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From the Seventh through the Fifteenth Century

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Part Five
Economic Institutions and the State

Byzantine Money: Its Production and Circulation

Cécile Morrisson

> Δύο τοίνυν τούτων τὴν Ῥωμαίων συντηρούντων ἡγεμονίαν, ἀξιωμάτων φημὶ καὶ χρημάτων, καί τινος ἔξω τρίτου, ἔμφρονος περὶ ταῦτα ἐπιστασίας καὶ τοῦ λογισμῷ χρῆσθαι περὶ τὰς διανεμήσεις.
>
> Michael Psellos, *Chronographie,* ed. Renauld, 1:132

The two pillars of Byzantine rule (dignities and riches) celebrated by Michael Psellos at the beginning of his lengthy exposition concerning Constantine Monomachos and his prodigal ways, which he considered with hindsight to have started the crisis that came at the end of the eleventh century, are only the two sides of one and the same source of power: wealth. This wealth was distributed to those who held dignities and offices and was stored in the imperial treasury mainly in monetary form, although some types of silk and other luxury items, the product of imperial monopolies or workshops, served to complement and sometimes substitute for imperial payments. In other words, they were quasi-money.[1]

In any case, coinage may be considered the basic form of money in Byzantium, given the relatively limited role played by credit. Credit certainly existed: archival documents, papyri and *praktika,* and literary sources show how it developed during the sixth and seventh centuries (consumer credit, of course, as well as some forms of credit transfer implying delays in payment), persisted during the middle Byzantine period (e.g., maritime loans), and increased in scope from the thirteenth century on.[2] Both banking and bankers, and Byzantine businessmen in general, were not as primitive as has sometimes been implied and were able to take on the not inconsiderable role of granting credits to individuals and, possibly, the state, on the occasion of tax collection. Thus Patrikiotes, who made a fortune as a tax collector, was able to place 100,000 hyperpyra and movable goods to the value of 40,000 hyperpyra at John Kantakouzenos' disposal in 1341, to "complete and even increase the fiscal resources destined for

This chapter was translated by Sarah Hanbury Tenison.

[1] See below, 943.

[2] See, for instance, *POxy* 1908, line 17 (6th or 7th century), *POxy* 2010, line 1 (618); G. Dagron, "The Urban Economy, Seventh–Twelfth Centuries," *EHB* 434–38; N. Oikonomides, *Hommes d'affaires grecs et latins à Constantinople* (Paris, 1979), 54–68.

the campaign."[3] However, these "money-men" were not in a position to effect a significant increase in the monetary mass or the velocity of coin circulation. Thus we cannot speak of bank money, which is scarcely surprising, given that it developed late in the European economies as well.[4]

Consequently the predominance of coinage, in Byzantium as in the other medieval economies, entailed a certain lack of flexibility in the adjustment of the supply to the demand for means of payment. Nevertheless, thanks to its experience inherited from the Roman tradition and to a degree of sophistication in its financial acumen (though we should be wary of attributing to the Byzantines the will and ability to conduct what we would call monetary policy);[5] the Byzantine Empire was capable of making a durable monetary system function for more than a thousand years, from Constantine to 1453, and *a fortiori* during the nine centuries considered here, because of its relative flexibility. The transformations to this system enabled it to adapt, to some extent, to a context that was evolving in response to numerous negative factors (such as political and military events involving increased expenditure, the loss of tax returns and, possibly, of access to sources of precious metals) as well as positive ones (conquests that secured increased resources, treasure, followed by tribute and mineral products, periods of peace that provided security and favored a degree of growth) and, finally, that was influenced by international monetary movements. In fact, money was both product and instrument of a complex and developed financial and fiscal organization that made a powerful contribution to the economic integration of a huge territory, as it had done in the Roman period, as well as enabling a minimum of exchanges to persist even during the darkest periods of the empire's history.

I begin by examining matters connected with the money supply, meaning the conditions of its production and the evolution of the Byzantine monetary system, as well as its relations with contemporary coinages and, in the second part, issues relating to demand, meaning the elements and evolution of the circulation of money, the degree of monetization, as well as the internal and external diffusion of the coinage. This particular line of inquiry is not anachronistic, provided every variation and restriction imposed by the historical context and the way it evolved is brought to bear on the analysis. I have tried to do this, while asking the reader to bear in mind that what follows applies, *mutatis mutandis,* within a medieval environment. As John Hicks has emphasized, economics can supply a vision of the logical processes at work in history,

[3] *Ioannis Cantacuzeni eximperatoris Historiarum libri quattuor,* ed. L. Schopen, 3 vols. (Bonn, 1828–29), 2:59, 62 (III. 8) (hereafter Kantakouzenos): ταῖς ἐκ τῶν δημοσίων ἀποτεταγμέναις αὐτοῖς προσόδοις τὰ ἐλλείποντα ἀναπληρῶν ἢ καὶ προστιθείς.

[4] Bank money (scrip) played a very limited role for a long time in modern economies; it only developed in France, for example, in the mid-19th century and at a very slow rate (from 8.9% of total monetary stocks in 1847 to 12% in 1873 and 45% in 1914). F. Caron, *Histoire économique de la France, XIXe–XXe siècles* (Paris, 1981), 56.

[5] For Byzantine knowledge of monetary matters, see A. E. Laiou, "Economic and Noneconomic Exchange," *EHB* 693–96.

at the very least for those questions that can be treated in terms of statistical uniformity, even in the absence of numerical data.[6]

The Money Supply

Monetary Production and Its Administrative Organization

The production and output of coins were dictated by the needs of the public finances and were organized within the framework of the fiscal administration, as M. Hendy has demonstrated in several works, summarized in his *Studies in the Byzantine Monetary Economy* in 1985.[7] Tables 1–3 in the text sum up the different stages of this organization.

The main features of the administrative organization of monetary production were first established by Diocletian and Constantine and were still in existence at the beginning of the seventh century. Minting (Table 1 and Fig. 1) was one of the important functions of the *comes sacrarum largitionum,* and, until Justinian's reign, the procurators of the mints remained under his authority.[8] Gold and silver minting was restricted to the mint of the *comitatus,* in effect, the one in the capital, and was delegated to mints in the prefectures of Illyricum, Italy, and Africa. The *comitatus'* theoretical monopoly was noted on the inscription of the solidus and its fractions, which were invariably (apart from a few exceptions)[9] marked with the stamp CONOB (Con[stantinopoli] ob[ryziacus]: fine gold solidus of Constantinople). For a long time, this uniform mark impeded or delayed the identification of these provincial issues, for which purpose numismatists relied on stylistic analysis, notably the comparison with the bronze coinage bearing the mark of its provincial mint, in conjunction with the study of provenances. Our information in this field has advanced regularly since P. Grierson and J. Lafaurie began their pioneering studies in the 1960s, to the synthesis presented by W. Hahn in *Moneta Imperii Byzantini* (*MIB*) and the corpus on Thessalonike by M. Metcalf and on Carthage by C. Morrisson in *Studies in Early Byzantine Gold Coinage* (1988).[10] The Thessalonike mint production, which was continuous between the late fifth and early seventh centuries

[6] J. Hicks, *A Theory of Economic History* (Oxford, 1969), 2–5.

[7] M. F. Hendy, *The Economy, Fiscal Administration, and Coinage of Byzantium* (Northampton, 1989), arts. 4–8; idem, *Studies in the Byzantine Monetary Economy c. 300–1450* (Cambridge, 1985), 371–447.

[8] R. Delmaire, *Largesses sacrées et* res privata: *L'*aerarium *impérial et son administration du IVe au VIe siècle* (Rome, 1989).

[9] TESOB or THSOB disappeared from solidi of Thessalonike from Zeno's reign on. A unique solidus of Justinian in Carthage bears the mark ΛΦΡ[ικη]. Other coins of Justinian with the mark ROMOB are known, as is a rare solidus of Justin II with ΛΛZOB.

[10] The three volumes of W. Hahn, *Moneta Imperii Byzantini* (Vienna, 1973–81) (hereafter *MIB*), and idem, *Money of the Incipient Byzantine Empire (Anastasius–Justinian I)* (Vienna, 1999), constitute the best available discussion, although there is no agreement over some identifications (e.g., the attribution of solidi to Cyprus or Kherson). Cf. C. Morrisson, *RN,* 6th ser., 16 (1974): 185–90; 17 (1975): 196–99; 25 (1983): 217–25, or S. Bendall, *The Celator,* October 1989: IV, XXII–XXIII, with regard to ideas adopted by Hahn in his introduction to *Studies in Early Byzantine Gold,* ed. W. Hahn and W. E. Metcalf (New York, 1988).

Table 1
Monetary Production at the Beginning of the Seventh Century

Administrative Prefecture/Exarchate	District Diocese/Province	Mints (temporary mint)	Metals Minted
East	Thrace	—	
	Constantinople	Constantinople	AV, (AR), AE
	Pontos	Nikomedeia	AE (→ 629/30)
	Asia	Kyzikos	AE (→ 629–630)
	Orient	Antioch	AE (→ 610)
	(Isauria)	(Seleukia)	AE (→ 612–618)
	Egypt	Alexandria	AE (→ 646)
Illyricum	Dacia	—	
	Macedonia	Thessalonike	AV, AE (→ 629–630)
Africa	Africa	Carthage	AV, AR, AE (533–695)
		(transferred to Cagliari)	AV, AE (695–720)
		(Cartagena)	AV (ca. 550–ca. 625)
Italy	Italy	Ravenna	AV, AR, AE
	Rome	Rome	AV, AR, AE
(*Quaestor sacri palatii/ Comes sacri patrimonii*)	Sicily	Catania	AV, AE
(*Quaestura exercitus*)	(Cyprus)	(Constantia)	AE (626–629)
		Kherson	AE (→ 658/9)

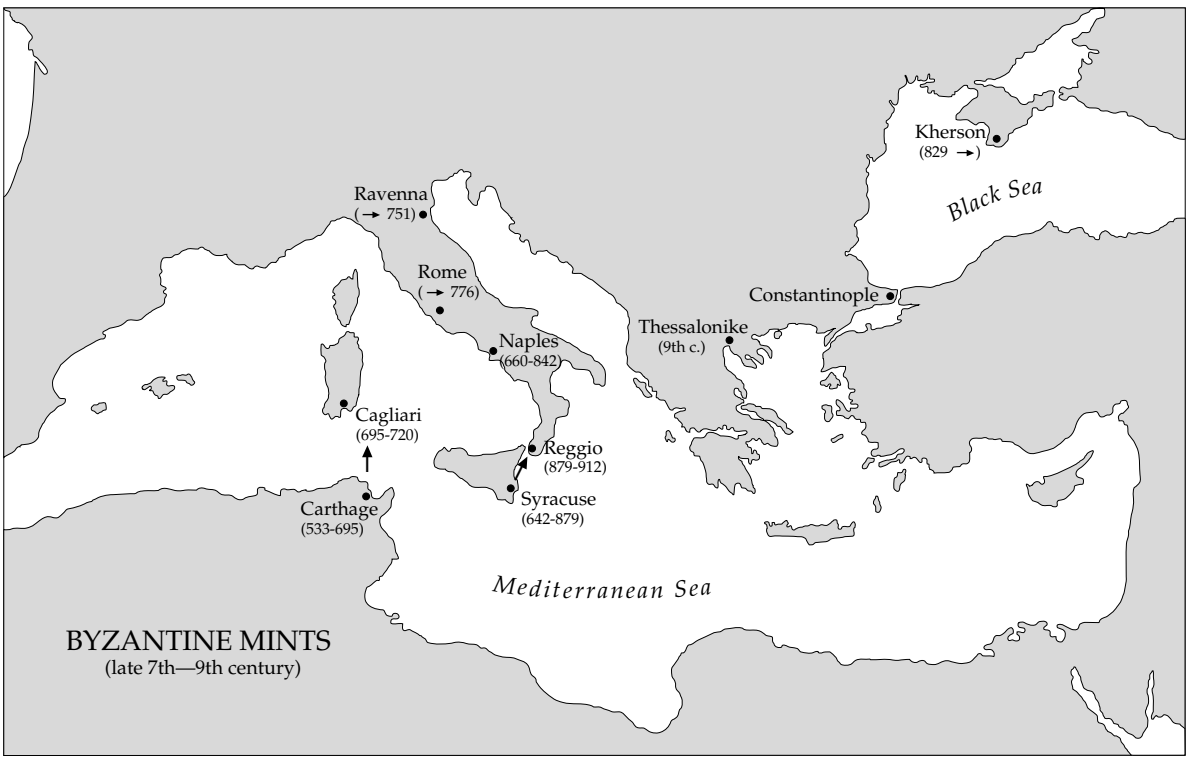
Note: AE = copper; AR = silver; AV = gold.

under Herakleios, has been partly individualized, thanks to a large find discovered at Thessalonike in 1948.[11] Carthage began to strike a gold coinage in 537/8, four years after the reconquest, as has been established by numerous local finds. It continued until the fall of the city in 695. Sicilian issues were outside the framework of the prefectures and subsequently of the exarchates. Though clearly individualized from the time of Constans II on, they were in fact earlier, as the Monte Judica hoard suggests, which allows us to push the date of the first minting of solidi to the reign of Justin II, at least.[12] In Spain, the minting of the rare debased tremisses, which is known for the

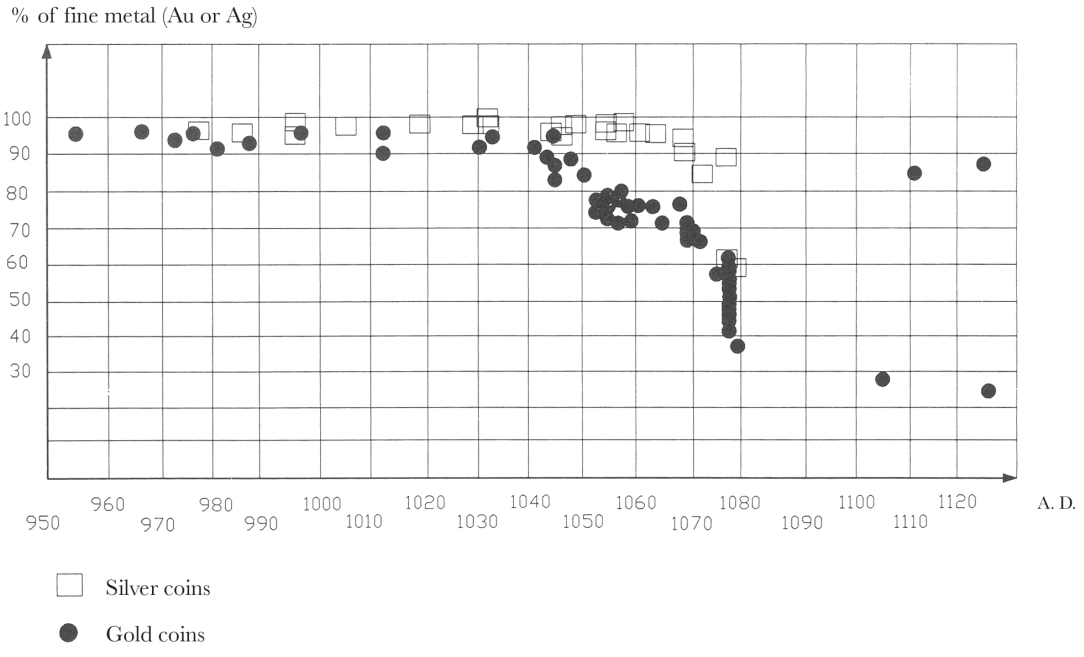
[11] M. Oeconomides and J. Touratsoglou, "The 1948 Thessaloniki Hoard of 6th-Century Byzantine Coins: A Contribution to the Study of the Mint of Thessaloniki," *Numismatica e Antichità Classiche. Quaderni Ticinesi* 8 (1979): 289–312.

[12] W. Hahn and N. Fairhead, "The Monte Judica Hoard and the Sicilian *Moneta Auri* under Justinian I and Justin II," in *Early Byzantine Gold* (as above, note 10), 29–38.

