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MONETARY POLICY AND GRESHAM'S LAW
IN THE LATE THIRD CENTURY A.D.*

Introduction

The invention of coinage in pre-classical Greek Ionia, and its diffusion westward into Sicily, Magna Graecia, and eventually Rome in the late fourth century B.C. suggests that both the city-state and economic actors had reached a point in history when barter, and substitute forms of it, were regarded as an obstacle for the development of either trade or official policy involving the exchange of goods and services.¹ By the time bartering had been replaced by buying and selling, or leasing and hiring, the expression of prices in terms of monetary units could be seen as an important element of economic life likely to be tampered with by individuals in both the public and the private sectors, according to their recognized advantage and their ability to do so, be it legitimate – or merely legal – or not.

* This paper saw its infancy in seminars taught in the mid-80s by Dr. W.E. Metcalf at the American Numismatic Society and Prof. Alan Cameron at Columbia University. Both teachers have been very helpful. Considerably more work was added for lectures in Capri and New York in the Fall 2000. I am also grateful to Profs. R.S. Bagnall, J.-M. Carrié, K.W. Harl, W.V. Harris, E. Lo Cascio, and P. Serafin for discussing the topic with me, to Mr. Frank Campbell for letting me use with his generous assistance the splendid library at the ANS, and to Mrs. Deborah Abbott and my wife Cheryl for checking my English.

¹ Paulus (33 *ad ed.*) *Dig.* 18,1,1 *pr.*: «Origo emendi vendendique a permutationibus coepit. Olim enim non ita erat nummus neque aliud merx, aliud pretium vocabatur, sed unusquisque secundum necessitatem temporum ac rerum utilibus inutilia permutabat, quando plerumque evenit, ut quod alteri superest alteri desit. Sed quia non semper nec facile concurrebat, ut, cum tu haberes quod ego desiderarem, invicem haberem quod tu accipere velles, electa materia est, cuius publica ac perpetua aestimatio difficultatibus permutationum aequalitate quantitatis subveniret. Eaque materia forma publica percussa usum dominiumque non tam ex substantia praebet quam ex quantitate nec ultra merx utrumque, sed alterum pretium vocatur.» On this text and its relevance for the present case study, cf. E. Lo Cascio, *Teoria e politica monetaria a Roma tra III e IV d.C.*, in A. Giardina (ed.), *Società romana e impero tardoantico*, I, Bari 1986, 535-57 and 779-801.

Throughout its history, the classical world lacked the concept of a true fiduciary and scriptural money. Ancient currencies derived their nominal value from their content of precious metal, and their use as a legal tender depended on the willingness of economic actors to accept them as means of payment in legal transactions at the rate they could agree upon. Some degree of flexibility undoubtedly existed, since overvaluation of coins with regard to the intrinsic value was a necessity to cover the cost of minting, and to account for the simultaneous circulation of coins with various degrees of wear while retaining the same face value.² How large a discrepancy in weight or fineness was acceptable is a disputed question, but the point of this paper is to show that ancient users of coinage were likely to be attentive to variations in the metallic value of a specific denomination, and that this fact could be taken into consideration by policy makers and minting authorities at times when the political function of coins as the expression of sovereignty and legitimacy took priority over their economic and monetary role. The demonstration of this statement will rest upon a single case study, namely the evolution of Diocletian's monetary system and the circumstances and modalities of one specific aspect of its reform in the last decade of the third century A.D., the resumption of an authentic silver coinage.

The third century is a remarkable period in the history of ancient coinage because of the exceptional availability of first-rate textual and numismatic material supplementing each other. Ancient historians interested in reconstructing monetary policies are usually left with the sole, though multifarious evidence of coins. The study of coin types, legends, styles, die links, metal contents, weights, fineness, individual finds, and hoard composition is most revealing of ideological circumstances, mint organization, origin and size of individual issues, and area and duration of circulation. However, coins cannot record the probable existence of a lively debate on the nature of money³ and remain ambiguous about such problems as the (re-)tariffing of denominations and the level of consciousness of Roman authorities suspected of monetary manipulations.⁴ The curiosity of one classical jurist, the inclusiveness of the compilers of the Digest, the publicity given to imperial legislation, and the durability of

² S. Bolin, *State and Currency in the Roman Empire to AD 300*, Stockholm 1958.

³ Cf. Paulus (33 *ad ed.*) *Dig.* 18,1,1 *pr.* cited above, note 1; and E. Lo Cascio, *How did the Romans View their Coinage and its Function ?*, in C.E. King - D.G. Wigg (eds.), *Coin Finds and Coin Use in the Roman World*, SFMA, 10, Berlin 1996, 273-87.

⁴ Cf. Diocletian's Currency Edict (301); cf. below.

the material on which it was then made accessible to a provincial constituency were sufficient and necessary factors for the analysis of these combined sources to show that by the early fourth century monetary policy was undoubtedly regarded as a sophisticated and efficient tool of government.

Mint system

Let us look briefly at the organization of coin production. When Diocletian became emperor in 284, he took over the mint system of Aurelian and his successors.⁵ Subsequently, he closed some mints (Serdica, and perhaps Tripolis), and opened new ones in the wake of his fiscal and administrative reforms in the early 290s.⁶ By the beginning of the Tetrarchic period (March 1st, 293), the mint system can be subdivided into four groups, Western, Central, North-Eastern, and South-Eastern. The Western group, clearly under the control of the senior Caesar Constantius, included the mints of Lugdunum, Treveri, and eventually Londinium, at least after the usurper Allectus' defeat in 296. Let us note that Treveri, Constantius' capital, held a virtual monopoly over gold and silver coinage in this group.⁷ The Central group included the mints located at Siscia, Aquileia, Ticinum, Rome, and Carthage, where gold, silver, and billon coinages were issued under the control of Maximianus.⁸ The other two groups of mints, one centered in the Balkans and Asia Minor,⁹ the other in Syria and Egypt were overseen by Diocletian and his junior colleague Galerius.¹⁰ The mint system was

⁵ Lugdunum, Ticinum, Rome, Siscia, Cyzicus, Antioch, and Tripolis in Phoenicia. Cf. P.H. Webb, *Roman Imperial Coinage* [hereafter *RIC*] V.2 (London 1933), *passim*, esp. 207; and J. Lafaurie, *Réformes monétaires d'Aurélien et de Dioclétien*, RN, 17 (1975), 73-138.

⁶ C.H.V. Sutherland, *RIC VI* (London 1967), 4-7 and 36-73; and M. Hendy, *Mint and Fiscal Administration under Diocletian, his Colleagues and his Successors*, 305-324, JRS, 62 (1972), 75-82. Heraclea (292/3), Treveri (ca. 293), Aquileia (ca. 294), Nicomedia (294/5), Carthage (296), and Thessalonica (298/9), to be transferred to Serdica between 303 and 308.

