
<b>Dharpul</b> Turner 1989, 53		2 (2 MAur)	5 (5 Sev)	7
<b>Goa</b> Turner 1989, 53			1 (1 Sev)	1
<b>Gootiparti</b> Berghaus 1993a	1 (1 Tr)			1
<b>Gumada</b> Turner 1989, 54			1 (1 Sev)	1
<b>Iyyal</b> Gupta 1965, 58-59; Turner 1989, 55-56	1 (1 Tr)			1
<b>Kadmat Island</b> Turner 1989, 57		10 (9 AntP 1Comm)		10
<b>Kaliyampattur</b> Turner 1989, 58	7 (5 Dom, 2 Ner)			7
<b>Karivalamvandanallur</b> Turner 1989, 58	2 (1 Dom, 1 Hadr)			2
<b>Karur</b> Raman 1992, 22		1 (MAur)		1
<b>Karur</b> Suresh 2004, 162		2 (AntP)		2
<b>Kumbalam</b> Berghaus 1993b, 29-36	1 (1 Hadr)	8 (AntP)		9
<b>Madurai</b> Turner 1989, 64	1 (1 Dom)			1
<b>Madurai Hills</b> Turner 1989, 64-65	1 (1 Dom)			1
<b>Mallayapalem</b> Turner 1989, 65	2 (2 Tr)	1 (AntP)		3
<b>Manikyala</b> Turner 1989, 66		5 (AntP)		5
<b>Mathura</b> Turner 1989, 67			1 (1 Car)	1
<b>Memadakchedi</b> Turner 1989, 67			1 (1 Sev)	1
<b>Mysore</b> Turner 1989,67- 68		1 (1 Comm)		1
<b>Nagarjunakonda</b> Turner 1989, 68	1 (1 Hadr)			1



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<b>Nagarjunakonda</b> Turner 1989, 68		1 (1 AntP)		1
<b>Nagdhara</b> Turner 1989, 69		1 (MAur)		1
<b>Nandyal</b> Turner 1989, 69-70	4 (1 Dom, 1 Ner, 2 Tr)	2 (2 AntP)		6
<b>Nellore</b> Turner 1989, 71	7 (3 Tr, 4 Hadr)	1 (1 AntP)		8
<b>Ongole</b> Turner 1989,72	1 (1 Hadr)			1
<b>Pedakodamagundla</b> Krishna Sastry 1992, 3-4; Suresh 2004, 169	1 (1Hadr)	1 (1 AntP)		2
<b>Penuganchiprolu</b> Subrahmanyam et al. 2008	8 (1 Dom, 3 Ner, 2 Tr, 2 Hadr)	4 (4 AntP)	2 2 (Sev)	14
<b>Phanigiri</b> The Hindu, March 19, 2011	1 (1 Ner)			1
<b>Poonjar</b> Turner 1989, 74		2 (2 AntP)		2
<b>Sampewada</b> Turner 1989, 78		1 (1 Comm)		1
<b>Tirukkollur</b> Berghaus 2006			1 (1 Car)	1
<b>Valuvally</b> Satyamurthy 2011; Berghaus 1992a, 241; 1994	127 (2 Dom, 2 Ner, 27 Tr, 96 Hadr)	172		299
<b>Vinukonda</b> Turner 1989, 84-85	3 (1 Dom, 2 Hadr)	8 (6 AntP, 1 MAur, 1Comm)	1 (1 Car)	12
<b>Waghoda</b> Turner 1989, 85-86			1 (1 Sev)	1
<b>Yeleswaram</b> Turner 1989, 86			1 (1 Sev)	1
<b>Total</b>	<b>175</b>	<b>226</b>	<b>20</b>	<b>421</b>

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