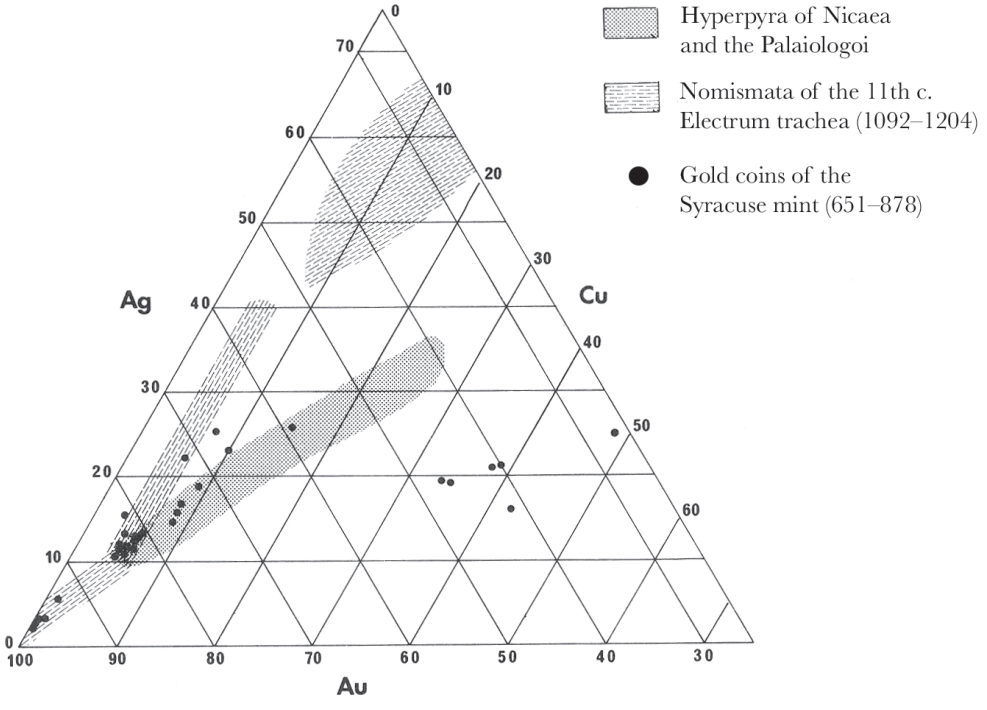
1a. Byzantine mints, 6th and early 7th centuries



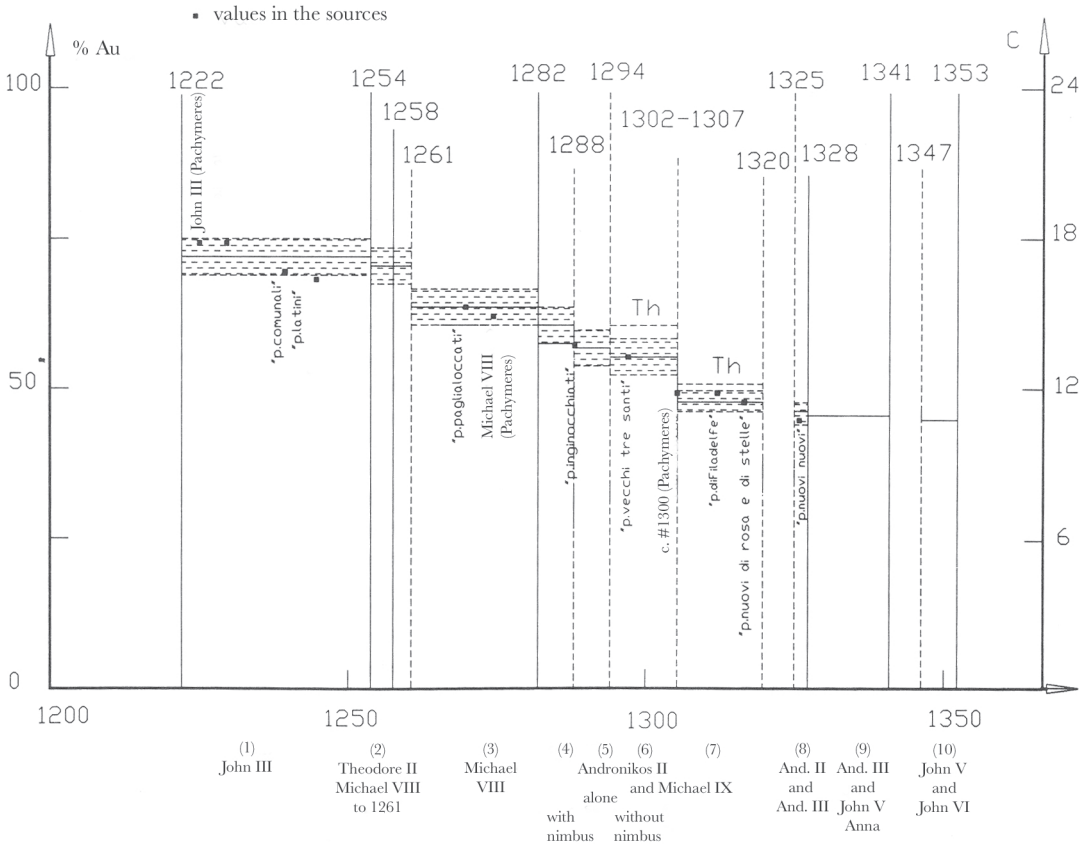
1b. Byzantine mints, late 7th–9th century



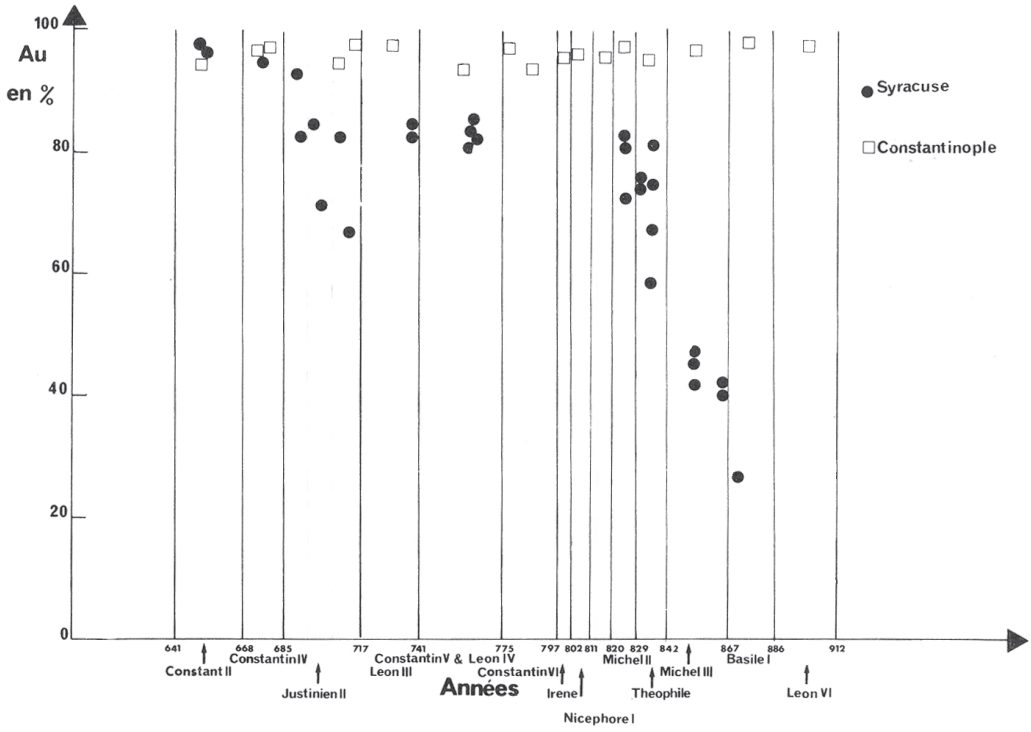
2. The debasement of the Byzantine gold and silver coinages (after C. Morrisson, *Monnaie et finances à Byzance: Analyses, techniques* [Aldershot, 1994], art. IV, p. 300)



3. The different processes of debasement of gold coinage at Byzantium (after Morrisson, *Monnaie*, art. X, p. 280, fig. 3)

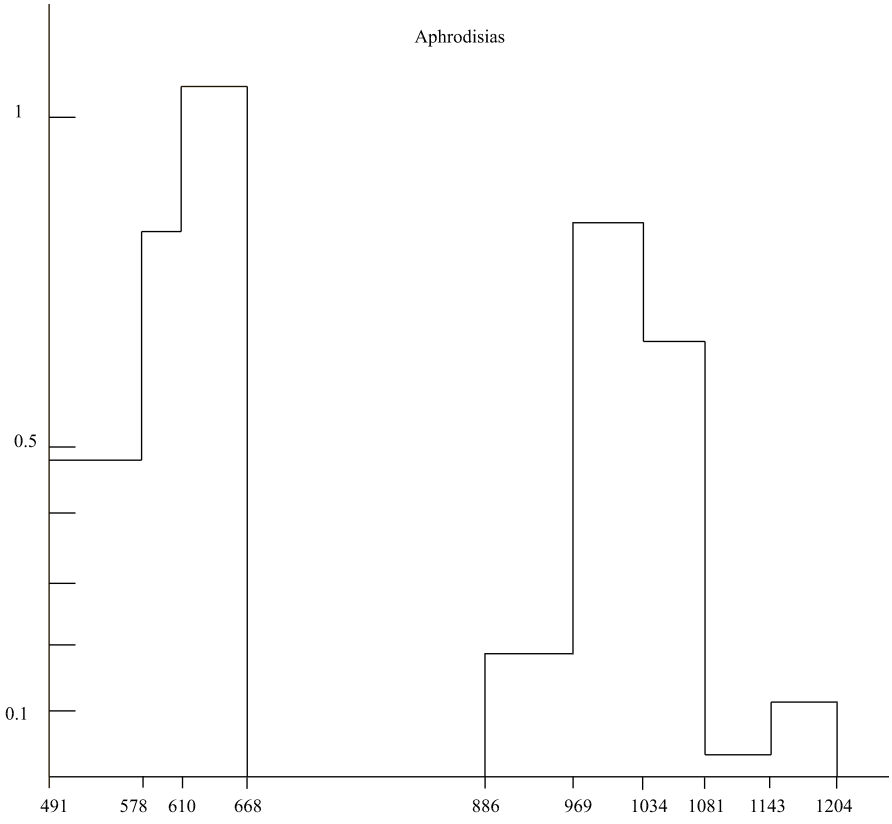


4. The last debasement of the hyperpyron (1222–1354) (after Morrisson, *Monnaie*, art. IV, p. 310) Dots indicate the values (in carats) given by Pachymeres and Pegolotti (the coin names given by the latter are shown vertically). Shaded areas show the range of values from analyses. "Th" and the dotted lines below it are the slightly higher values measured on hyperpyra attributed to Thessalonike.

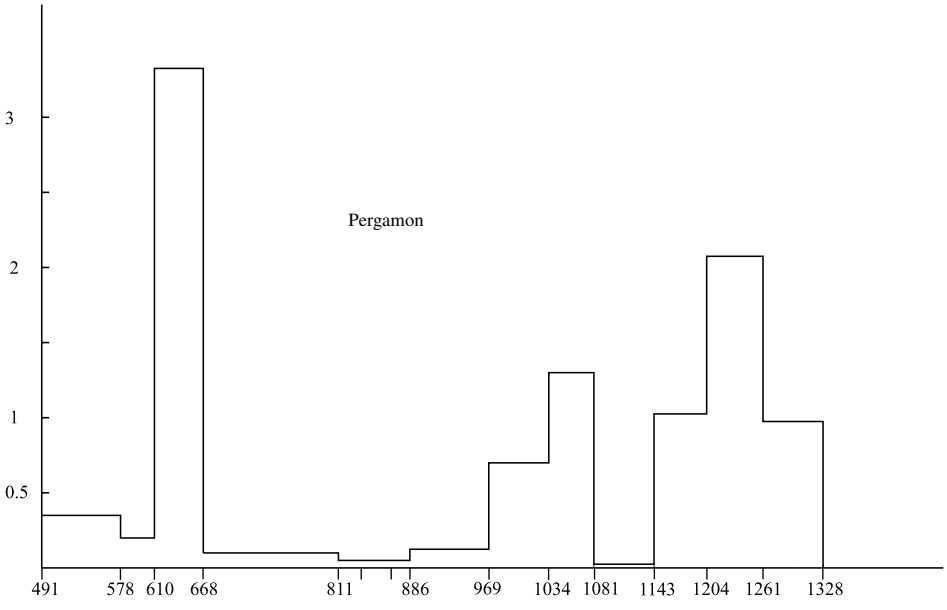


5. The fineness of the gold coinage at Syracuse (642–879) (after Morrisson, *Monnaie*, art. X, p. 280, fig. 2)

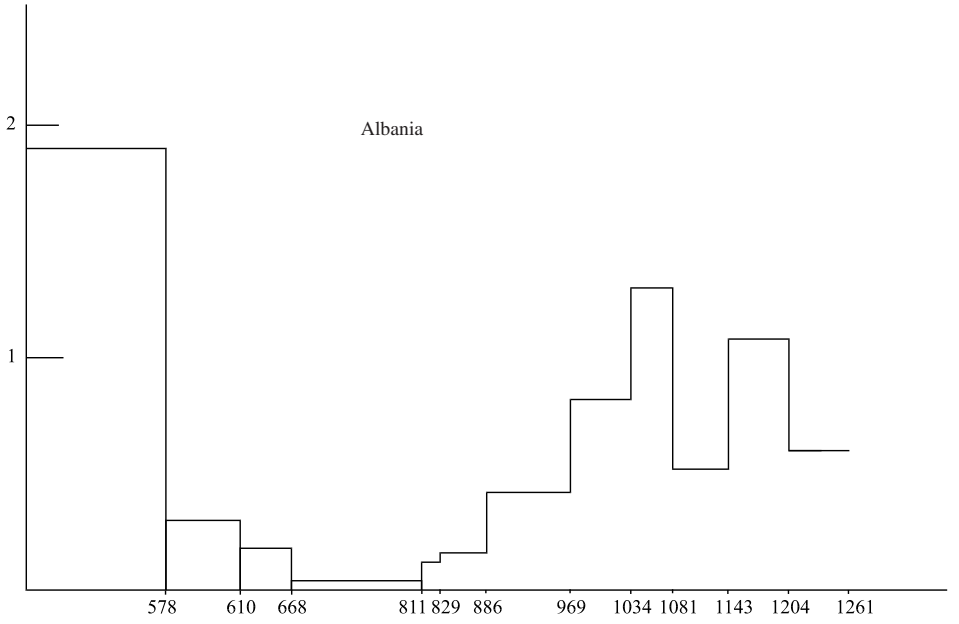
6. Index (or frequency index) of monetary finds on various sites. On these and the following graphs, (Figs. 6.1–6.15) the figures on the vertical axis indicate the annual rate of loss (number of coins found during each period). *Source*: C. Morrisson in *Hommes et richesses dans l'Empire byzantin*, 2 vols. (Paris, 1989–91), 2: 302–3, or original graphs by the author and D. Giovagnoli.