⁷ *RIC VI* (1967), 36-38. The *aurei* struck at Iantinum (Meaux) are exceptional; cf. K. Pink, *NZ*, 64 (1931), 37; and P. Bastien, *The Iantinum Mint*, ANSMN, 25 (1980), 77-85.

⁸ *RIC VI* (1967), 43-46.

⁹ *RIC VI* (1967), 54-65, with Heraclea, Thessalonica, and Serdica on one hand, and Nicomedia and Cyzicus on the other. The concentration of three mints on the Bosphorus underlines the military importance of the area; cf. P. Bruun, *The Successive Monetary Reforms of Diocletian*, ANSMN, 24 (1979), 129-48, esp. 130.

¹⁰ *RIC VI* (1967), 65-73, with Antioch and Alexandria. The mint of Alexandria issued local Greek coinage up to 295/6 and for some time in 297/8, before switching to the

organized along roughly the same lines as the administrative diocesan division.¹¹ However, peaceful areas, such as the Viennensis (in Southern Gaul) and the Spanish provinces (Hispaniae), harbored no concentration of troops, and therefore no mints, while strategically sensitive regions, such as Italy, Northern Gaul, and the East (Oriens), were better equipped than average. Minting remained the job of imperial procurators subordinated to a *rationalis summae rei*, also in charge of collecting taxes in monies, customs dues, *aurum coronarium* and *oblaticium*, *collatio lustralis* and *glebalis*.¹² Gold, silver, and base metals were supplied from taxes, confiscation, and compulsory purchases, mining being by that time rather subsidiary.¹³ Thus, minting can be described at that time as a flexible activity answering to the needs both of the empire at large and of smaller territorial administrative units, and directly related to territorial control.

Monetary system

As we come now to the coinage produced by these facilities, its components, and its historical development over the Tetrarchic period, let us remark that in 284, Diocletian inherited Aurelian's monetary system established in 274 and based on the following denominations:

- an *aureus* or gold coin struck at 50 to the pound of gold;
- a *neo-antoninianus*, a.k.a. *aurelianus*, struck at 84 to the pound of billon, perhaps heavier (3.8g), in any case finer (ca. 4-4.5% silver content) than the old *antoninianus* (3.7g with 3.5% silver), with a radiate head on the obverse and the mark XX.I on the reverse;¹⁴
- a fraction of the *aurelianus* (2.55g and ca. 1.5% silver) with a laureate head on the obverse and sometimes the mark VSV on the reverse;¹⁵
- copper coins without the mark SC (*as*, *dupondius*, *sestertius*).

production of imperial coinage. Cf. W.E. Metcalf, *From Greek to Latin Currency in Third-Century Egypt*, in H. Huvelin *et al.* (eds.), *Mélanges de numismatique offerts à P. Bastien*, Wetteren 1987, 157-68.

¹¹ M. Hendy, *JRS*, 62 (1972), 75-78.

¹² *RIC* VI (1967), 88-93; M. Crawford, *Finance, Coinage and Money from the Severans to Constantine*, *ANRW* II.2 (1975), 560-93, esp. 587; and J.-P. Callu, *La politique monétaire des empereurs romains de 238 à 311*, Rome 1969, 290-95.

¹³ A.H.M. Jones, *The Later Roman Empire, 284-602*, Baltimore, MD 1964, 435-36.

¹⁴ J.-P. Callu (1969), 323-29; M. Crawford, *ANRW* II.2 (1975), 575-78; K.W. Harl, *Coinage in the Roman Economy, 300 B.C. – A.D. 700*, Baltimore/London 1996, 143-48.

¹⁵ J.-P. Callu (1969), 328, n. 5.

The face value of the billon coins is not known for sure, perhaps 5 and 2 denarii (according to J.-P. Callu) or 2 and 1 (according to M.H. Crawford).

By the end of his reign in 305, Diocletian's coinage had gone through a number of reforms, the result of which is the following:¹⁶

- an *aureus* struck at 60 to the pound of gold (5.2-5.5g), with multiples and fractions, issued at all mints except Londinium, Lugdunum, Serdica, and Heraclea;¹⁷
- an *argenteus* or silver coin struck at 96 to the pound of silver (3.0-3.3g), according to the Neronian standard for silver *denarii*. This denomination was issued, probably in large quantities, at all mints except Londinium and Lugdunum (cf. below);¹⁸
- a *nummus* (sometimes mistakenly called *follis*) struck at 32 to the pound of billon (ca. 10.3g), with ca. 4% silver content. Issued at all mints, the *nummus* shows a laureate head on the obverse;
- a *neo-antoninianus* struck at 110 to the pound of mostly copper (with ca. .1-1.5% silver), showing a radiate head on the obverse. It was issued at all mints except Londinium, Lugdunum, Nicomedia, Serdica, and Thessalonica, while Cyzicus also produced a heavy variety of these (5.0-6.5g);¹⁹
- fractions of the *nummus* (220 to the pound, mostly copper), with laureate head on the obverse, minted at Alexandria (half *nummus*),²⁰ Rome, Ticinum, and Siscia.

While the radiate and laureate subdivisions of the *nummus*, though undergoing reduction in weight (from 84 to 110 to the pound) and debasement (from ca. 4-5% silver to ca. .1%), clearly continued the *aureliani*, they were issued on a much smaller scale than *nummi* because existing *aureliani* circulated well into the first years of the fourth century.²¹ Be that as it may, how could the monetary system change so

¹⁶ *RIC VI* (1967), 93-100; K.W. Harl (1996), 151, Table 6.6 (questionable, in my opinion); B. Rémy, *Dioclétien et la Tétrarchie*, Paris 1998, 79-84.

¹⁷ *RIC VI* (1967) *passim*.

¹⁸ *RIC VI* (1967) *passim*, esp. 45 (speaking of the output of the central group): «These silver coinages were probably much more voluminous than has often been supposed: the Sišak hoard has demonstrated what a single officina, expanded to two, could produce, and output from as many as seven officinae at Rome must have been very considerable.»

¹⁹ *RIC VI* (1967), 580; K.W. Harl (1996), 150-51.

²⁰ *RIC VI* (1967), 667.

²¹ J.-P. Callu (1969), 393-94; and M. Crawford, *ANRW II.2* (1975), 578. This is verified by hoard evidence, cf. *Coin Hoards I* (1975), nos. 209; 224; 226; 227; *ibid. II* (1976), nos.

drastically over less than a generation? Something very peculiar had undoubtedly happened, which has to be accounted for in terms of imperial policy with economic or political intent.