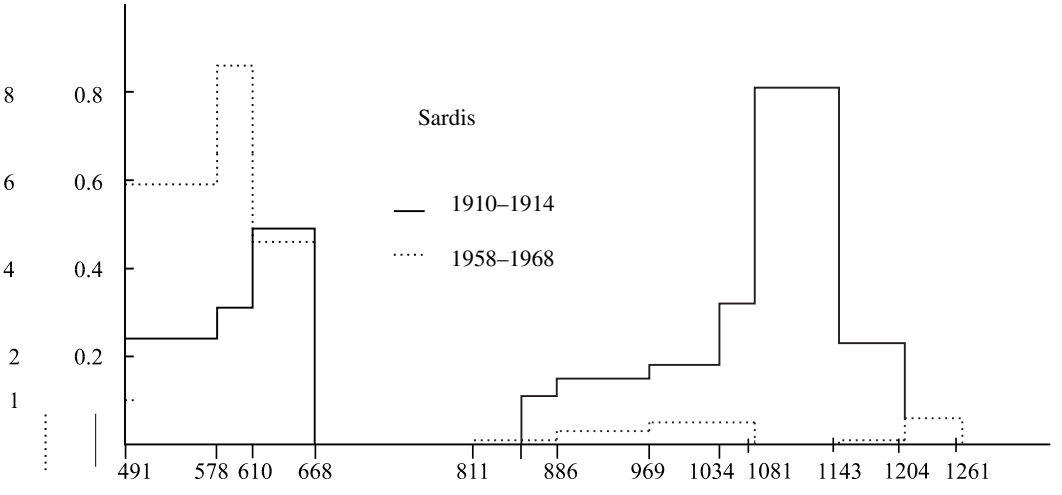
6.1. Monetary finds from Aphrodisias



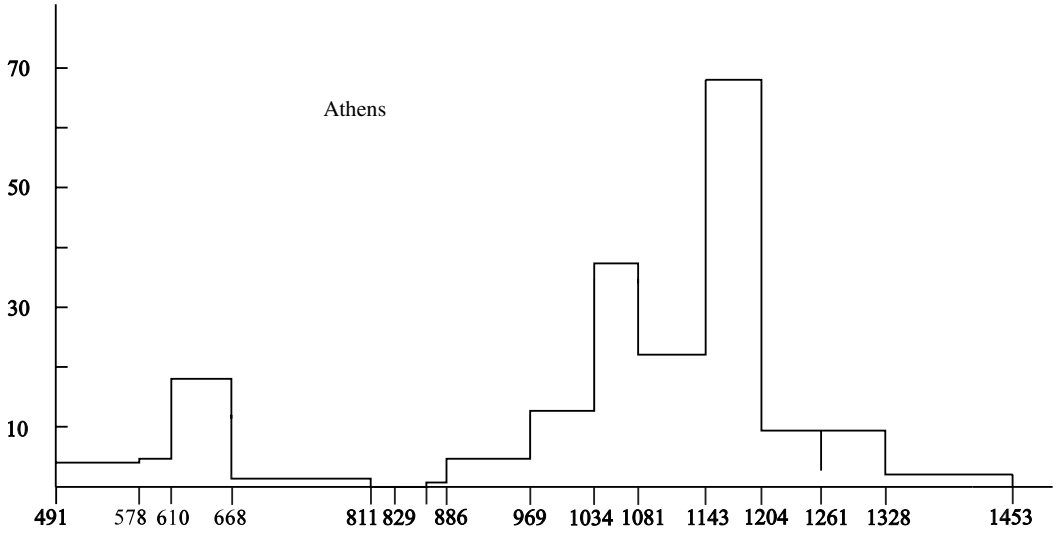
6.2. Monetary finds from Pergamon



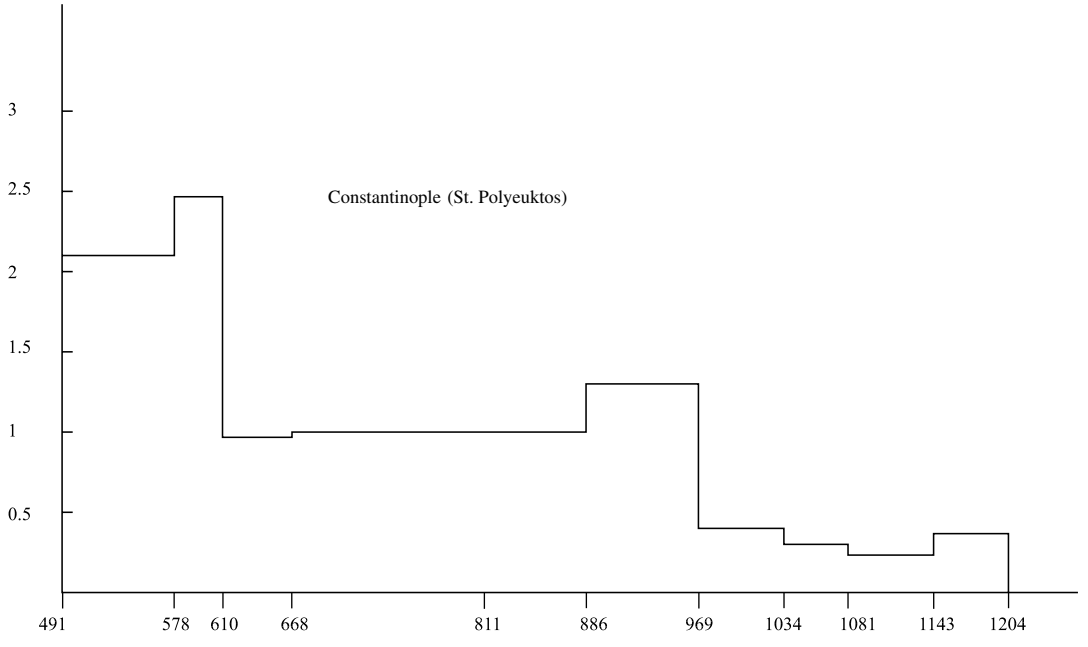
6.3. Monetary finds from Albania (based on data from H. Spahiu, "Monedha bizantine të shkekujve V–XIII, të zbulurara në territorin e Shqïpërisë," *Iliria* 9/10 [1979–80]: 353–421)



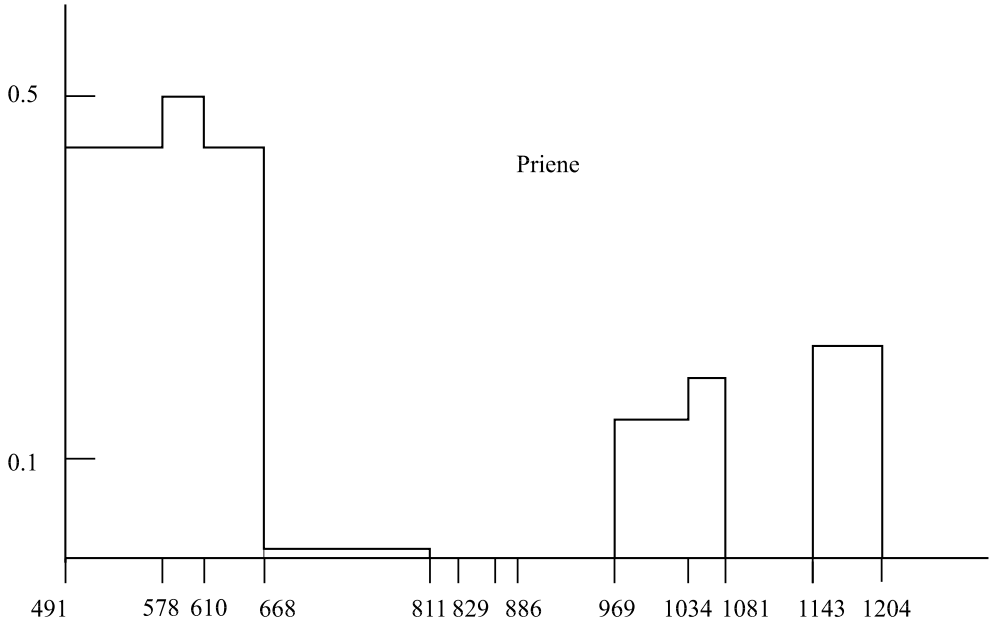
6.4. Monetary finds from Sardis



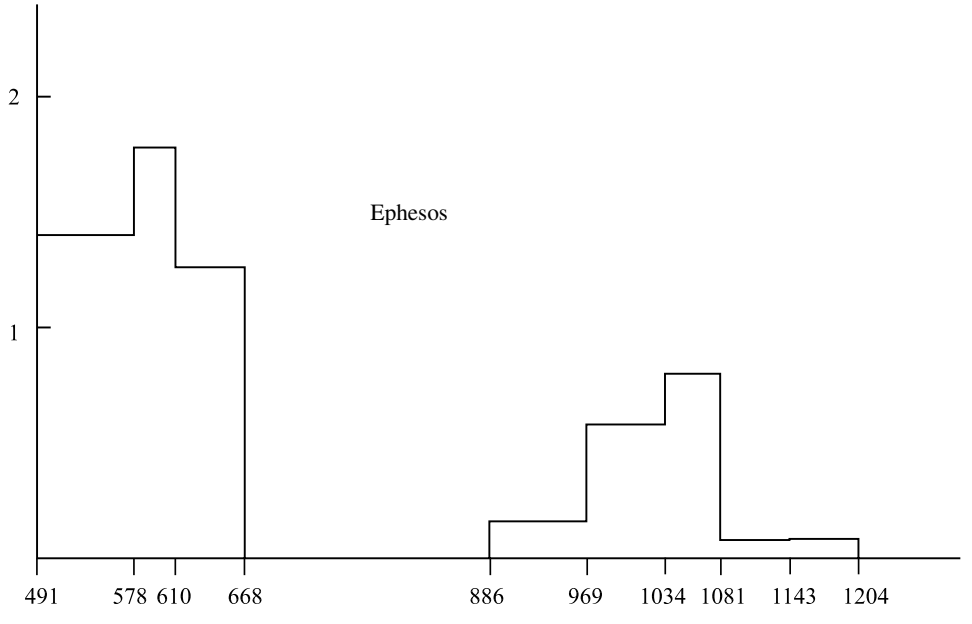
6.5. Monetary finds from Athens



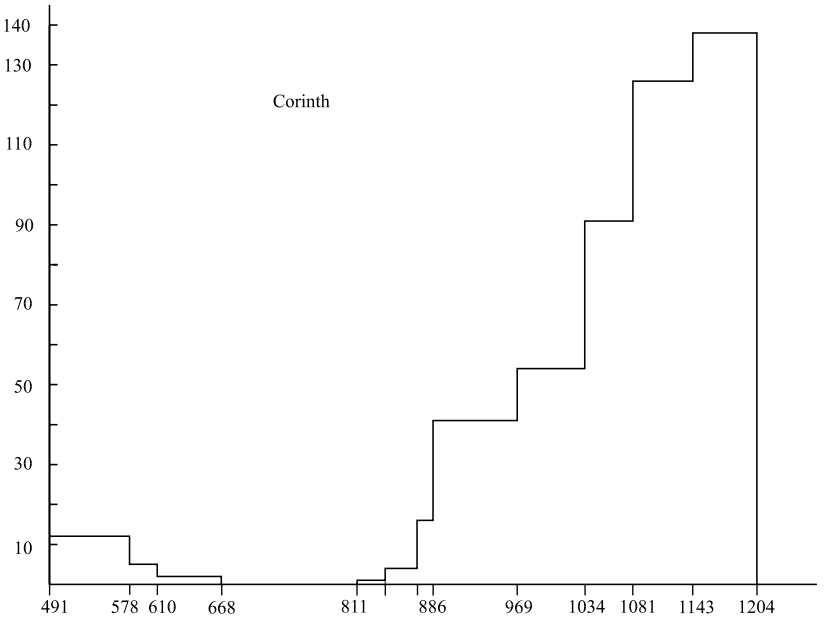
6.6. Monetary finds from Constantinople (St. Polyeuktos)



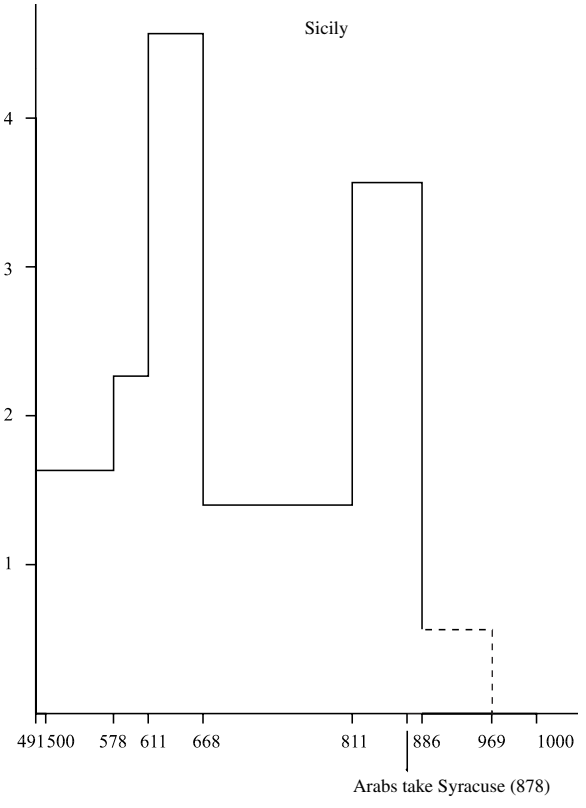
6.7. Monetary finds from Priene



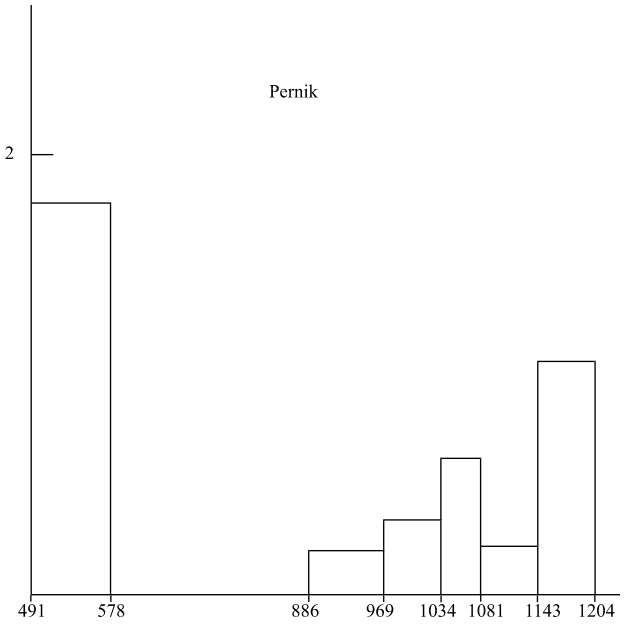
6.8. Monetary finds from Ephesos



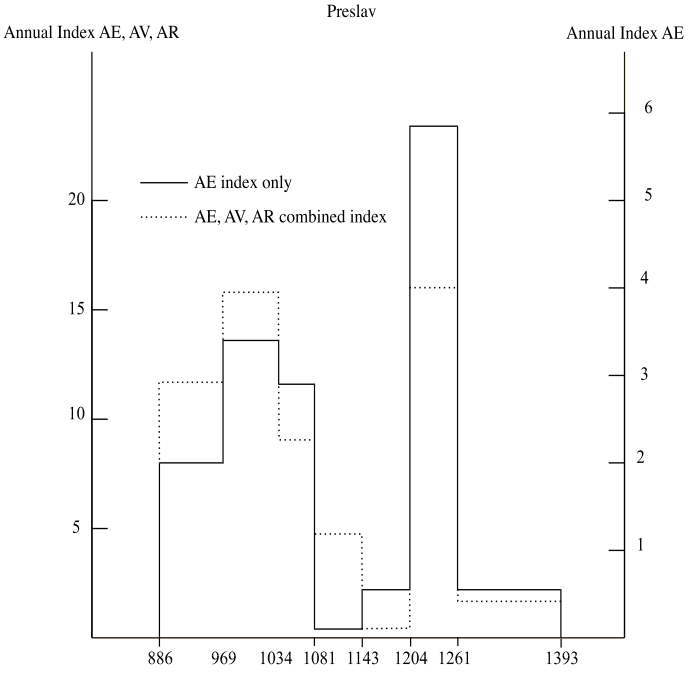
6.9. Monetary finds from Corinth



6.10. Monetary finds from Sicily (*Source:* see n. 140, pp. 957–58)

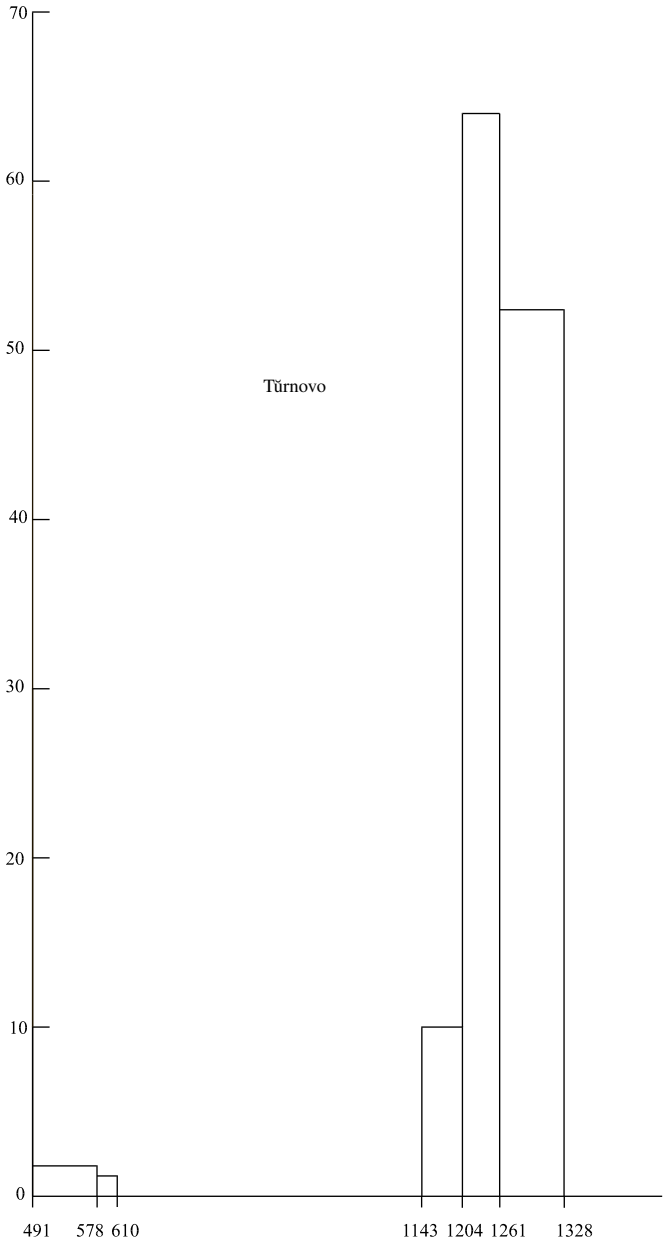


6.11. Monetary finds from Pernik (based on data from I. Iurukova in I. Changova et al., *Pernik*, 2 vols. [Sofia, 1981–83], 1: 218–61; 2: 102–76)

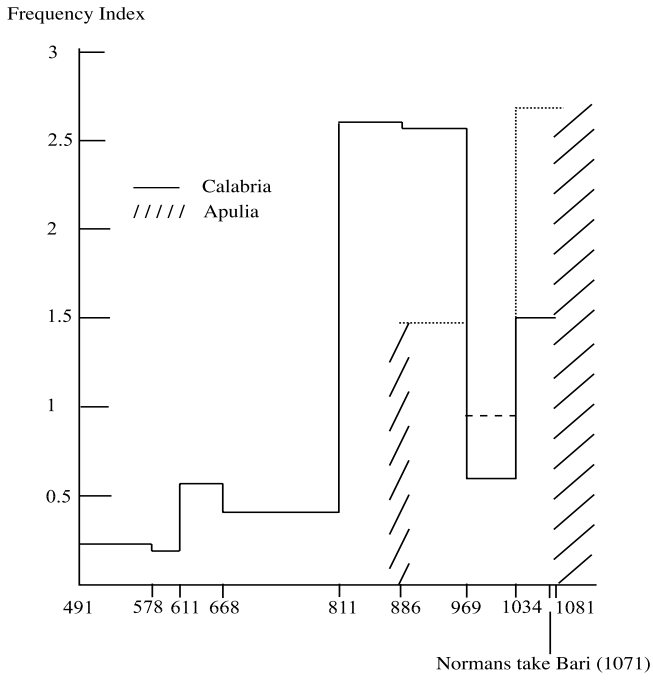


Note: AE = copper; AR = silver; AV = gold.

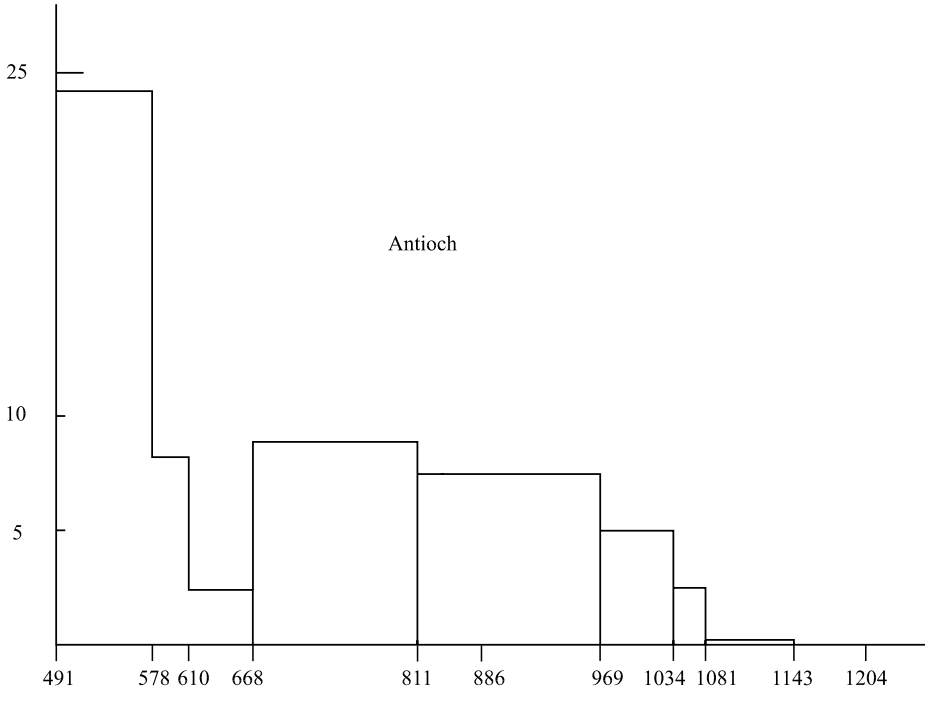
6.12. Monetary finds from Preslav (based on data from I. Jordanov in D. Angelov et al., *Pliska Preslav*, 5 vols. [Sofia 1979–87], 4: 207–14)



6.13. Monetary finds from Turnovo (based on data from K. Dochev, *Moneti i parichno obreschenie v Trnovo XII–XIV* [Veliko Turnovo, 1992]



6.14. Monetary finds from Calabria and Apulia (based on data from G. Guzzetta, "Per la Calabria bizantina: Primo censimento dei dati numismatici," in *Calabria bizantina: Istituzioni civile e topografia storica* [Reggio, Calabria, 1986], 251–80)



6.15. Monetary finds from Antioch

reigns of Justinian, Maurice, Phokas, and Herakleios, probably ceased when Cartagena fell to the Visigoths in 615.

The age of Herakleios was very troubled, resulting in new temporary military mints that struck a bronze coinage to meet the needs of the troops, in 609–610 at Cyprus and Alexandretta (Alexandria ad Issum),[13] in 613–14 in Jerusalem, in 615–619 in Isauria, and again in Cyprus in 629. The folles series with immobilized or blundered mintmarks has been convincingly shown to be die-linked to organized issues from 610 to 630 under Persian rule.[14] Whatever the nature of the mint authority, the existence of these more or less regular folles, and of numerous imitations, of the Herakleios type, then of that of Constans II, as well as countermarks with Herakleios' monogram applied in Syria-Palestine during the years around 626–662, all witness to the vitality of money circulation and demand in the region. It is not impossible that these requirements were met, successively or alternatively, first by the Byzantine authorities and then, after the Arab conquest, by the cities or other administrative bodies, which continued to do so until the onset of a bilingual Arab-Byzantine coinage ca. 680 or later, followed by ʿAbd al-Malik's reformed coinage in 697.[15]

The disappearance of the sacred largesses can be dated to 610; this, together with the devolution of its previous prerogatives to the *sekreta* of different logothetes, brought the production of money under the authority of the *vestiarion*. The reference, in 899, to an ἄρχων τῆς χαραγῆς (master of the mint) found in the *kletorologion* of Philotheos places him among this *offikion*'s staff. The precious metal was probably smelted in the χρυσοχεῖον mint, whose *archon* was dependent on the *sekreton* of the *eidikon*. This official can be identified with certainty with the χρυσοεψητής attested to by Philotheos and earlier, in 842–843, by the Uspenskii *taktikon*. Finally, the *zygostates,* the controller of the weight and quality of the imperial coinage, was dependent on the office of the *sakellion*.[16]

These few data apply to the capital, whose production was intended to supply the eastern themes (Asia Minor and the Balkans), which constituted the empire's heart and principal support. Thus Constantinople alone supplied a large area with both bronze and precious metals (see Fig. 1b). This centralization was broken only very partially

[13] Hahn (*MIB* 2:86–87) rejects the attribution proposed by Philip Grierson and assigns this issue to Alexandria. In the absence of known provenances, it is impossible to decide the matter.

[14] H. Pottier, *Le monnayage en Syrie sous l'occupation perse/Coinage in Persian Syria (610–630),* with a historical introduction by C. Foss, Cahiers Ernest-Babelon 8 (Paris, forthcoming).

[15] C. Morrisson, "La monnaie en Syrie byzantine," in *Archéologie et histoire de la Syrie,* vol. 2, *De la période perse à la période byzantine,* ed. J.-M. Dentzer and W. Orthmann (Saarbruck, 1989), 191–204; eadem, "Le monnayage omeyyade et l'histoire administrative et économique de la Syrie," in *La Syrie de Byzance à l'Islam, VIIe–VIIIe siècles,* ed. P. Canivet and J.-P. Rey-Coquais (Damascus, 1992), 309–18 (commentary by M. Bates, 319–21). This has recently attracted growing interest, and many articles have appeared. For an updated survey, see C. Foss, *Introduction to Coinage in the Near East in the Seventh Century* (Washington, D.C., forthcoming).

[16] N. Oikonomides, *Les listes de préséance byzantines des IXe et Xe siècles* (Paris, 1972), 315–17. In the 12th century the smelting workshop was also the place where coins were struck. Does the following definition in the *Souda* (ed. A. Adler [Leipzig, 1935]), 4:833) refer to these dual functions? Χρυσοεψητεῖον: ἔνθα χωνεύουσι καὶ ἕψουσι τὸν χρυσόν.

Table 2
Centralization and Fragmentation of Monetary Production
(Mid-7th–11th Centuries)

Administrative District	Theme	Mints (temporary mint)	Metals Minted
East	Thrace	Constantinople	AV, AR, AE
	Macedonia (est. 824)	(Thessalonike?)	AE (9th, 11th centuries)
	Kherson (est. ca. 832)	Kherson	AE (842–989?)
West		Rome	AV, AR, AE
		Ravenna	AV, AR, AE
		Naples	AV (ca. 660–842)
		Syracuse	AV, AE (642–879)
		(transferred to Reggio)	AV, AE (879–912)

Note: AE = copper; AR = silver; AV = gold.

when the two provincial mints at Kherson and Thessalonike resumed activity with the creation of new themes and the reorganization of former districts under Emperor Theophilos. Kherson began issuing cast bronze coins with the imperial monogram at the end of the reign of Michael III. This series with its particularly easily recognized fabric continued until Basil II.[17] Other bronzes of Michael II and Theophilos, in a fairly easily recognizable style, can very probably be attributed to Thessalonike. Other folles of Basil I and Leo VI, sharing some traits with Sicilian issues, have been convincingly attributed, on the basis of local provenances, to Reggio where the mint of Syracuse was likely transferred after 879.[18] Hendy has suggested also attributing to Thessalonike the folles that bear the name of Constantine X and his successors until 1092, which would have been struck by the provincial mint while Constantinople was striking anonymous folles. However, this thesis has yet to be confirmed by research into the provenances.[19]

In the empire's last western possessions, the situation contrasted diametrically with

[17] A. Anokhin, *Monetnoe delo Khersonesa (IV v. do n.e.–XII v. n.e.)* (Kiev, 1977) (The coinage of Khersonesus: 4th Century B.C.–12th Century A.D.) BAR International Series 69 (Oxford, 1980). The chronology by I. V. Sokolova, *Monety i pechati vizantiiskogo Khersonesa* (Leningrad, 1983), is preferable.

[18] Thessalonica mint, see D. M. Metcalf, "The Folles of Michael II and Theophilus before his Reform," *HBN* 21 (1967): 28–29 (nos. 30–36); idem, "The Reformed Folles of Theophilus: Their Styles and Localisation," *ANSMN* 14 (1968): 132 (groups S and Z). Cf. Hendy, *Studies,* 423–25, with the earlier bibliography. See V. Penna, "Numismatic Circulation in Corinth from 976 to 1204," *EHB* 655–58. Reggio mint, see D. Castrizio, "La zecca bizantina di Reggio dopo la conquista araba di Siracusa," *Akten des XII. Internationaler Numismatischer Kongreß* (Berlin, 2000).

[19] Hendy, *Studies,* 428. He now attributes these folles to the *moneta publica* in Constantinople (*DOC* 4.1: 22–28).

Table 3
Monetary Production from 1081 to 1204

Administrative District	Mint (temporary mint)	Metals Minted
Thessalonike-Strymon-Boleron	Thessalonike	AV, El, B, AE (ca. 1092?–ca. 1190?)
Hellas-Peloponnesos	Thebes?	AE (ca. 1092?–ca. 1190?)
Macedonia-Thrace	(Philippopolis?)	AV, B (ca. 1092?)

Note: AE = copper; AV = gold; B = billon; El = electrum.

this relative centralization; indeed, the fragmentation in Italy is explained by the isolation of the various regions following the Lombard conquest. Stylistic analysis shows that several groups of gold coinages existed; attribution is not always easy given the absence of a sufficient number of secure provenances. However, by comparing these gold pieces with bronze coins bearing mint marks and the evidence provided by some hoards, one has been able to identify with increasing confidence the mintings of the main mints, Ravenna and Syracuse, as well as those of Rome and Naples. Their particular metrology, notably the reduction in fineness, and consequently in weight, which affected them from the seventh century on—coinciding, in Sicily, for instance, with the creation of the theme ca. 692–695—could point to the growing regionalization and autonomy of local finances, left to their own resources. In Rome, too, the substitution of the emperor's or the mint's monogram by the papal monogram on the reverse of the silver coinage at the end of the seventh century shows how the pope's control over the operation and financing of the local coinage was growing.[20]

Very little is known about the way money minting was organized during the age of the Komnenoi, and the outline above is only a hypothesis—albeit a plausible one—constructed by Hendy while comparing numismatic classification with the known administrative structures. It is noteworthy that the imperial mint and χρυσοπλύσια situated in the Great Palace, remained in operation during this period, as the place where precious metals were smelted and purified, and where they were kept, not only in coin form. According to evidence provided by Niketas Choniates, the crowd of rioters who sacked the palace when Andronikos I was deposed in 1185 found wealth amounting to "12 kentenaria of gold, 30 kentenaria of silver, and 200 kentenaria of bronze pieces,"

[20] C. Morrisson, "Nouvelles recherches sur l'histoire monétaire byzantine: Evolution comparée de la monnaie d'or à Constantinople et dans les provinces d'Afrique et de Sicile," in *Monnaie et finances à Byzance: Analyses, techniques* (Aldershot, 1994), art. 10, pp. 274–79 (Sicily), and eadem, "La trouvaille de monnaies d'argent byzantines de Rome (VIIe–VIIIe siècles): Analyses et chronologie," ibid., art. 12 (Rome).

not including unminted metal.[21] These were the very workshops in the Great Palace that always attracted "cupidity on account of the gold piled up there" (διὰ τὸν ἐπισεσωρευμένον ἐκεῖθι χρυσόν), and that Nicholas Mesarites describes in rhetorical terms in his account of John Komnenos' attempted usurpation in 1201. His text does provide some description of the semi-industrial nature of a mass-production process that was effected by "men in blackened clothes, with dusty feet and faces covered in sweat," who worked "for whole months, even years, night and day to watch over and control the flux and reflux of the gold," or who, "hidden in their dwellings, deprived of the sun, work unceasingly with hammer and anvil."[22]

The increase in particularism and provincial disputes during the twelfth century gave rise to issues of coins by mints of a more or less ephemeral nature, created *ex nihilo*. During the age of Alexios I, the Gabras family struck folles at Trebizond, some bearing the emperor's effigy, but most of them anonymous. Niketas Choniates tells us that Theodore Mankaphas "struck a silver nomisma and had his name engraved on it." Roughly produced trachea bearing the effigy of Theodore, which can be attributed to Philadelphia in the years 1188–90, have been found in Asia Minor, Bulgaria, and northern Greece. The most important issues of coins were those of Cyprus by Isaac Komnenos (1184–91). The wealth of the island, together with the length of the usurpation, explains why these are so varied and abundant; all the denominations are represented, with the exception of the hyperpyron, which may have been excluded on account of some residual respect for the capital's preeminence.[23]

The Latin Empire very probably retained the Great Palace mint, given that, when the Latin embassy came to negotiate a peace settlement, Michael VIII stipulated that the revenues from the *kommerkion* and the mint be divided in half.[24] Under the Palaiologoi, minting presumably remained within the domain of the *vestiarion* and its προκαθήμενος.[25] It was divided between the two mints, that of Thessalonike and that of the capital, which functioned until 1453, as proven by documents that mention the issues of Constantine XI, which were intended to pay the town's defenders, and by the presence of these silver coins in a recently discovered hoard.[26] The production of bronze coins in Thessalonike was first identified by T. Bertelè in *L'imperatore alato* in 1951, and

[21] *Nicetae Choniatae Historia,* ed. J. L. van Dieten (Berlin–New York, 1975), 347 (hereafter Choniates): διαρπάζουσιν . . . ὁπόσα χρήματα εὕραντο παρὰ τοῖς Χρυσιοπλυσίοις ἔτι ταμιευόμενα (ἦσαν δὲ ἄνευ τῶν μὴ κεκομμένων εἰς νόμισμα ὑλῶν χρυσίου κεντηνάρια δώδεκα, ἀργυρίου τριάκοντα καὶ τοῦ ἐκ χαλκοῦ κόμματος διακόσια).