Monetary reforms and innovations

Clearly, Diocletian's monetary system had gone through a series of innovations and monetary reforms, datable to the period between 293/4 – or slightly before – and 301.²² The dating is based on various types of evidence. The *terminus post quem* rests on the presence of the first issue of *argentei* at Siscia and of *nummi* at Heraclea, both struck in the name of two *Augusti* only, therefore later than the introduction of the Dyarchy (285/286) and possibly earlier, albeit slightly, than the introduction of the Tetrarchy in 293.²³ The *termini ante quos* are more numerous: in addition to the inscriptions recording the Currency Reform and the Price Edict of 301, the numismatic and papyrological evidence suggests that both the *argenteus* and the *nummus* had been introduced in Egypt by the date of the revolt of Domitius Domitianus in 297/8 and the end of the Greek coinage at Alexandria.²⁴ Additionally, one issue of *nummi*, regarded as the earliest one in Egypt, is dated by its Greek numeral to the twelfth year of Maximianus or the fifth one of Constantius, starting Aug. 29th, 296. The reformed coinage in silver and billon started between ca. 293 and 296/7, but probably not in all mints at the same time. The two denominations seemingly did not follow the same pattern of development, and were probably triggered by different causes. However, the problematic relationship between nominal and intrinsic values compels us to delve a bit deeper into the greater history of Diocletian's coinage.

287 and 299; III (1977), no. 188; IV (1978), no. 158; V (1979), nos. 170-178; VI (1981), no. 167; VII (1985), nos. 307 and 310.

²² On the details (“date and scope”) of Diocletian's monetary reforms, cf. P. Bruun, ANSMN, 24 (1979), 131-34.

²³ *RIC* VI (1967), 459, no. 32a-b; and *RIC* VI (1967), 530, no. 12a-b. The *argumentum e silentio* is more convincing for the *nummus* than for the *argenteus*, the type of which shows elements that could be taken as a reference to the Tetrarchs (four persons sacrificing on the reverse); cf. P. Bruun, ANSMN, 24 (1979), 131-34.

²⁴ A. Geissen, *Numismatische Bemerkung zu dem Aufstand des L. Domitius Domitianus*, ZPE. 22 (1976), 280-86; and W.E. Metcalf, in *Mélanges P. Bastien* (1987). What is considered the earliest silver issue of Alexandria (*RIC* VI [1967] 661, no. 7a = Plate 1.16 in K. Pink, NZ, 63 [1930]) may show the features of Domitius Domitianus.

Metrology of Diocletian's coinage

The tariffing of denominations between 293 and 301 presents a tricky problem and consequently turns out to be a rather controversial topic. The cornerstone of any reconstruction is the inscription found in 1970 at Aphrodisias of Caria, the surviving fragments of which record parts of the text of an imperial constitution, the so-called Currency Edict, promulgated by Diocletian and his colleagues (probably with a cover letter) and calling for a retariffing of some or all existing denominations at double their face value, effective September 1st, 301.²⁵ Whereas it is difficult to see the advantage of a global measure affecting all denominations,²⁶ the inscription is clear about the post-Reform face value of the *argenteus* at 100 denarii, and the retariffing (“*geminata potentia*”) of another unspecified coin, probably the *nummus*, passing from – assumedly – 12.5 to 25 denarii, if the final *-ti* is to be supplemented as “[*vigin*]ti,” a restitution deemed inescapable for some scholars, and to be resisted for others.²⁷ But what happened to the other denominations?

As the inscription is preserved in several fragments, the first one and the third one (i.e. the previous and the following one) may have contained interesting information about larger and smaller denominations, respectively gold and billon (or copper). In addition, the central provision concerning payments of debts, though unfair because it worked to the advantage of creditors, especially the Roman state, must have been legally valid and economically sensible.²⁸ It states that debtors would have to repay their debts with coins rated at their new face value in contracts made after the promulgation of the Currency Edict, that is after September 1st, 301. But

²⁵ AE 1973, no. 526, first published by K.T. Erim - J. Reynolds - M.H. Crawford, *Diocletian's Currency Reform: A New Inscription*, JRS, 61 (1971), 171-77; new edition by J. Reynolds, in C. Roueché, *Aphrodisias in Late Antiquity*, London 1989, no. 230, pp. 252-65. Cf. now S. Corcoran, *The Empire of the Tetrarchs. Imperial Pronouncements and Government, AD 284-324*, Oxford 1996, 134-35, 177-78, and 213-15.

²⁶ S. Corcoran (1996), 178 comes to the same conclusion for a different reason, pointing out that “the existence of separate documents suggests that not all the coins were treated in the same fashion, and therefore that not all were doubled in values.” Cf. also *ibid.*, 214-15.

²⁷ K.T. Erim *et al.*, JRS, 61 (1971), 171-77 (cf. also M. Crawford, ANRW II.2 [1975] 582-83, suggesting to read “[*radia*]ti”), with the correction by S. Mazzarino, *Sull'epigrafe diocleziana di Afrodisiade BICHAECTAM: per l'interpretazione romana delle misure 'inflattive'*, in L. Gasperini (ed.), *Scritti sul mondo antico in memoria di Fulvio Grosso*, Rome 1981, 333-70, esp. 360-62.

²⁸ J. Guey, *Note sur la réforme monétaire de Dioclétien et le mutuum: l'inscription d'Aphrodisias de Carie*, BSFN, 27 (1972), 260-64.

for contracts entered into before that date, debtors were required to pay the amount with coins rated at their old face value. The nature and size of the debts that the legislator had in mind are unclear, thus providing no clue about the denominations possibly used in such transactions. Small laureate bronze coins may have been too small to be of any use,²⁹ but what about gold? M. Crawford suggested that *aurei*, *argentei* and possibly *nummi* were affected by the retariffing, thus leaving out the radiate bronze.³⁰ Consequently, for debts ranging in the hundred denarii, debtors would have exchanged their *argentei* and *nummi* at their new face value for *neo-antoniniani* at their old and unchanged face value, taking advantage of a – possibly intentional – loophole in the law and repaying in fact only half of what they owed. This would have had the accessory effect of demonetizing one or the other denomination if the Roman state was in either the position of exchanger or creditor (collecting taxes or rents, for instance).

By contrast, R.S. Bagnall suggested that perhaps all denominations but the *nummus* were left unchanged.³¹ What remains of the text makes such a hypothesis possible. It allows for a similar maneuver with similar consequences, though affecting only the circulation of the *nummus*, an economically substantial denomination by contrast with the radiate billon and the then still circulating *neo-antoninianus*. More recently, C. Howgego surmised that retariffing did not affect the *aureus*, which, as a result of Aurelian's reform in 274, "floated in value like any other commodity" while "the rest of the coinage system fell in value owing to debasement, being no longer pegged by its relationship to gold."³² And finally, K.W. Harl thought that all denominations except the bronze laureate had gone through a double retariffing, the first one in January of 300, the second on September 1st, 301.³³ I personally remain unconvinced by the idea of a double consecutive retariffing, of which I can find no evidence in the sources, and I consider that more is needed than the *status quo* for as small a denomination as the copper laureate coin in order to make an otherwise overall retariffing significant in monetary terms. Floating gold and, why not, stable silver denominations would provide a better yardstick to

²⁹ S. Corcoran (1996), 214-15.

³⁰ M. Crawford, *ANRW* II.2 (1975), 584-85.

³¹ R.S. Bagnall, *Currency and Inflation in Fourth Century Egypt*, BASP, Suppl. 5, New York 1985, 21.

³² C. Howgego, *Ancient History from Coins*, London/New York 1995, 125-26 and 132-33.

³³ K.W. Harl (1996), 152-54, with Table 6.6, 151, based on his article *Marks of Value on Tetrarchic nummi and Diocletian's Monetary Policy*, Phoenix, 39 (1985), 263-70.

measure the effect of retariffing. However, in view of possible rises in the price of silver bullion, it is tempting to envisage the retariffing of the *argenteus* from 50 to 100 *denarii* in order to circumvent the risk of its forthcoming or increasing undervaluation, thus making the old *antoniniani* and the *aureliani* the primary targets of demonetization.

Whatever the solution, it almost necessarily implies that the law tried to induce debtors to use some specific denominations in lieu of others. Gold coins, being used practically like bullion, must have played a subsidiary role in common, daily transactions. Only substantial overvaluation of coins can ensure that rises in prices affecting precious metals do not result in driving coins into hoards or into the melting pot.³⁴ From the maximum prices indicated in the Aezani copy of Diocletian's Price Edict³⁵ – possibly lower or higher³⁶ than market prices – the ratio of gold to silver bullion is 12 to 1 (respectively 72,000 and 6,000 *denarii*). The intrinsic value of Diocletian's *argenteus* struck at 96 to the pound was therefore 62.5 *denarii* or more, lower than its post-Currency Edict face value (100), but close to, and possibly higher than, its pre-Currency Edict face value – provided that it was different – unless the price of silver bullion had drastically increased over the fall of 301, a hypothesis that can neither be confirmed nor categorically disproved. In any case, it is likely that the overvaluation of Diocletian's silver coinage before the retariffing was no longer sufficient to cover the cost of minting and to avoid its gradual disappearance.³⁷ This may have been the case from the inception of the silver coinage, as shown by its early hoarding and its low rate of survival.³⁸

³⁴ C. Howgego (1995), 128-30, on the difficulty of estimating rates of overvaluation of Roman coinage. He suggests (p. 129) however that “the silver *argenteus* and billon *nummus* ... seem to have been valued at 1.6 and 2.85 times their bullion contents respectively (i.e. were overvalued by 60 per cent and 185 per cent).” Do these figures amount to more than an educated guess?

³⁵ M. Giaccherio, *Edictum Diocletiani et collegarum de pretiis rerum venalium*, I, Genova 1974, 28.1a-2 and 28.9. Cf. also J. Reynolds, in C. Roueché (1989), no. 231, 265-318, esp. 297 (ch. xxviii.1a-2), with S. Corcoran (1996), 178-79, no. 11, and 205-33.

³⁶ J.W. Ermatinger, *Diocletian's Economic Revolution*, MBAH, 9 (1990), 45-49, esp. 47, estimates that prices in the Price Edict are ca. 30-50% higher than market prices. If this hypothesis were true for the price of silver bullion, the *argenteus* would have had an intrinsic value of 31.25-43.75 *denarii* for a nominal value of 100!

³⁷ For sensible calculations of metallic and face values of Diocletian's post-Currency Reform coinage, cf. L.H. Cope, *Diocletian's Price Edict and Second Coinage Reform in the Light of Recent Discoveries*, NC, 137 (1977), 220-26.

³⁸ *RIC* VI (1967), 330; and J.-P. Callu (1969), 391-92.

Diocletian's silver coinage

Diocletian's gradual monetary reform from 293 on was remarkable for its attempt to reintroduce a pure silver denomination.³⁹ It is common knowledge that silver was rather scarce at that time, especially in the central and eastern part of the empire, perhaps even more so than gold. In addition, the Roman state and economy had been able to get by for three quarters of a century with a debased silver coinage, and the contemporary introduction of the *nummus*, at a better standard and fineness than both the old *antoninianus* and the more recent *aurelianus*, would have been in itself a major monetary achievement. Both denominations, *argenteus* and *nummus*, could serve the same economic purpose. It is not clear whether the new *argenteus* was supposed to play a subsidiary role, in a system dominated by the *aureus* and the billon *nummus*, or whether *argenteus* and *nummus* were introduced in order to replace gold and bronze denominations.⁴⁰ The question remains: why did Diocletian and/or his colleague Maximianus decide to issue a pure silver coinage under these circumstances? One solution to this paradoxical fact may be that the emperor(s) used a rather daring monetary policy for a very specific political reason.

Diocletian's silver coinage was introduced ca. 293/4⁴¹ and its early history is known mostly through the so-called Sišak Hoard, buried ca. 295/6 according to Jeločnik on the basis of the degree of wear. It shows that by this time the imperial mints located at Treveri, Ticinum, Rome, Siscia and Heraclea had been issuing silver coins for some time.⁴² Jeločnik rightly

³⁹ K. Pink, *Die Silberprägung der Diocletianischen Tetrarchie*, NZ, 23/63 (1930), 9-38, relying on 535 coins (Alexandria = 12; Antiochia = 39; Aquileia = 20; Carthago = 21; Cyzicus = 10; Heraclea = 24; Nicomedia = 31; Rome = 168; Serdica = 6; Siscia = 0; Ticinum = 25; Thessalonica = 28; and Treveri = 101); A. Jeločnik, *The Sišak Hoard of argentei of the Early Tetrarchy*, Situla 3 (1961), 39-69, based on 1,415 coins; RIC VI (1967); and P. Bruun, ANSMN 24 (1979), 134-48.

⁴⁰ K.W. Harl (1996), 149-50 seems to hesitate on this issue by proposing both schemes one after the other. At least, the functional importance of the *nummus* is obvious, quantitatively and qualitatively (150 and 152).

⁴¹ Pace J.-M. Carrié, in J.-M. Carrié - A. Rousselle, *L'Empire romain en mutation des Sévères à Constantin, 192-337*, Paris 1999, 196, who obviously extrapolates from the now accepted date of the reform in Egypt to the rest of the empire. Cf. mostly, P. Bruun, ANSMN, 24 (1979), 134-48 (essential).