[22] Nicholas Mesarites, *Die Palastrevolution des Johannes Komnenos,* ed. A. Heisenberg (Würzburg, 1907), 25–26. C. Morrisson, "Moneta, χαραγή, zecca: Les ateliers byzantins et le palais impérial," in *I luoghi della moneta: Le sede delle zecche dall'antichità all'età moderna,* ed. L. Travaini (Milan, 2001).

[23] Hendy, *Studies,* 438–39; S. Bendall and C. Morrisson, "Théodore Pierre, Théodore Branas ou Théodore Mankaphas?" *RN,* 6th ser., 36 (1994): 170–81.

[24] *Georgii Acropolitae Opera,* ed. A. Heisenberg, 2 vols. (Leipzig, 1903), 1:163: ἐθέλω τοὺς ἐν τῇ Κωνσταντινουπόλει Λατίνους πρὸς τὴν τῶν Ῥωμαίων τελεῖν ἀρχὴν μερίδα μὲν τὴν ἐκ τοῦ κομμερκίου αὐτῶν τὴν ἡμίσειαν κἀκ τοῦ χρυσεψητείου αὐτῶν τὴν ἀνάλογον ὡσαύτως εἴσοδον.

[25] Hendy, *Studies,* 440–47.

[26] S. Bendall, "Un trésor de monnaies de Constantin XI," *RN,* 6th ser., 33 (1991): 134–42.

S. Bendall has attributed a series of relatively rare hyperpyra and basilika, bearing the names of Michael VIII or Andronikos II, to this mint.[27] In Constantinople, production may have been split between two mints: the imperial mint in the Great Palace linked, as under the Komnenoi, with the imperial treasury and the *vestiarion,* striking mainly gold and silver that had been received as taxes; and a mint that struck low-value coins or, possibly, silver brought by the public.[28] In the *Libro dei conti* of Badoer, a reference to the Greek banker Constantine Kritoboulos describes him as *dal bancho* or *da la zecha,* and business deals concluded with him often involved silver, whether minted or not, rather suggesting that the banker was connected specifically with this "public" workshop, the last avatar of the early Byzantine *moneta publica.*[29]

The administrative organization of Byzantine mints presents specific features that remained constant during its whole history, and which it is important to stress. Unlike in the West, there were in Byzantium no concessions of minting rights to local authorities (counts, bishops, religious establishments). Supervision of the mint and its possible profits always belonged to the emperor, though he had probably farmed out the mint or part of it by the fourteenth century. Thus the government was certainly capable of controlling, if not the total money supply, at least the output of new types, which made up a vital part of it. However, this did not imply that the emperor or his advisers were capable of conducting a monetary policy in the modern meaning of the term; he was probably content with adapting the quantities struck, their metal content and nominal value, to both his resources in *matières*—as French authors in the eighteenth century designated bullion—and his financial needs. The frequently quoted passage in Psellos' *Chronographia* is perfectly explicit in this respect, referring to Michael VII's accomplished wisdom and experience of business, with his "thorough grasp of the whole system of taxation, of revenues and public expenditure, of the incomes paid from the exchequer and the percentage of income paid back to the treasury in the form of taxes. He knew all about the mint, the exact weight of a *stater* [i.e., a nomisma], how a touchstone functioned, what proportion of precious metal was included in every gold coin."[30]

[27] S. Bendall, "Palaeologan Gold Coins from the Mint of Thessalonika," *Gazette numismatique suisse* 32 (1982): 15–21; idem, "Thessalonican Hyperpyra of Michael VIII?" ibid., 40–41; idem, "A Thessalonican Hyperpyron of Andronicus II and Michael IX?" *NCirc* 89 (1981): 158; idem, "A Palaeologan Silver Coinage for Thessalonica," *NCirc* 103 (1995): 139. Cf. S. Bendall, *A Private Collection of Palaeologan Coins* (Wolverhampton, 1988), nos. 61, 206–9 (hereafter *PCPC*).

[28] Bendall, *PCPC,* 62, links the existence of two very different groups of Manuel II stavrata to the two-mints hypothesis put forward by Hendy (*Studies,* 260 n. 15).

[29] *Il libro dei conti di Giacomo Badoer,* ed. U. Dorini and T. Bertelè (Rome, 1956), 152, line 14, *per resto d'arzento;* 179, line 2, *616 perperi grievi;* 179, line 37, and 204, line 25, *livre 10 de stavrati grievi,* etc.; Hendy, "Aspects of Coin Production and Fiscal Administration in the Late Roman and Early Byzantine Period," in *Economy* (as above, note 7), art. 5, pp. 131–34, and "The Administration of Mints and Treasuries, 4th to 7th Centuries, with an Appendix on the Production of Silver Plate," art. 6, p. 6.

[30] *Michael Psellos, Chronographie,* ed. E. Renauld, 2 vols. (Paris, 1926), 2:173: τήν τε τῶν στατήρων ἐξεργασίαν καὶ τὴν τῆς στάθμης ἰσορροπίαν καὶ τὰς ῥοπὰς καὶ τὰ λείμματα. τήν τε χρυσῖτιν ὅπως ἐργάζοιτο καὶ τῶν χρυσῶν χαρακτήρων ὁπόσα ἕκαστος μέτρα τῆς καθαρᾶς ὕλης ἔχοι. The translation is by E. R. A. Sewter, *Fourteen Byzantine Rulers* (Baltimore, Md., 1979), 368.

The Evolution of the Monetary System

General Features Ever since the creation of the Byzantine monetary system by Constantine in 312, its pivot had been the solidus-nomisma, a real coinage whose nominal value was equal to its intrinsic value, as is proven by the Theodosian Code,[31] promulgated in 325, which prescribed, respecting the payment of taxes:

> If anyone wants to pay in solidi, let him pay for one ounce, seven (6) solidi of fine gold (*auri cocti*), each of five scruples (*scripula*), printed with our effigies, and naturally fourteen (12) for two ounces, thus bringing the entire sum due. The same method (*eadem ratione,* meaning 1 solidus = 4 scruples) must be observed if anyone brings some matter (metal), so that he may seem to have given solidi. Let the gold that is brought be received on scales balanced (*aequa lance*) by equal weights (*libramentis paribus*).[32]

The Justinianic Code reiterates these instructions, while abolishing the technical instructions about the weight and the honest way of holding the scales: "That the gold, brought by taxpayers, if anyone wants to pay it in solidi or in matter, be received on correct scales (*aequa lance*) and with equal weights (*libramentis paribus*)."[33] The practice of weighing gold money persisted throughout the period and is still attested by Psellos in his *Synopsis ton nomon,* in which he distinguishes between the different modes of exchange: "by weight, things like gold, silver, copper; by number, small change (*noummoi leptoi*); and by measure, wine."[34] Indeed, it is only in this context that the crisis provoked by the introduction of a light nomisma, the tetarteron, can be understood.

The just weight was, in fact, one of the conditions for the coinage's function as legal tender. The inscription on the *exagion* in the Cabinet des Médailles, ΔΙΚΑΙΟC CTAΘMOC TȣTPAXEOC VΠEPΠVPOV (11th–12th centuries),[35] echoes, if echo were needed, a long juridical tradition. In 367 it was made obligatory for sellers and buyers of solidi to accept these coins "modo ut debiti ponderis sint et speciei probae;" in 379 a reminder went out about "the uniform price of all the pure gold solidi" ("obryziacorum omnium solidorum uniforme pretium"), obligations that were reiterated by the Justinianic Code,[36] whereas in 445, Novel 16 of Valentinian III also punished with death

[31] Hendy, *Studies,* 329–30; J.-P. Callu, "Dénombrement et pesée: Le sou théodosien," *Bulletin de la Société française de numismatique* 34 (1979): 611–12, distinguishes the counted and weighed solidi from the end of the 4th century from the Constantinian solidi, which were simply counted.

[32] *CTh* 12.7.1. This text presents many difficulties and has given rise to an abundant literature. On weights and balances, see C. Entwistle, "Byzantine Weights," *EHB* 611–14.

[33] CIC, *CI* 10.73.1.

[34] Psellos, *Synopsis tōn nomōn,* PG 122:956.

[35] V. Laurent, "Le 'juste poids' de l'hyperpyron trachy," *Congrès international de numismatique, Paris, 1953, Actes* (Paris, 1957), 299–307.

[36] CIC, *CI* 11.11.1 and 3. Hendy, *Studies,* 365, translates "required weight and honest material." I think that "*species*" refers to the appearance of the piece and, basically, to its type. It was through visual examination of the piece that the money changer had to discern whether the type was falsified, and thus whether the coin was of poor alloy. Cf. J. Andreau, *La vie financière dans le monde romain: Les métiers de manieurs d'argent (IVe siècle av. J.-C.–IIIe siècle ap. J.-C.)* (Rome, 1987), 524.

anyone who dared "refuse or reduce a gold solidus of good weight." The *Basilics* renewed in their turn the dispositions of CI 11.11.1 and 3, and Novel 52 of Leo VI stated yet again that "every type of coin will conserve both its value and currency, so long as it comes from an authenticated mint, with an unadulterated fineness and an exact weight" (ἀπαραποίητον τὴν μορφὴν ἔχον καὶ τὴν ὕλην ἀκίβδηλον καὶ τὴν ὁλκὴν τέλειον).[37]

Though weight was an indispensable element, it was not the only one, being obviously indissolubly linked to fineness (the precious metal content). Conveniently enough, this is the meaning of the mark OB which features on Byzantine gold coins between 363 and 720 in Constantinople (and until the mid-8th century in Italy), since it recalls both weight (OB = 72, that is, the number of solidi struck to a pound, and fineness (OB = *obryzum,* or refined gold). The purity, restored by the reforms of Valentinian (367/8) to a level higher than 99%, the maximum that could be achieved by the procedures of the age, retained this extremely high level until the beginning of the reign of Anastasios, after which it fluctuated only slightly. At the turn of the sixth century, gold money had an average fineness of 98% and thus perfectly deserved its qualification as *holokottinos* (ὁλοκόττινος).[38] This hybrid term was developed from the expression *aurum coctum* and occurs very frequently in early Byzantine documents, as well as subsisting in current speech until the eleventh century, at which date it began to be replaced by the term *hyperpyron* (ὑπέρπυρον, "cooked, refined by fire").

Weight and fineness were joined by another element, the authenticity of the stamp, which served to guarantee the other two. Thus the *Book of the Eparch* made it obligatory on the *trapezites* to accept at its theoretical value of 24 obols the miliaresion τὸ ἀκίβδηλον τὸν βασιλικὸν ἔχον χαρακτῆρα καὶ μὴ παρακεκομμένον.[39]

A few rare texts apply an originally Coptic qualification—ὁλοκόττινο generally associated with gold—to silver coinage, which, as we will see, often retained a high level of purity, although its intrinsic value was not strictly aligned to its nominal value. Alongside this "real"-value gold coinage and a slightly overvalued silver coinage, there was also a bronze coinage of a fiduciary nature that made up the second specific feature of the monetary system. In fact, Byzantium had always known one or more bronze denominations, more precisely, copper (in most cases), billon (copper alloy with a low silver content), and even lead (the nominal value of which was generally higher than its intrinsic value), whereby the monetary ratio gold:copper generally varied between 1:630 and 1:924, as against a metallic ratio on the order of 1:1,200.[40] This type of

[37] *Basilics* 54.18.1 and 3; Novel 52 of Leo VI.

[38] *Obryzum:* see "Méthodes d'essai et d'affinage des alliages aurifères dans l'Antiquité et au Moyen Age," in C. Morrisson et al., *L'or monnayé,* vol. 1, *Purification et altérations de Rome à Byzance,* Cahiers Ernest-Babelon 2 (Paris, 1985) 2, 48, with references. Cf. M. K. Papathanassiou, "Metallurgy and Metalworking Techniques," *EHB* 124. On the purity of early Byzantine gold, see *"Aureus obryziacus,"* 90–108, and "La monnaie d'or byzantine à Constantinople purification et modes d'altérations (491–1354)," in Morrisson et al., op. cit. 121–24. *Holokottinos:* see R. Bagnall, *Currency and Inflation in Fourth-Century Egypt* (Atlanta, 1985), 15, 16.

[39] "If it [the coin] is of good alloy and bears the authentic imperial effigy." Although κιβδηλεύειν was used most frequently to designate manipulations of the fineness, and ἀκίβδηλον for metal that had not been debased, in this case, the adjective seems to me to apply to χαρακτήρ.

[40] T. Bertelè and C. Morrisson, *Numismatique byzantine, suivie de deux études inédites sur les monnaies des*

money had disappeared from the West between the sixth and the beginning of the sixteenth centuries, but in Byzantium, on the contrary, it served to endow the whole system with a degree of flexibility. It was undoubtedly this ability to adapt that enabled the system to surmount its many crises and to keep going for centuries.

The Evolution of the Monetary System at Constantinople Metrological characteristics (weight, fineness) are presented in Table 4 as approximate pointers to a situation that was often in flux, the details of which are found in the relevant reference catalogues and studies.[41] The pound weight used (324.72 g) is as estimated by statistical studies[42] and confirmed by the examination of uncirculated solidi from the Szikáncs hoard (ca. 450). Relations between denominations of different metals are also given on an indicative basis because they may have varied according to the date (e.g., the miliaresion varied between 1/12 and 1/14 of the nomisma), although the surviving sources say nothing about this (as was the case with the follis in the 7th century, for which we are reduced to combining values in carats recorded on papyri with its metrological evolution).[43] Large sums were expressed in multiples of 100 pounds (kentenarion, sometimes called talanton, from the original value of 100 Attic mnai). In the tenth to eleventh centuries, the talanton was synonymous with the pound.[44]

Table 4 presents only a sort of snapshot, giving an orderly picture of a situation that often fluctuated, with reforms being frequently accompanied by overlapping exchange rates between new and old coinages. The Byzantine monetary system had two main features. It was first and foremost a multidenominational system. Its structure was far more sophisticated than those of contemporary western coinages, which only featured the silver denarius and its half fraction, the obol, at least until the commercial revolution in the thirteenth century and the ensuing monetary evolution. It also demonstrated a great capacity for adapting, since every major monetary crisis was followed

Paléologues (Wetteren, 1978), 112–15. C. Morrisson, "La monnaie fiduciaire à Byzance ou 'vraie monnaie,' 'monnaie fiduciaire' et 'fausse monnaie' à Byzance," *Bulletin de la Société française de numismatique* 34 (1979): 612–16. For the metal composition of small change, see: P. Grierson, "Trace Elements in Byzantine Copper Coins of the 6th and 7th Centuries," in *Dona numismatica Walter Hävernick zum 23. Januar 1965 dargebracht* (Hamburg, 1965), 29–35; B. C. M. Butler and D. M. Metcalf, "Trace Elements in Byzantine Copper Coins," *NCirc* 75 (1967): 229–33; T. Padfield, "Analysis of Byzantine Copper Coins by X-Ray Methods" (with a Numismatic Commentary by P. Grierson), in *Methods of Chemical and Metallurgical Investigation of Ancient Coinage,* ed. T. Hall and D. M. Metcalf (London, 1972), 219–36; C. King et al., "Copper-based Alloys of the Fifth Century [395–530]," *RN,* 6th ser., 34 (1992): 54–76. For Byzantine lead coins, see C. Morrisson, "Monnaies en plomb byzantines de la fin du VIe et du début du VIIe siècle," *RIN* 83 (1981): 119–31, and eadem, "Les usages monétaires du plus vil des métaux: Le plomb," *RIN* 95 (1993): 79–101.