⁴² The Sišak Hoard (1,415 coins in total) contains *argentei* from Siscia, Rome, and Ticinum in large numbers, and from Heraclea and Treveri in smaller quantities: Siscia = 533 coins (37.7%); Rome = 529 coins (37.4%); Ticinum = 333 (23.6%); Heraclea = 14 coins (1%); Treveri = 4 coins (.3%); cf. A. Jeločnik, Situla, 3 (1961), 42.

underlined the fact that right from its inception this new silver coinage was issued in great quantities, circulated widely, and met with great success as shown by the timely appearance of forgeries.⁴³ Judging by reverse types, it can be arranged in three groups, the earliest of which shows four people (assumedly the Tetrarchs), sacrificing over a tripod in front of an archway in an eight- or six-turreted enclosure. The legend on the reverse reads VIRTUS MILITVM or VICTORIA SARMAT(ica) (celebrating any of victories over the Sarmatians in the early 290s) or PROVIDENTIA AVGG. Within this group, an early, unsigned issue was struck at Siscia in the name of the two Augusti only, in a single *officina*.⁴⁴ After a while, the two Caesars were included and the coins minted in two *officinae*, one for Diocletian and Constantius, the other for Maximianus and Galerius (*ibid.*, linked by reverse dies). This pattern is not found elsewhere. Remarkably, the very few coins from Treveri found in the Sišak Hoard belong to the third series of the first issue, and bear the *officina*-mark 'C' and 'D', transferred, according to P. Bastien, from Lugdunum to Treveri in early 294, which suggests that the mint at Treveri started minting *argentei* already in 293.⁴⁵ Around the time of the burial of the Sišak Hoard or soon after, Carthage (FEL ADVENT), Cyzicus, Nicomedia, Antioch, and Alexandria started striking *argentei* with the same reverse type. Before long, a second type was adopted, representing a camp-gate with four turrets. Around that time, Treveri, Heraclea, and Cyzicus had stopped issuing silver coinage, while Rome, Antioch, and Alexandria had merely interrupted it. Ticinum, Aquileia, and Carthage were producing their last silver issue, with the reverse mark XCVI. Siscia and Nicomedia then proceeded with the second type, while a new mint started at Thessalonica. With the inception of the third type, featuring a camp-gate with only three turrets, Rome, Antioch, and Alexandria resumed their silver coinage while Nicomedia stopped it. Siscia persisted and Thessalonica was transferred again to Serdica. After 305, silver was minted only at Treveri, Aquileia, Ticinum, Rome, Carthage (a mint soon transferred to Ostia), and Serdica. This reconstruction of the history of the Tetrarchic silver coinage reveals an almost simultaneous start at Siscia and Treveri, and a progressive development eastwards.

⁴³ A. Jelocnik, *Situla* 3 (1961), 64-66.

⁴⁴ *RIC* VI (1967), 459, n. 1.

⁴⁵ P. Bruun, *ANSMN*, 24 (1979), 137, and n. 27, citing P. Bastien, *Le monnayage de l'atelier de Lyon, 285-294*, *Numismatique romaine* 7, Wetteren 1972, 75.

It is important to note that this eastward development of silver coinage runs contrary to the expansion of the other denomination created by Diocletian to perform a similar economic role, the *nummus*. Introduced first at Heraclea in the Balkans, it radiated from its place of origin to reach Egypt only in 296/7. Suffice it to say that *argentei*, *nummi*, and *neo-antoniniani* were supposed to circulate side by side, and that the monetary reform of 293/4 was achieved in several steps, with different schemes, and possibly for different reasons. Decisions were made by the Augusti where they were staying, and their monetary policy was conditioned as much by political and military considerations as by commercial needs. The example of Treveri, where silver coinage was issued continuously as long as the British and German crises were not settled, is telling. As Callu pointed out (cf. below), the rationale for Diocletian's silver coinage is to be found in the events that affected the Northwestern part of the empire soon after Diocletian's accession to the imperial dignity. This is what we will be focusing upon from now on.

The episode of Carausius

Between 286 and 293, the usurper Carausius,⁴⁶ a Menapian formerly in the service of the legitimate emperor Maximianus, controlled Britain and Northern Gaul and struck coins in various metals before being murdered by his finance minister Allectus, obviously a man important enough to claim his succession.⁴⁷ As Carausius could supposedly rely on a better supply of

⁴⁶ On Carausius' coinage, cf. P.H. Webb, *RIC* V.2 (1933), 426-556; R.A.G. Carson, *The Mints and Coinage of Carausius and Allectus*, *JBAA*, 22 (1958), 33-40; idem, *The Sequence-marks of the Coinage of Carausius and Allectus*, in R.A.G. Carson (ed.), *Mints, Dies and Currency. Essays in Memory of A. Baldwin*, London 1971, 57-65; N. Shiel, *The Episode of Carausius and Allectus: The Literary and Numismatic Evidence* (BAR 40), Oxford 1977; *Studies in the Coinage of Carausius and Allectus*, London 1985 = *British Numismatic Journal*, 54 (1984), 1-50; H. Huvelin, *Note sur le monnayage de Carausius à la marque RSR*, in M. Christol et al. (eds.), *Institutions, société et vie politique dans l'Empire romain au IV^e siècle ap. J.-C.*, CEFR 159, Rome, 1992, 171-81 (with additional specialized bibliography); E. Besly, *Carausian denarii: Some New Discoveries*, in M. Price - A. Burnett - R. Bland (eds.), *Essays in honour of R. Carson and K. Jenkins*, London 1993, 223-27; and P.J. Casey, *Carausius and Allectus: The British Usurpers*, London 1994, who points out (p. 88) that Allectus and Carausius can be credited with some important innovations in Roman coinage, for instance the rational and systematic use of mintmarks and control symbols, adopted widely thereafter.

⁴⁷ X. Lorient, *La carrière d'Allectus jusqu'à son élévation à la pourpre*, in M. Christol et al. (eds.), *Institutions, société et vie politique dans l'Empire romain au IV^e siècle ap. J.-C.*, CEFR 159, Rome 1992, 161-69.

silver bullion – from mines in Britain⁴⁸ – than the legitimate emperors, and as he was undoubtedly suffering from a shortage of gold, he minted silver coins on a small scale at Londinium, Camulodunum ('C' mint),⁴⁹ and Rotomagus (Rouen),⁵⁰ and on a larger scale at an unidentified mint, possibly Rutupiae (Richborough) rather than Gesioracum (Boulogne).⁵¹

Although the small number of extant coins and the too scarce evidence of hoards impede the precise and accurate arrangement and dating of Carausius' silver coinage, N. Shiel has shown that it can be divided into two groups, the larger one with the mark RSR in the exergue, and the smaller one, perhaps prior to the other one, with no mark. In addition, some coins bear letters commonly found on *antoniniani*. While Shiel's catalogue includes only ca. 147 coins, it does not mean, against a commonly held opinion, that this coinage was issued in small quantities, as 114 obverse dies and 127 reverse dies have been identified.⁵² Shiel suggested that Carausius' silver coinage was minted at the beginning of his reign as a donative for his soldiers, instead of gold. However, a later date for such donatives – if this was actually the occasion – would also be possible, to commemorate either his victory against Constantius in 289 or his

⁴⁸ *Pan.Lat.* 4.11.1: "tot metallorum fluens rivis"; cf. J.-P. Callu (1969) 356, n. 4; H. Huvelin (1992) 179, and n. 24, citing R.A.G. Carson, *Roman Coinage Metal and Coin Production*, Quaderni Ticinesi, 10 (1981), 301-302 (*non vidi*); and E. Besly (1993), 226, n. 20, citing as provenance, besides Carausius' loot, "native sources such as the Mendip lead-silver mines which may well still have been in operation at this time."

⁴⁹ The location is still disputed, cf. most recently S. Bendall, *The C Mint of Carausius and Allectus. Camulodunum or Clausentum?*, Numismatic Circular, 105.7 (1997), 240-41; and C.D. Lloyd, *The C Mint of Carausius and Allectus*, BNJ, 68 (1998), 1-10.

⁵⁰ Respectively, *RIC* V.2 (1933), nos. 7-9; 186-187; and 625-626 (RSR thought to be a local imitation?!). Cf. R.A.G. Carson (1971), 63.

⁵¹ Cf. P.H. Webb, *RIC* V.2 (1933), and N. Shiel (1977) for the first hypothesis, and R.A.G. Carson, *JBAA*, 22 (1958), 33-40 for the second one, somewhat qualified in idem (1971), 57-65. While rejecting Boulogne as the source of those unmarked coins, P.J. Casey (1994), 78 remains uncommitted.

⁵² H. Huvelin (1992), 171 (counting 81 obverse dies and 87 reverse dies for 106 coins with RSR mark), and *pace* N. Shiel (1977), 94-144, esp. 138: "The small number of denarii which has survived seems to indicate that they were never very plentiful (...) otherwise more would have survived" (my emphasis). I basically agree with E. Besly (1993), 225 who, after pointing out the combination of the large number of dies and single specimens and the scarcity of die links, suggests that many dies remain to be discovered and concludes that "the image of Carausian silver as a small issue needs to be reconsidered. It could potentially represent a considerable issue which, like the gold coins of the British Empire, was speedily and efficiently suppressed following the Constantian reconquest. Against this notion is the largely negative hoard evidence (...)" although his last objection can be escaped, as will be shown below.

quinquennium in 290. A late date for this silver coinage could also rest on what is more significant in my view, the basis of some shared dies with later *aurei*.⁵³

All students of Carausius' silver coinage have been struck by the low rate of survival of these coins. The hoard evidence is rare in Roman Britain, and almost absent on the Continent, and even then, Carausius' *denarii* are usually few in number among other coins.⁵⁴ Where did these silver *denarii* go after leaving the mint? An attractive solution would be to Diocletian's and Maximianus' melting pot.⁵⁵ From 286 to 293, Carausius' silver coinage filled a monetary vacuum in that part of the empire. His *argentei* were struck at 84 or 90 to the pound, weighing about 3.9g or 3.75g,⁵⁶ for an unspecified – thus unknown to us – face value. As Callu once suggested,⁵⁷ Diocletian's monetary reform ca. 293/4 took into account the existence of this quality coinage, and followed suit with slightly lighter *argentei*, struck at 96 to the pound, either to restore the Neronian standard or because silver bullion was too scarce. The difference in weight is ca. .5g, too little to be noticed without the help of a scale, but not big enough to call for a different face value, especially if the silver coinage was sufficiently overvalued in relation to its metallic content at the time of minting. Assuming on the basis

⁵³ N. Shiel (1977), 95, no. 1. Cf. also some alleged similarities between silver coins and unmarked *aurei* with the legend VOT V MVLX. A 'C' read in the obverse legend might refer to Carausius assuming the title of Caesar after his *quinquennium*.

⁵⁴ N. Shiel (1977), 39-93, esp. 49, no. 42 (Strata Florida: 15 *antoniniani* from Gallienus to Claudius II and 1 *denarius* of Carausius in "very good condition", an association deemed "most unusual"); 51, no. 49 (Wroxeter: 12/13 *antoniniani* from Philip to Postumus and 4 *denarii* of Carausius, "of which three were badly burned"); 54, no. 10 (Holt: 1,105 coins = 42 silver and 1,063 bronze, 9 (silver or bronze?) of Carausius, and 1 of Diocletian); 55, no. 12 (Olney, ?); 65, no. 21 (Sully Moor: 301 coins, of which 7 were later gold coins, and the rest silver coins from Marcus Aurelius to Carausius = 1 coin); 68-69, no. 10 (Rouen: ca. 400 small bronze denominations, of which 210 of Carausius and 3 *denarii*); and 143-44 (distribution maps of silver coins from known provenances). Cf. also E. Besly (1993), 226-27, noting that Carausian *denarii* were found not only in military camps, but also in major and minor towns, and that they may have had a wider (though not longer) circulation than is usually assumed, as "many surviving specimens show considerable signs of wear, though poor striking or preservation may partly account for this, since their lifetime in circulation is likely to have been short."

⁵⁵ C.J. Bailey, *Some Notes on the Coinage of Carausius*, Numismatic Circular, 89,10 (1981), 321-22, esp. 322, n. 3: "The paucity of Carausian coinage from Boulogne and Northern Gaul points not only to limited coin circulation, but the possibility of efficient retrieval of a usurper's currency. Consequently it would be erroneous to place too much emphasis on the lack of coin evidence in Gaul, in any attempt to determine the continental holdings of Carausius and Allectus."

⁵⁶ P.J. Casey (1994), 96 for the lower weight; N. Shiel (1977), 140 for the higher one.