[41] *DOC, BNC, MIB,* Bertelè, CEB 2, Hendy, *Studies*.

[42] C. Carcassonne, *BSFN,* 1974, 620: 324.72 g. Relying on earlier French metrologists' studies from the 16th to the early 20th century, J. Lafaurie would now put it, like Guilhermoz, at 326.34 g (J. Lafaurie, "La livre romaine et ses modifications médiévales," *Société des Antiquaires de France. Bulletin* (1993): 95–100.

[43] C. Morrisson, "Monnaie et prix à Byzance du Ve au VIIe siècle," in *Monnaie* (as above, note 20), art. 3, pp. 247–50.

[44] See E. Schilbach, *Byzantinische Metrologie* (Munich, 1970), 173 and the 200,000 talanta of Basil II's hoard which cannot be kentenaria.

Table 4
The Byzantine Monetary System
(Constantinople Mint)

Roman and Byzantine metrological scale:

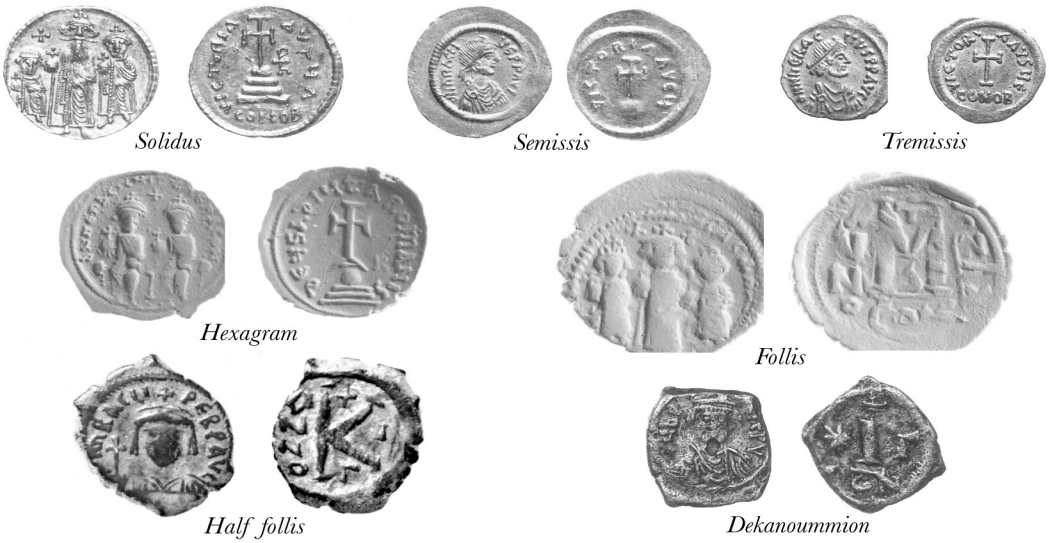
1 pound =	12 ounces =	72 solidi =	288 scruples	=	1,728 carats (keratia) ([a] 325 g)
	1 ounce =	6 solidi =	24 scruples	=	144 carats ([a] 27 g)
		1 solidus =	4 scruples	=	24 carats ([a] 4.5 g)
			1 scruple (or gramma)	=	6 carats ([a] 1.12 g)
					1 carat (or siliqua) ([a] 0.18 g)

Seventh Century, 602–717

GOLD			SILVER	COPPER		
Solidus nomisma	*Semissis*	*Tremissis*	*Hexagram*	*Follis*	*Half follis*	*Dekanoummion**
(~ 4.50 g 98% Au)	(~ 2.25 g 98% Au)	(≈ 1.50 g 98% Au)	(≈ 6.72 g 96% Ag)	(≈ 14 g to 3g)		
1	2	3	12	288	576	1,152
			1	24	48	96
				1	2	4

*The decline in the weight of the follis brought about the gradual disappearance of the pentanoummion (the last known examples are under Constantine IV, with one single example under Constantine V, *DOC* 10).

Note: Ag = silver; Au = gold. All coins are illustrated actual size.



Gold solidus of Herakleios, *DOC* 2.1: 33a
Gold semissis of Herakleios, *DOC* 2.1: 51a
Gold tremissis of Herakleios, *DOC* 2.1: 53a
Silver hexagram of Herakleios, *DOC* 2.1: 64.16
Copper follis of Herakleios, *DOC* 2.1: 96
Copper half follis of Herakleios, *DOC* 2.1: 72
Copper dekanoummion of Herakleios, DO acc. 73.29 [unpublished]

Table 4
(*continued*)

Eighth–Tenth Centuries

GOLD			SILVER		COPPER
Solidus/ nomisma	(*Semissis* *)	(*Tremissis* *)	*Miliaresion*	*Carat/keration* (money of account)	*Follis* [a]
(~ 4.50 g 98% Au)	(~ 2.25 g 98% Au)	(~ 1.50 g 98% Au)	(2.27 g to 3.0 g 98% Ag)		(from ≈ 14 g to 3 g)
1	2	3	12	(24)	288
				(2)	24
				(1)	12

continued

*Very rare after 741. Last known examples under Basil I (867–886).

[a] The dekanoummion disappeared under Constantine V, and the half follis disappeared for good under Theophilos.

Gold nomisma of Theophilos, *DOC* 3.1: 1a.2

Gold semissis of Theophilos, *DOC* 3.1: 6

Silver miliaresion of Theophilos, *DOC* 3.1: 8

Copper follis of Theophilos, *DOC* 3.1: 15c.2

Table 4
(*continued*)
Tenth–Eleventh Centuries, 963–1092

GOLD		SILVER			COPPER	
Histamenon nomisma	*Tetarteron nomisma*	*Miliaresion*	*⅔ miliaresion*	*⅓ miliaresion*	*Carat/keration* (money of account)	*Follis*
(24 carats-weight) (~ 4.50 g of 98% Au)	(22 carats-weight) (≈ 4.13 g 98% Au)	(3.0 g to 2.0 g of 98% to 65% Ag)	(2 g to 1.4 g of 98% to 61% Ag)	(0.9 g to 0.6 g)		(≈ 14 g to 3 g)
1		12	16	36	(24)	288
		1	1⅓	3	(2)	24
			1	2	(1⅓)	16
				1	(⅔)	8
					(1)	12

Histamenon nomisma

Tetarteron nomisma

Miliaresion

2/3 Miliaresion

1/3 Miliaresion

Follis

Gold histamenon nomisma of Basil II, *DOC* 3.2: 6a.7

Gold tetarteron nomisma of Basil II, *DOC* 3.2: 15b.4

Silver miliaresion of Constantine IX, *DOC* 3.2: 7a.1

Silver two-thirds miliaresion of Constantine IX, *DOC* 3.2: 8a.4

Silver one-third miliaresion of Michael VII, *DOC* 3.2: 13a

Copper anonymous follis (A2), *DOC* 3.2: A2.16.1

Table 4
(*continued*)

The Era of the Hyperpyron, 1092–1204

GOLD	ELECTRUM	BILLON			COPPER	
Hyperpyron nomisma hyperpyron	*Nomisma trachy aspron*	*Aspron trachy (stamenon)*	*Carat/keration* (money of account)	*Follis* (money of account)	*Tetarteron* (~ 4.0 g)	*Half tetarteron* (~ 2.0 g)
(~ 4.30 g ~ 87% Au)	(~ 4.30 g; 30 to 10% Au)	(~ 4.30 g; 6% to 2% Ag)				
1	3	48	(24)	(288)	864 ?	1,728 ?
	1	16	(8)	(96)	288 ?	576 ?
		4	(2)	(24)	72 ?	144 ?
		2	(1)	(12)	36 ?	72 ?
		1	(½)	(6)	18 ?	36 ?
				(1)	2	4
					1	2

continued

Hyperpyron

Aspron trachy (electrum)

Billon aspron trachy (stamenon)

Tetarteron

Half tetarteron

Gold hyperpyron nomisma of Alexios I, *DOC* 4: 20g.5

Electrum trachy aspron nomisma of Alexios I, *DOC* 4: 22.1

Billon aspron trachy (stamenon) of Manuel I, *DOC* 4: 10a.4

Copper tetarteron of Manuel I, *DOC* 4: 18.6

Copper half tetarteron of Manuel I, *DOC* 4: 22.26

Table 4
(*continued*)

The Era of the Hyperpyron, 1204–1304

GOLD	SILVER	COPPER	
Hyperpyron (~ 4.30 g)	Aspron trachy Trikephalon *Manuelatus*	Stamenon Aspron trachy	Tetarteron
(75 to 50% Au)	(~ 4.30 g ~ 95% Ag)	(~ 4.30 g)	(~ 2.20 g; 18/15 mm)
Concave	Concave	Concave	Flat
1	(12)	(288)	(576)
	1	(24)	(48)
		1	(2)

Hyperpyron

Aspron trachy / trikephalon

Aspron trachy (stamenon)

Tetarteron

Gold hyperpyron of Michael VIII, *DOC* 5: 21

Silver aspron trachy of Theodore I, *DOC* 4: El 1.1

Copper aspron trachy (stamenon) of John III, Thessalonike, *DOC* 4: Bill. 4.2

Copper tetarteron of John III, Magnesia, *DOC* 4: 56.1

Table 4
(*continued*)

The Era of the Basilikon, 1304–1367

GOLD	SILVER		BILLON	COPPER	
Hyperpyron	*Basilikon (basileo argyrion doukaton)*	Half basilikon *basileo/(argyridion?)*	*Tornese/ politikon*	*Stamenon/ Trakhion*	*Assarion* (tetarteron)
	(~ 2 g; 22 mm ~ 94%) (then ~ 1.10 g)	(1.3–1.0 g ~ 16 mm)	(~ 0.7 g ~ 17 mm ~ 22.5% Ag)	(~ 4.20 g) ~ 24 mm	(~ 2.1 g) ~ 18–22 mm
Concave	Flat	Flat	Flat	Concave	Flat
1	**12**	24	96	384	(768)
	1	**2**	**8**	32	(64)
		1	**4**	16	(32)
			1	**4**	(8)
				1	(2)

continued

Parentheses ( ) indicate estimated values for which there is no documentary evidence. **Bold** type indicates values taken from documentary sources.

Source: C. Morrisson, in *Geschichte und Kultur der Palaiologenzeit* (Vienna, 1996).

Gold hyperpyron of John V, *DOC* 5: 1193

Silver basilikon of Andronikos II, *DOC* 5: 533

Silver half basilikon of Andronikos II, *DOC* 5: 550

Billon tornese/politikon of Andronikos II, *DOC* 5: 555

Copper stamenon of Andronikos II, *DOC* 5: 763

Copper assarion of Andronikos III, *DOC* 5: 905

Table 4
(*continued*)

The Era of the Stavraton, 1367–1453

	SILVER (~ 95% Ag)				COPPER	
Hyperpyron (money of account)	*Stavraton stravato*	Half stavraton	*Doukatopoulon duchatelo/aspron*	*Kokkion/keration* (money of account)	*Tornese*	*Folaro*
	(~ 8.8 g)	(~ 4.40 g)	(~ 1.10 g)		(~ 2.4 g)	(~ 0.8 g)
1	2	4	16	24	**192**	(576)
	1	2	8	12	96	(288)
		1	4	6	48	(144)
			1	**1½**	12	(36)
				1	**8**	(24)
					1	(3 ?)

Parentheses ( ) indicate estimated values for which there is no documentary evidence. **Bold** type indicates values taken from documentary sources.

Source: C. Morrisson, in *Geschichte und Kultur der Palaiologenzeit* (Vienna, 1996).

Silver stavraton of John V, *DOC* 5: 1233

Silver half stavraton of Manuel II, *DOC* 5: 1325

Silver eighth stavraton (aspron) of Manuel II, *DOC* 5: 1589

Copper tornese of Manuel II, *DOC* 5: 1598

Copper folaro of Manuel II, *DOC* 5: 1603

by a stabilization process that lasted for longer or shorter periods, but always for at least a century: after the inflation of the follis and the disappearance of the hexagram in the seventh century, came the "era of the miliaresion" (8th–10th centuries); after the devaluation of first the gold coinage and then the silver coinage in the eleventh century, came the "era of the hyperpyron" (12th–13th centuries); and finally, after the fall of the gold coinage and the probable hyperinflation of the copper coinage in the fourteenth century, came the "era of the stavraton (silver hyperpyron)" (1367–1453).

The coinage of the seventh century retained the three traditional gold denominations that had existed since the fifth century: the solidus, semissis, and tremissis, which remained very pure (ca. 98%), as we have seen. Starting in the 680s, however, both the gold content and the weight were reduced (to 96% and 4.36 g on average instead of 98% and 4.41 g for the period 491–668). Only half of the weight reduction was due to the presence in the alloy of metals less valuable and less dense than gold. In terms of the fine gold content, the savings effected (4.20 g instead of 4.32 g) were small (2.7%), but not negligible. It is tempting to link these savings to the transformation of the tax system and the imperial finances that marked the decision to abandon the structures of late antiquity.

The sources are more revealing about the financial reasons leading to the resumption of silver minting, with the creation of the hexagram in 616. The name was derived from its weight, 6 grammata (scruples), and it was used "to pay the imperial *rogai* at half the old rate." As we know, it proved necessary in 621 to resort to the church's treasury to find enough precious metal to continue with this issue. If its value was indeed 1/12 of a solidus, the gold:silver ratio would have been 1:18; the nominal value would certainly have come very close to the metallic value. It has been supposed that the near-total absence of silver coinages in the East in the sixth century, as opposed to the abundance of worked silver in the same period, was due to the prices at which mints would buy the metal being far lower than those obtaining on the market. Conversely, the return to abundant issues of coins was ascribed to a more realistic value being assigned to money. However, the quantities struck declined swiftly at the end of Constantine IV's reign, and the hexagram became a "ceremonial" coinage that was struck to the solidus type, using solidus dies. Several theories have been advanced to explain this decline and disappearance: the difference between the gold:silver ratio in the Muslim and Byzantine worlds, which led to the flight of silver into the caliphate, or the loss of control over regions that supplied the metal, in the Balkans due to the Bulgarian advance and in Asia Minor due to the Arab armies and fleet.[45] The resumption of a silver coinage on a different basis, with the miliaresion, leads us to seek, at least in part, some internal cause, as Hendy proposed; probably an insufficient difference between the ratio of coined metals and the market ratio, similar to the one that operated in the same way during the sixth century.[46]

[45] P. Yannopoulos, *L'hexagramme: Un monnayage byzantin en argent du VIe siècle* (Louvain-la-Neuve, 1978).

[46] *Chronicon Paschale,* ed. L. Dindorf, 2 vols. (Bonn, 1832), 2:706; Theophanes, *Chronographia,* ed. C. de Boor, 2 vols. (Leipzig, 1883–85), 2:186 (hereafter Theophanes). Hendy, *Studies,* 278–79, 494–95;

A final feature of the seventh century was the constant decline in the weight of the follis, which decreased from an average 12 g under Phokas to 3.60 g ca. 660, while its value in carats slid from 1/20 to 1/40 in 621 and perhaps 1/96 ca. 660. Each particular debasement of the weight and nominal value of the follis was related to political and military vicissitudes.[47] A first attempt at restoring the coinage came under Herakleios with the return to the norms of around A.D. 600, coinciding with his victory in 629 and the relief that it brought to the empire's finances; it was not followed up, however. Constantine IV, for his part, reverted, with the folles of 527–538 and 550–565, to an earlier weight of 1/18 of a pound (18 g) and accompanied this measure with a retariffing of earlier specie, with the new half-folles bearing both the mark of their value K (20 nummi) and an M indicating that they were equivalent to the former folles. This measure appears to have been mainly political in nature and to fall within the context of the Justinianic renewal sought by the emperor.[48] As it was, it did not survive him, and by the end of the century the follis had fallen to its previous low weight. This lower weight is explained by the need to strike a growing number of coins at a time when the supply of copper was not elastic, as is demonstrated by various measures taken at the end of the sixth and in the seventh century, such as melting down statues, occasionally resorting to lead, and Constans II's seizure of metal from the roofs of churches in Rome. The haste with which the pieces were struck witnesses to the inflation; overstrikes, countermarks, blanks scissored by cutting the large pieces of former times into four. The fall in the purchasing power of low-value coinage can be followed with certainty, albeit too imperfectly, in the documents and is marked by the progressive disappearance of the subdivisions of the follis; there were no nummi after Maurice, and the last pentanoummia were those of Constantine IV.