⁵⁷ J.-P. Callu (1969), 356-57; followed by N. Shiel (1977), 138.

of the interpretation of the Currency Edict a face value of either 50 or 100 denarii for both Carausius' and Diocletian's *argenteus*,⁵⁸ Gresham's Law, which I will come to in a moment, was bound to apply.⁵⁹

Two factors may have exacerbated the phenomenon: first, the rate of overvaluation of coins depends on the fluctuating price of bullion. As everyone knows, prices fluctuate in time and space. Thus, in a period of inflation and rising prices, the longer coins with a high metallic content circulate, the higher their metallic value increases and the smaller their rate of overvaluation decreases. The same is true for coins circulating further and further away from the sources of supply of precious metal. The relative plentifulness of Carausius' silver supply from mines in Roman Britain may have ensured a lower price than elsewhere further east where silver was scarce. In that regard, Diocletian's *argenteus*, with ca. 10-12 percent less silver than Carausius' to start with,⁶⁰ saw its rate of overvaluation decrease more slowly, thus forcing the latter to the melting pot before joining it itself, had not the duplication of its face value – if it really occurred for the *argenteus* – somewhat postponed its own demise. The second factor was of course the inclination of the imperial administration to collect taxes and rents in bullion, silver or gold.⁶¹

⁵⁸ P.J. Casey (1994), 86 speculates that Carausius' silver denomination was worth 70 denarii. His calculations are based on a coin at 90 rather than 84 to the pound, and upon the price of silver in 301 known from the Aezani copy of Diocletian's Price Edict (6,000 denarii), acknowledged by all as artificially low. However, it is likely that the price of silver increased drastically over 13 years in a period of inflation, making a lower face value more likely. Since the market price of silver in 286/7 and the rate of overvaluation of Carausius' coins are unknown, certainties cannot be reached on the question of face value. For the sake of comparison and for what the hypothesis of a double retariffing is worth, K.W. Harl (1996) 149 considers that Diocletian's *argenteus* was initially tarified at 25 denarii, and doubled twice (Jan. 300 and Sept. 301).

⁵⁹ H. Huvelin (1992), 175 thus explains Carausius' decision to stop minting *denarii*: «Quant à la cessation de la frappe, que celle-ci ait eu lieu au début ou au milieu du règne, elle s'explique facilement. La mauvaise monnaie chassant la bonne, les pièces de bon aloi ont dû être immédiatement retirée de la circulation (n. 15: Plutôt pour être refondue que thésaurisées sans doute, car on ne connaît pas de trésor important constitué de monnaies d'argent), ce qui a contraint Carausius à renoncer à leur fabrication....» What she considers "bad money" (*neoantoniniani? aurei?*) is not clear to me, but cannot be Diocletian's *argentei*, because of the chronological gap (at least three or four years). Cf. B. Rémy (1998) 83, pointing at the *neoantoniniani* as the cause of the withdrawal of *aurei*, *argentei*, and *nummi*, and of the eventual Currency Edict.

⁶⁰ Although the degree of fineness may have been higher for Diocletian's *argentei* than for Carausius' *denarii*, cf. H. Huvelin (1992), 179-81, insofar as her sample (5 *denarii* and 2 *argentei*) is statistically significant. *Contra*, cf. B. Rémy (1998) 81 (*argenteus* = "titre d'argent fin de seulement 80%"), with no bibliographical reference or primary evidence.

⁶¹ J.-M. Carrié (1999), 198-201 (with ancient literary and papyrological sources), 203, and 205; and B. Rémy (1998), 80.

Gresham's Law

Gresham's Law, wrongly attributed in the nineteenth century to a sixteenth-century British merchant, financier, and exchange specialist,⁶² observes that "bad money drives out good," meaning that in a system where two currencies circulate side by side without retaining in both cases a perfect equality between face value, imposed by law, and metallic value, defined by the market (the law of supply and demand), the more overvalued currency (i.e. the "bad" one) drives out of circulation the less overvalued or possibly undervalued currency (i.e. the "good" one), which is then used for external payments, hoarding, and/or melting down for use as bullion or reminting as a different denomination in terms of weight, fineness, or face value. The effect is of course mitigated by significant overvaluation and economic conditions that confer fiduciary status to both currencies.⁶³ Gresham's Law is commonly linked to the explanation for the failure of bimetallism in post-medieval mercantilism, but was admittedly formulated earlier. N. Copernicus in his *Tractatus de monetis* or *De aestimatione monetae*, written ca. 1522, words it as follows:

Cum autem minime conveniat novam ac bonam monetam introducere antiqua viliore remanente, quanto hic magis erratum est vetere meliore remanente viliorem novam introducendoque non solum infecit antiquam, sed, ut ita dicam, expugnavit.⁶⁴

⁶² R. de Roover, *Gresham on Foreign Exchange: An Essay on Early English Mercantilism with the Text of Sir Thomas Gresham's Memorandum for the Understanding of the Exchange*, Cambridge, MA 1949, 91-94, on how H.D. MacLeod wrongly ascribed the law to Gresham in his *Elements of Political Economy*, London 1857/1858, 477, cited again in his *History of Economics*, New York 1896, 38, while acknowledging earlier statements of it by N. Oresme and N. Copernicus, shortly before Humphrey Holt in his *Discourse on the Common Weal* (1551), Gresham's likely inspiration ca. 1560; cf. J. Chown, *Gresham's Law*, *Numismatic Circular*, 99,3 (1991), 82-83 (for the date). Cf. also H. Bull, *Gresham's Law*, *The Whitman Numismatic Journal*, 3,1 (Jan. 1966), 65-67, for a witty caveat against misapplied analysis of Gresham's Law. I have not seen G. Beals, *Bad Money Drives Good Money Away*, *Coin World*, 185 (Nov. 1963), 32.

⁶³ This could explain why Carausius' *aureliani*, which lacked a silver content, are found in hoards together with regular *aureliani*; cf. P.J. Casey (1994) 72. Other instances of the same kind in C. Howgego (1995), 130, as proof of overvaluation.

⁶⁴ Cf. M.L. Wolowski, *Traicté de la premiere invention des monnoies de Nicole Oresme, textes français et latin d'après les manuscrits de la bibliothèque impériale et Traité de la monnaie de Copernic, texte latin et traduction française*, Paris 1864, 56; and J.-Y. Le Branchu, *Ecrits notables sur la monnaie*, Paris 1934 (*non vidi*).

However, there are good reasons to think that so-called Gresham's Law may have been understood, or even formulated, much earlier. The oldest trace of it has been found in Aristophanes' *Frogs*, written in the late fifth-century (405 B.C.), not that long after the introduction of coinage in the Mediterranean world:⁶⁵

Chorus

Many times it seems to us the city has done
 the same thing with the best and the brightest of its citizens
 as with the old coinage and the new gold currency.
 For these, not counterfeit at all,
 but the finest it seems of all coins,
 and the only ones of the proper stamp, of resounding metal
 amongst Greeks and foreigners everywhere,
 we never use, but the inferior bronze ones instead,
 minted just yesterday or the day before with the basest stamp.
 So too the citizens whom we know to be noble and virtuous,
 and righteous and true men of quality
 and trained in the palaestra and dancing and music,
 these we despise, but the brazen foreigners and redheads
 worthless sons of worthless fathers, these we use for everything,
 these latest parvenus, whom the city before this
 wouldn't have lightly used even for random scapegoats.
 But now, you dimwits, change your ways,
 and employ the good ones again. And if you succeed,
 it's praiseworthy. But if you stumble, at least you'll hang from a respectable
 tree—
 So wise men will think, if anything happens to you.

Since it is introduced by the playwright for the sake of comparison to illustrate the respective roles and social positions of 'good' and 'bad' citizens in Athenian democracy, it sounds like it belonged to the stock of common knowledge among mildly educated people. My point is not to suggest that Diocletian, his colleagues or their staff were avid readers of classical Greek plays, but that anybody who would be called upon to make decisions about monetary policy in ancient Rome would be vaguely

⁶⁵ Aristophanes *Ranae* 718-737 (transl. M. Dillon). Cf. L.E. Price, *A Note on Gresham's (?) Law*, *The Numismatist*, 73,5 (May 1960), 569-70; and G. Tozzi, *Economisti greci e romani*, Milan 1961, 33-34, with undue scepticism resting on the *argumentum e silentio* that Aristophanes does not explicitly speak of a law that would universally apply.

acquainted with the mechanics of concurring/competing currencies. In addition, the economic context of rising prices, the alleged renunciation of bimetallism since Aurelian's reform, and the low and ever decreasing rate of overvaluation of Carausius' and Diocletian's silver coinages during the 290's provide more than adequate conditions for Gresham's Law to work.

Conclusion

In conclusion, we may have reasons to think that Diocletian's (or Maximianus') decision to strike at 96 to the pound was not just the expression of "a conservative moral desire to return to older and better standards,"⁶⁶ but was intended as a response to Carausius' standard of 84 or 90 to the pound. Even though silver coinage was more expensive to produce than billon, the demonetization of a rival's successful and attractive coinage loaded with a sophisticated and ideologically diverse message⁶⁷ may have been regarded as a monetary and political priority. The device may have already been tried two decades earlier by Aurelian in order to eradicate the coins issued by Vaballathus and Zenobia, though with less success.⁶⁸ It could also be argued that the periodic debasement of *antoniniani* over most of the third century was resorted to as much for economic or fiscal necessity as for political expediency. Let me quote here a few statements to this effect by a leading expert in ancient monetary policy:⁶⁹ "As successive debasements between 242 and 253 reduced the antoninianus to a billon coin, Antonine and Severan denarii disappeared into hoards or the melting pot" or: "For two decades, each emperor from Trajan Decius to Claudius II lowered the purity of his antoninianus and thereby condemned the money of his predecessor to the melting pot." The same author also draws attention to situations of competition between imperial and civic coinages and to the symptomatic case of coin circulation in the Alps area, where two mutually exclusive zones of circulation seem to have existed side by side, with better Gallo-Roman *antoniniani* being hoarded north of the Alps, while Gallienus' more debased coinage circulated south of the Alps. Others have observed Gresham's Law at work

⁶⁶ C. Howgego (1995), 121.

⁶⁷ P.J. Casey (1994), 55-69, esp. 58-59, with conspectus of types.

⁶⁸ W.E. Metcalf (1987), 161, n. 12, and 168, Table II.

⁶⁹ K.W. Harl (1996), 129; 131; 136; and 145.

in different periods, for instance on the basis of export of better coins outside the empire (India, Britain, and Baltic area).⁷⁰

While debasement of *antoniniani* allowed minting authorities to save on scarce and expensive silver and to benefit in the short term from the delayed adjustment of prices, it also had the interesting long-term effect of suppressing the all too visible traces of the embarrassing claim of legitimacy and sovereignty of a discarded predecessor. The example was not lost on Diocletian. The irony is that his *argenteus* might have fallen victim of the same phenomenon shortly after 305, hoarded in the West and recoined as Sassanid dirhems in the East,⁷¹ not least because of the pressure exerted by the inferior *nummus* when both denominations ended up serving the same economic purpose.⁷²

⁷⁰ L. Lind, *Some Remarks on Roman Imperial Coinage and Gresham's Law*, in Amal Kumar Jha – Danjay Garg (eds.), *Ex Moneta: Essays on Numismatics, History and Archaeology in Honor of Dr. David W. MacDowall*, New Delhi 1998, 103-18, stressing the slow effect of Gresham's Law in the late first century A.D. For the sake of comparison in more recent history, cf. G. Hennequin, 'Bonne' ou 'mauvaise' monnaie? *Mutations monétaires et la loi de Gresham avant l'époque moderne*, *L'information historique*, 39,5 (Nov.-Dec. 1977), 203-12; R. Yates, *Gresham Was Right*, *Coins Magazine*, 25,1 (Jan. 1978), 54-58 about the disappearance of early American gold coinage due to Treasury Secretary A. Hamilton's miscalculation of ratio of gold to silver while foreign coins were still in circulation and accepted as a legal tender in the USA. Switzerland had a notorious brush with Gresham's Law in 1968, cf. C. Martin, *La Suisse redécouvre la loi dite de Gresham*, *Schweizer Münzblätter*, 71 (Aug. 1968), 101-04, with earlier local evidence in the sixteenth and seventeenth centuries.

⁷¹ K.W. Harl (1996), 161.

⁷² C. Howgego (1995), 119, underlining the fact that Diocletian meant both denominations as separate categories. An alternative explanation is proposed by G.L. Duncan, *Coin Circulation in the Danubian and Balkan Provinces of the Roman Empire, A.D. 294-578*, London 1993, 59-60, who knows of only one additional hoard in that part of the empire, found at Lesce (Slovenia) including 50 Tetrarchic *argentei* and 800 *nummi* (AE?), mostly from the mint located at Siscia and dated 293-305: «It would be tempting to take one effect of the 301 Coinage Edict as having been the doubling of the value of the follis (*sic*) in relation to the pure silver denomination (cf. *Bagnall's interpretation, above*). The consequence of this would have been that the *argenteus* will have been less attractive, since less profitable, for the authorities to strike and more attractive to hoarders. Quite apart from the plausibility of this in the reconstruction of the text of the Edict, it will provide an explanation of the relationship between these three facts: 1. The intense striking of the silver coin between 294 and 301. 2. The low rate of its striking after 301, especially in the east. 3. Its scarcity among finds and its virtual absence from hoards known to close after 301.» The evidence of the Lesce Hoard supports Duncan's statement (60) that «*argenteus* and *nummus* could circulate and be hoarded side by side.» For the hoard evidence of Diocletian's *argentei*, cf. J.-P. Callu (1969), 389 and 391, n. 2 (Sišak, Krempelstein, Brigetio, North Italy).