Leo III inaugurated the "era of the miliaresion"; this name derives from the new silver money that was struck from 721 on, whose fabric (a large, thin flan), epigraphical type (five lines of inscription in the field), and metrology recall those of the contemporaneous dirham. The miliaresion was intended, if not to copy, at least to compete with the dirham on the political level, by confronting it with a profession of faith by the Christian empire, under the protection of God and the Cross. Although originally ceremonial in nature, the coinage soon exceeded this function; as early as 740 it was being demanded in payment for the *dikeraton* tax that had been created to finance the repair work to the walls of Constantinople.[49] On this occasion, the coin was valued at 1/12 nomisma, though it weighed half as much as a hexagram, and its nominal value was certainly greater than the market price for the metal. This explains why the surviving examples are extremely irregular with regard to weight and have often been clipped, a practice denounced in several passages in the *Book of the Eparch*. Attempts were made to prevent this by adding several circles of dots to the impression on the coin. Its fidu-

P. Grierson, "The Role of Silver in the Early Byzantine Economy," in *Ecclesiastical Silver Plate in Sixth-Century Byzantium,* ed. S. A. Boyd and M. M. Mango (Washington, D.C., 1992), 137–46.

[47] C. Morrisson, "Monnaie et prix à Byzance du Ve au VIIe siècle," in *Monnaie* (as above, note 20), art. 3, pp. 248–50.

[48] *BNC,* 1:375.

[49] Theophanes, 1:412.

ciary value certainly varied over the course of the miliaresion's history and explains its longevity (nearly four centuries): improvements to the weight have been noted, during the reign of Theophilos (3 g) and from that of Basil I (2.98 g), as well as variations in its nominal value. The ratio of 1 nomisma = 12 miliaresia = 288 folles, as confirmed by the *Palaia Logarike,* occurs at the end of the eleventh century in the *Glossai nomikai* and other scholia to the *Basilics;* it is implied in certain accounts in the *Book of Ceremonies* but probably rose to 14 by the end of the tenth century.[50] However imperfectly we are able to follow them, fluctuations of this kind witness to the system's adaptable nature.[51]

The miliaresion became the intermediary coinage par excellence in the system by replacing the divisions of the nomisma, which had become very rare since the reign of Constantine V and ceased under Basil I. The same simplifying process affected the low-value copper coinages. The divisions of the follis gradually disappeared during the eighth century, in spite of the episodic output of a half-follis scarcely distinguishable from the whole follis; the mark of value in nummi (M) became meaningless and gave place, under Theophilos, to an inscription running to several lines similar to that on the silver coinage. The result was the simplest possible trimetallic structure, with one denomination per metal. The appearance of one-third and two-third fractions of the miliaresion during the 1030s was undoubtedly a response to the need to facilitate transactions.

At the end of the tenth and in the eleventh century, money underwent a profound transformation, followed by a crisis. The devaluation affected all metals at different dates and according to different modalities. The gold coinage experienced a decline that can be divided into three phases, varying according to the rate and process of the debasement (see Fig. 2 and Table 5; for the processes, see pp. 943–46 and Fig. 3).

A gradual process of devaluation can be observed straightaway, from Constantine VII (914–959) to Michael IV (1034–41). During the period under consideration the proportion of silver in the gold coinage showed a very slight increase (an annual average of 0.04%). This increase was, however, almost continuous and could correspond—though this is an overestimate—to an increase of 0.2% per year in the money supply. It was during this first phase that Nikephoros II Phokas introduced a lightweight nomisma called the tetarteron, which was reduced by one-twelfth (*tetarteron* means "a small quarter," in relation to the full-weight nomisma, the histamenon). This complex phenomenon has given rise to an abundant literature in which the evidence provided by numismatics is compared with that supplied by historians of the time (Zonaras, Kedrenos).[52] According to the latter, "receipt of the tax was in heavy nomisma, whereas the smaller one was used for outgoing payments. Furthermore, although, according to law and custom, every nomisma struck from the

[50] Constantine Porphyrogennetos, *De cerimoniis aulae byzantinae,* ed. J. J. Reiske (Bonn, 1829), 1:799–800.

[51] *DOC* 3.1:62–68; Hendy, *Studies,* 500–506; N. Svoronos, *Recherches sur le cadastre byzantin et la fiscalité aux XIe et XIIe siècles* (Athens, 1959), 80.

[52] *DOC* 3.1:31–33, 37–38; 2:708–10; Hendy, *Studies,* 507–9.

Table 5
The Principal Stages in the Debasement of the Nomisma, 914–1092*

Reign	Dates	Gold (%)	Silver (%)	Copper (%)
Justinian II–Leo VI	695–912	97.3	1.99	0.7
Constantine VII	914–959	94.4	4.8	0.7
Michael IV	1034–41	90.0	7.0	3.0
Constantine IX Monomachos	1041–55	87.0	10.9	2.1
Romanos IV Diogenes	1068–71	70.0	24.8	5.2
Michael VII Doukas	1071–78	58.1	37.1	4.8
Nikephoros III Botaneiates	1078–81	35.8	56.6	7.6
Alexios I Komnenos (prereform)	1081–92	10.6	72.5	16.9

Source: Morrisson et al., *L'or monnayé* (as above, note 38).
*Average rates for the histamenon nomisma.

imperial die was, saving a reduction in its weight, equal in value, the emperor made a law granting a preferential rate to his nomisma."[53] According to H. Ahrweiler, this involved withdrawing previous nomismata and an attempt at stabilizing the nomisma at a lower weight, thus enabling the state to issue 8% more coins using the same quantity of metal.[54] Presumably, Nikephoros II was seeking in this way to substitute the gradual profit derived from manipulating the level of fineness with the sudden gain achieved simply by reducing the weight. Until ca. 1005, his successors continued, like him, to issue lightweight nomismata, distinguishable from histamena only by weight. Later tetartera, on the contrary, are perfectly recognizable in terms of typology and manufacture (thick flan and smaller diameter), but nothing is known about the conditions in which they circulated and about their market value. Whatever the case, they probably reveal the empire's efforts at paying at least part of its expenses in lighter coin.

The slow process of debasement was, however, (like the creeping inflation of paper money in our age) relatively more concealed and less painful, which explains why none of the sources from that period allude to it. Not surprisingly, the rate speeded up during a second phase from Constantine IX to Romanos IV—or, more exactly, to the middle of the latter's reign. Average silver content rose from 10.9% to 24.8%, an increase of 0.4% per year. If we adopt the unrealistic hypothesis that the entire previous output was melted down, this would have corresponded to an increase in the monetary

[53] Kedrenos, *Synopsis historion,* ed. I. Bekker, 2 vols. (Bonn, 1838–39), 2:369.
[54] H. Ahrweiler, "Nouvelle hypothèse sur le tétartèron d'or et la politique monétaire de Nicéphore Phocas," *ZRVI* 8 (1963): 1–9.

supply of more than 5% per year. However, it is more likely to have been on the order of 1% (or an increase by one-third in monetary units over thirty years).

In a final and most serious phase from 1071 to 1092, the gold fineness fell rapidly from 35.8% to 10.6% alone under Alexios I, whose "gold" coinage, albeit still containing a tenth of yellow metal, was in appearance no more than a silver coinage. The documents occasionally lay emphasis on the decline in its value,[55] which was due to the use of an alloy that included silver and copper instead of the native unrefined gold with a high silver content of the two preceding phases.

This method of debasement also explains why the gold content of the coinage fell so catastrophically. It was also responsible for the debasement of the silver coinage, whose fineness remained above 90% until the reign of Constantine X (1059–67) with no significant reduction until the reign of Romanos IV (1068–71) (first issue 90.7%, second issue 71% silver), falling to 45% under Nikephoros III (1078–81). In fact, both the silver and copper added to the nomisma were, on the whole, directly derived from the silver coinages of preceding emperors, and the sequence of these devaluations can be followed issue by issue. Consequently, there is no need to explain this debasement by referring to the silver "famine" in the Muslim East at this period.[56]

Copper coinage also experienced a devaluation, though our only available clue (following the brief return to the heavy standard of the 6th century under Basil II with the anonymous A2 class folles, part of which was struck at 15 or 18 to the pound) is the reduction in the weight of the follis from 24 to the pound (ca. 1028–1067) to 48 to the pound (1068–81), and even the striking of a lead coinage in 1092.

The reform of Alexios I Komnenos put an end to this crisis by restoring a gold coinage of high fineness, the hyperpyron, and by creating a new system destined to endure in its main features for some two centuries. The Komnenian system had the widest range known to Byzantium, after that of the sixth century (from 1 to 2,400 or 12,000 between the solidus and the pentanoummion or the nummus). Its slide toward lower values (the copper tetarteron was worth only a third of the preceding follis) reveals a desire to provide for the circulation of a coin with a weaker purchasing power. For both kinds of precious metal, the choice of fineness, respectively ca. 21 carats for the hyperpyron (instead of the 23 carats of the 9th to 10th centuries or the 22 carats at the beginning of the 11th century) and seven carats for the new white gold coinage (see Fig. 2) was due to the necessity to put back into circulation the existing stock of debased coinages with the least possible loss of metal. This also explains the closely connected disappearance of all silver coin that was more or less pure. The two levels of 21 and 7 carats did in fact correspond to the decision to melt down two sets of coinages, those from the beginning of the eleventh century (ca. 21 carats) and the

[55] *Actes de Lavra,* ed. P. Lemerle, A. Guillou, N. Svoronos, and D. Papachryssanthou, Archives de l'Athos, 4 vols. (Paris, 1970–82) 1: no. 53, 1. The sale of 3 modioi of vineyard and of 2 modioi of cleared land for *χρυσίου* διαχαράγματος νομίσματα τεσσαράκοντα καὶ πέντε τραχέα σταυροαγιοδημητράτα *τῆς τετρημμένης ποιότητος.*

[56] "La monnaie d'or byzantine de Constantinople," in Morrisson et al., *L'or monnayé* (as above, note 38), 137–39.

heavily alloyed issues of the last period. The system remained fairly stable throughout the twelfth century; the hyperpyron did not fall below 19 carats. The slide from the initial rate of 86% (20½ carats) that started with Andronikos I was accentuated under Isaac II and Alexios III but remained relatively limited. The trachy, on the other hand, was first debased during the reign of Manuel I, then under Isaac II, its intrinsic value falling to one-fourth and then to one-sixth of that of the hyperpyron. Finally, the silver-alloyed copper coinage, called *staminum* in Latin sources, saw its silver content fall from 6–7% under John II (1118–43) to 2–3% under Alexios III (1195–1203), and its value in relation to the hyperpyron fell from 1/48 in 1136 to 1/120 in 1190 and 1/184 in 1199 (Fig. 3).

After 1204 the empire of Nicaea was the only Byzantine state to emerge from the dismemberment of the Byzantine lands that struck a complete series of Komnenian denominations. Two transformations may be noted: on the one hand, the evolution of the pale gold coinage, the trachy aspron, into a pure silver coinage[57] and that of the silver-alloyed copper coinage into a pure copper coinage on the other, and above all the resumption of the debasement of the gold coinage which reduced it from around 17 carats (70%) during the period 1230–60 to ca. 11 carats (45%) within less than a century. Contemporaries were well aware of this process, as is shown by the figures cited in frequently quoted passages from Pachymeres and Pegolotti, which agree closely with the values established by analysis (Fig. 4). This phenomenon is well correlated with the empire's financial difficulties, which played a determining part in both this devaluation and in the diminished quantities struck from 1325 on. The decision purely and simply to stop minting the hyperpyron after 1353 was also linked to the international monetary context of the age. The different ratios between Byzantium and the Muslim world, on the one hand, and western Europe on the other, and the consequent export of metal coin between these zones contributed to the systems' double reversal: the return to gold in Italy (1252–84), and the decline as well as the difficulties involved in minting silver grossi in Venice in the 1320s and later.[58]

In 1304 the introduction of the basilikon, a pure silver coinage modeled on the Venetian ducat or grosso, accompanied or briefly preceded by that of the tournesion/politikon, a billon coinage (with ca. 22% silver), marked the abandonment of Komnenian structures under the influence of western prototypes.[59] However, the hierarchy and range of denominations remained comparable, insofar as we can tell from estimates that are often unsure about the relative value of the lower denominations. This was

[57] C. Morrisson, J.-N. Barrandon, and V. Ivanišević, "Late Byzantine Silver and Billon Coinage: A Study of Its Composition," in *Metallurgy in Numismatics,* ed. W. A. Oddy and M. Cowell, vol. 4 (London, 1997).

[58] C. Morrisson, "Monnaie et finances dans l'Empire byzantin, Xe–XIVe siècle," in *Monnaie* (as above, note 20), art. 4, pp. 311–15, with references. P. Spufford, *Money and Its Use in Medieval Europe* (Cambridge, 1988), 132–86, 267–88; F. C. Lane and R. C. Mueller, *Money and Banking in Medieval Venice* (Baltimore, Md., 1985), 314–18, 326–32, 347.

[59] P. Grierson, *DOC* 5.1:50, 142. C. Morrisson, "Les noms de monnaies des Paléologues," in *Geschichte und Kultur der Palaiologenzeit,* ed. W. Seibt (Vienna, 1996), 151–62.

also a feature of a system that began in 1367 (see *DOC* 5.1:50–51, 200–203) and was constructed around the stavraton, a heavy silver coin weighing more than 8 g, equivalent to twice the weight of fine metal of the last hyperpyra (4.2 g to 11 carats = 1.92 g gold = 17.3 g silver with a gold:silver ratio of 1:9). The stavraton and its subunits, which were almost as pure as the Venetian grosso, were slightly debased under John VIII, although, paradoxically enough, they recovered their original quality in the last issue of 1453.

Specific Features of Provincial Mints The uniform nature of the gold coinage was symbolized by the inscription CONOB on its reverse, irrespective of which mint was involved. We know that this statement was not merely for form's sake since the Pragmatic Constitution of Justinian (554) for Italy declared that "solidi struck from the Emperors' dies must circulate in all the provinces with no exchange costs" and specified that anyone contravening this rule was to pay his client another solidus for every solidus taxed in this way.[60] This uniformity dominated until the end of the seventh century, although respect for the capital's metrological norms (weight and fineness) did not prevent specific variations, which may possibly explain why people were suspicious, as indicated by the practices condemned in the document.

In Carthage, for instance, the coinage was systematically dated by regnal or indiction year, reflecting a different way of organizing production. Furthermore, starting with Maurice, solidi became increasingly thick, even globular. Thus the energy required to strike a coin diminished by a factor of 20 over a century, and numismatists can only speculate about the reasons for this particular way of economizing.[61]

The composition of the gold coinage remained uniform until the end of the seventh century, with provincial mints applying the same slight reduction in weight and fineness to the solidus as in Constantinople. The first deviation came in 695 at Syracuse; the fineness fell to ca. 80%, where it stabilized until a second and final devaluation between approximately 820 and 886, which turned the nomisma into a coin that was half copper (Fig. 5).[62] A comparable devaluation, albeit less well known with regard to detail or proceedings, affected the minting of Italian gold during the same period.

Silver coinage was almost nonexistent in the East during the sixth century, though forming a considerable part of the output from western mints at Carthage and in Italy, which kept to the traditions of the Vandals and Ostrogoths. It continued to play a role in Africa until the Arab conquest, although in a system structured very differently from that of Constantinople. Instead of a large and heavy denomination of 1/12 solidus (hexagram of ca. 25 mm and 6.72 g), it involved a series of small coins (12–10 mm or

[60] CIC, *Nov,* app. VII.20: "sancimus *solidos Romanorum principum forma signatos sine permutationis dispendio per omnes provincias ambulare et per eos celebrari contractus*."

[61] F. Delamare, P. Montmitonnet, and C. Morrisson, "Une approche mécanique de la frappe des monnaies," *RN* 26 (1984): 25–27; C. Morrisson et al., "A Mechanical Approach to Coin Striking: Application to the Study of Byzantine Gold Solidi," in *Monnaie* (as above, note 20), art. 13.

[62] Morrisson, "Nouvelles recherches," 275–78.

less, weighing some 0.70 g and 0.30 g, ⅓ and ⅙ of a siliqua?) that occupied the intermediary position between, on the one hand, fractions of the solidus and, on the other, the follis, both virtually nonexistent in Africa.[63] P. Grierson and W. Hahn estimate the theoretical value of the ⅓ siliqua at 5 folles, that is, 1/120 solidus (?).[64]

In Italy, silver was no longer as important as it had been in the seventh century; it was not struck at all in Sicily, where semisses and tremisses were issued in significant quantities until the ninth century. Ravenna still had a few rare coins of ⅛ siliqua (0.3–0.5 g, worth 3 folles according to Grierson) at the turn of the seventh century, whereas Rome constituted a special case by continuing to strike a "Byzantino-pontifical" coinage (ca. 0.25 g with a fineness that fell from 95% to 30%) until it came within the orbit of the Carolingian world in the 780s.[65]

The peculiarities of the bronze coinage of Alexandria and the western mints can also be noted. Right until the Arab conquest (and beyond with a series of Arab and Byzantine imitations), Alexandria maintained a system that kept to the original denominations of 12, 6, and 3 noummia. The 12-noummia pieces are the only ones that are very common. They constituted the bulk of Egyptian small currency and did not circulate outside the province. Despite the mark of value IB, occasionally the more explicit IBN (*DOC,* Herakleios, no. 190) or 12 noummia, it was probably considered equivalent to a follis of Constantinople in the seventh century, as suggested by the M that occurs between the I and the B on some coins of Herakleios (*MIB* 208–9) and of Constans II (*MIB* 188). At Carthage, the metrology of the coinage was different from that of the capital; the standard was higher, and the half-follis played the dominant role that, in Constantinople, belonged to the follis.[66] At Kherson, finally, a local bronze coinage was minted between the middle of the ninth and the beginning of the eleventh century. Its metrology was very diverse, since coins varied in weight between 2 and 7 g and in diameter between 10 and 25 mm, without it being possible to establish a hierarchy of denominations. The few analyses that have been carried out have established that the copper alloy had a high lead content (23–60%), pointing to the city's isolation and difficulty in securing metal.

The absence of any marks of value during the later period means that analogous comparisons cannot be drawn, though the denominations are clearly distinguished by manufacture and metrology. Thus, in the twelfth century, it is possible to compare an eastern or Constantinopolitan zone (including Thrace) where the stamenon ("billon trachy") dominated with a western zone (Thessalonike and especially Hellas-Peloponnesos)

[63] C. Morrisson, "Le rôle du monnayage d'argent dans la circulation africaine à l'époque vandale et Byzantine," *Bulletin de la Société française de numismatique* 44 (1989): 518–22.

[64] *DOC* 2:20; *MIB,* 3, 18.

[65] Morrisson (as above, note 20); A. Rovelli, "Emissione e uso della moneta: Le testimonianze scritte e archeologiche," in *Roma nell'alto medioevo,* Settimane di Studio del Centro Italiano di Studi sull'alto medioevo 49 (Spoleto, 2000), 821–56.

[66] *DOC* 2:29–30; C. Morrisson, "Carthage: Production et circulation du bronze à l'époque byzantine d'après les trouvailles et les fouilles," *BAntFr* (1988): 239–53.

where the tetarteron and even the half-tetarteron played a more important, even exclusive, role.[67]

The fact that the gold coinages from different mints evolved along divergent lines between the seventh and ninth centuries merely reflected the process by which the empire's western provinces were becoming increasingly distanced from its eastern core. As it is, the regional divergences affecting silver, billon, and copper coins, both in the seventh to ninth centuries and until the twelfth century, are evidence of the way that a local currency of a partial or entirely fiduciary nature could adapt to local conditions. Unfortunately, we can only observe this process of adaptation without being able to determine its causes. Various factors, such as the state of the market and of exchanges, price levels and the degree of monetization, as well as the ratio of gold to silver, probably came into play. Thus, in the sixth century, it can be deduced that there was a difference between prices expressed in folles in Africa and Egypt and those in the capital; it is tempting to correlate this difference with the system and metrology specific to each province.

Variations in the Money Supply (Sixth–Fifteenth Centuries)

The question of the money supply and variations to it is obviously basic to all economic research. By evaluating it, we can measure the development and wealth of the state and economy concerned. Apart from periodic discoveries of new mineral resources, relatively limited in time during the period that concerns us, which served to increase the quantities of available metal, positive variations were generally the result of an artificial multiplication of monetary units effected through devaluation. Conversely, any reduction in the money supply, whether due to external payments or to excessive hoarding during troubled periods, not forgetting permanent factors such as wear, attrition, and accidental losses, constituted a constant and much feared threat.

All research must obviously start from an estimate of the monetary production. Although documents about this certainly did exist in the Byzantine Empire, nothing has been preserved to match the monetary ordinances and mint accounts that enable researchers in the West to study in some detail the quantities of coin struck from the end of the thirteenth century on and to put forward coherent aggregates. Thus we are reduced, both for the early Byzantine and the later period, to refer to the specimens that have been preserved. Counting these is a very imperfect method because the number of pieces that survive is very seldom in proportion to the number originally issued, especially when dealing with precious metals that were minted in limited quantities and were hoarded in a very irregular manner. However, during the last three decades, numismatists have refined statistical methods for estimating the original number of dies that were used to strike a given issue. Assuming the random nature of the sample

[67] Hendy, *Studies,* 435–37; a detailed study by M. Oikonomidou et al., "Ο θησαυρός 'Κομοτηνής' / 1979: Συμβολή στην κυκλοφορία των τεταρτηρών του ΙΒ' αι. μ. Χ.," *First International Symposium for Thracian Studies, "Byzantine Thrace": Image and Character,* ed. C. Bakirtzis, vol. 1 (Amsterdam, 1989), 367–428 (= *ByzF* 14.1 [1989], 367–428).

studied, these estimates allow us to compare the relative size of the issues. A further stage can even be reached; by formulating hypotheses about the average number of given pieces that could be struck per die, figures can be suggested for the volume of coin minted, on the basis of such fragile foundations.

Since analyzing the dies for any given output is a lengthy process, which involves comparing all the examples individually and achieves uncertain results, few studies of this kind have been undertaken for Byzantine coinage. So we need to be cautious about an edifice of hypotheses, on which estimates about the quantities struck are based, and to guard against the dangers of reproducing or using them, thus giving them an absolute value that they do not in any way possess. I need only observe that during the early Byzantine period, the few available estimates for issues in the capital—their very abundance discourages any study of the dies—are between ten and five times higher than estimates for provincial mints, which is not unlikely. I should also point out that the variations in the number of dies estimated for the solidi of Constantinople in the seventh century correspond with the historical context when they show an annual production that doubled during the years of war effort (610–632: 1,430,000 solidi?) compared with that of the previous ten years (602–610: 840,000 solidi?) or the following decade (632–641: 750,000 solidi?). Insofar as this estimate for the volume of output is credible, although certainly an overestimate, it is not entirely incompatible with the estimates put forward for the Byzantine budget in the sixth century. It also makes sense when set alongside the figures for issues known from documents for medieval and modern states. For the middle Byzantine period, the iconoclastic corpus offers results that could indicate an annual minting of some 250,000 to 300,000 nomismata (?),[68] representing a tenth of imperial revenues. The estimate for Constantine VII (260,000) is at first sight low but is based on a far less important corpus (186 examples over forty-five years instead of 1,170 over eighty-six years) and a more delicate use of statistics. As for the surprising difference that has been observed between the estimates for Alexios I (570,000 hyperpyra) and Manuel I (40,000 hyperpyra) to the detriment of the latter, it is far from established, given that it is derived from too limited a base.[69]

Even if one were able to estimate without too much uncertainty the volume of output, the task of piecing together the evolution of the money supplies would not be made much easier, as is demonstrated by the obstacles that crop up in more recent and better-documented periods, such as the eighteenth or nineteenth century in France. In fact, this would require taking account of many other factors, about which not much

[68] C. Morrisson, "Changes in the Stock of Monetary Bullion in Byzantium," in *Coin Production and Sources of Bullion, 4th–10th Century,* ed. M. Barcelò and M. Blackburn, forthcoming (an up-to-date report on proposed estimates for monetary production during certain reigns). F. Füeg, "Die Solidus-Ausgaben 720–797 in Konstantinopel," *Revue suisse de numismatique* 70 (1991): 35–74; idem, "Vom Umgang mit Zufall und Wahrscheinlichkeit in der numismatischen Forschung," ibid., 76 (1997): 135–60.

[69] Metcalf, *Coinage in South-Eastern Europe, 820–1396* (London, 1979), 109, acknowledges this: "an estimate based on a proper corpus of Manuel's coins remains a desideratum, before one regards the contrast with Alexius' 8 to 10 million hyperpyra as an established fact."

is known either. Among these are total or annual rates for reminting coins, which would require estimating the average life span of a coinage. This, however, seems to have varied over time and space, when estimates for the gold coinage are based on the chronological span observed in hoards that are considered representative. It changed from about thirty years in the fourth century to sixty to eighty years for the gold money of Constantinople in the seventh to fourteenth centuries, whereas in Carthage, on the other hand, it fell from around eighty years in the sixth century to thirty-eight years in the eighth century.[70]

A further essential factor for estimating the supply is the wastage of metal in circulation as a result of wear on coins, accidental loss, and, finally, hoarding. Wear depends on both the properties of the metallic alloy and the conditions under which money circulates. All things being equal, it is in proportion to the length of circulation. Its rate is modified by any change to the alloy and by any variation in the intensity of the circulation.[71] Assuming that the latter was stable and knowing that the composition of the solidus did not vary during this period, F. Delamare has been able to estimate the annual weight loss for the seventh-century solidi of Constantinople, found in the Rougga hoard, at 0.44 mg, that is, ca. 0.01% of their legal weight. This figure is similar to those that the Monnaie de Paris and the Royal Mint arrived at in the nineteenth century for gold pieces (0.014% for the napoleon in 1824–50, and 0.019% in 1854–88, and 0.034% for the sovereign). However, we must be wary of drawing fallacious analogies, because these modern types are three times more durable than the aureus or the solidus, and weight loss over time is only comparable in cases where the alloy is similar and where the susceptibility to corrosion is known.[72] What is more, few Byzantine hoards have been studied in this respect, and it is impossible to generalize. Wastage may have played a more important role, but it can only be estimated on a very dubious comparative basis. Statistical surveys were conducted in the United Kingdom during the 1960s prior to the decimalization of the coinage in 1971, which showed annual rates of 3.3%, 0.6%, 1.5%, and 1.8% for the halfpenny, penny, threepenny, and sixpenny coins respectively, without any clear hierarchy emerging, although London, the south, and southeastern regions showed higher levels of wastage.[73] Even though these

[70] J.-P. Callu, "Structure des dépôts d'or au IVe siècle (312–392)," in *Crise et redressement dans les provinces européennes de l'empire (milieu du IIIe–milieu du IVe siècle ap. J.-C), Actes du Colloque de Strasbourg, Déc. 1981,* ed. E. Frézouls (Strasbourg, 1983), 157–74. See C. Morrisson (in R. Guéry et al., "Etude numismatique," *Recherches archéologiques franco-tunisiennes à Rougga,* vol. 3, *Le trésor de monnaies d'or byzantines* [Rome, 1982], 66) for a comparison between Carthage and Constantinople in the 7th century. The hypotheses on which G. Depeyrot bases his conclusion about the life span of solidi ("La durée d'utilisation des solidi romains," in *Studia numismatica labacensia: Alexandro Jeločnik oblata,* ed. P. Kos and Z. Demo [Ljubljana, 1988], 213–17), setting it at 30 to 35 years for solidi in the 5th century, are not obvious. Most notably, his calculation of an average rate of wear to be 2 mg per year has been superseded by the theoretical and experimental study by F. Delamare, *Le frai et ses lois: The Wear of Coins,* Cahiers Ernest-Babelon 5 (Paris, 1994), 198–99. See also R. Bland, "The Changing Patterns of Hoards of Precious-Metal Coins in the Late Empire," *An Tard* 5 (1997): 29–55.

[71] Delamare, *Frai.*

[72] Ibid., 99, 269.

[73] T. J. Cole, "Geographical Variation in the Wastage Rate of Modern United Kingdom Coinage," *Statistique et numismatique,* ed. J. Guey and T. Hackens (Strasbourg, 1981), 309–16.

rates applied to coins with the lowest purchasing power, the geologist L. L. Patterson proposed an average rate of 2% for the entire money supply of antiquity and the Middle Ages, a rate that would have resulted in the disappearance of nine-tenths of any specific supply over a century, and appears to be an overestimate. J. H. Munro estimates the wastage rate at between 0.2% and 1% during the later Middle Ages.[74]

Hoarding could effect a serious reduction in the money supply, especially in troubled periods when a greater number of hoards was never recovered than was the case in ordinary times, since "all memory of them had been lost."[75] As a general rule, even in a peaceful context, as in Constantinople during the tenth century, hoarding (θησαυρίζειν) was forbidden, as the possible cause of lack of coin (νομίσματος ἔνδεια), which was always feared.[76] In the same way, the Byzantine government always tried to implement measures that favored the return to circulation of coins that had been buried in hoards.[77] We would like to know the extent of hoarding, in other words, of the Byzantine population's involvement in unproductive savings. What proportion of their property was stored in coin form? Such wills as have survived seldom enable any estimate of this or any kind to be made, though some do provide a few figures:[78] 20–25% of coins and objects in the will of Boilas; 12 pounds of gold in coin in the case of Gregory Pakourianos in 1090, that is, 12% of his capital, if each of his four *proasteia* was also worth the 25 annual pounds of gold that J.-C. Cheynet has estimated for Radolibos; two-thirds of the coins (according to Cheynet, or 40% if one estimates legacies in coin at 119 pounds instead of Cheynet's 100 pounds) in the patrimony of Kale Pakouriane in 1098. In 1314 the property of the Thessalonike landowner Theodore Karabas—for which I provide a rough estimate on the basis of known price series—consisted basically of town houses (13 ≅ 130 hyperpyra), a village house, and vineyards (61 modioi ≅ 854 hyperpyra). Karabas also had 300 measures of wine (≅ 30 hyperpyra), 30 tetartia of wheat (≅ 12 hyperpyra), 10 tetartia of millet (≅ 1.5 hyperpyra), an ox and a half a cow (≅ 5 hyperpyra), movable goods in the form of clothes and jewels (≅ 70 hyperpyra, of which ≅ 20 hyperpyra in jewels), and the anticipated produce of various pieces of land sown with wheat (≅ 7.5 hyperpyra). The 52 ducats that he left to cover his debts (17.5 hyperpyra) and various money legacies (56 hyperpyra),

[74] L. L. Patterson, "Silver Stocks and Losses in Ancient and Medieval Times," *EcHistR,* 2d ser., 3 (1972): 203–35, criticized in Grierson, "The Role of Silver," 139–40. J. H. Munro, "Monetary Contraction and Industrial Change," in *Coinage in the Low Countries, 880–1500,* ed. N.J. Mayhew (Oxford, 1979), 99.

[75] The extent to which a coin issue is represented by its recorded finds today may present a (minimal) measure of its rate of nonrecuperation during the medieval period. D. M. Metcalf, for instance, estimates the survival rate for tens of millions of silver gros struck at Cyprus at one or two in every thousand (D. M. Metcalf and A. G. Pitsillides, "Studies of the Lusignan Coinage," Ἐπετηρὶς τοῦ Κέντρου Ἐπιστημονικῶν Ἐρευνῶν 19 (1992): 4–5.

[76] See Novel 52 of Leo VI and several passages in the *Book of the Eparch;* C. Morrisson, "Manier l'argent à Constantinople au Xe siècle," in *Eupsychia: Mélanges offerts à Hélène Ahrweiler,* 2 vols. (Paris, 1997), 2:557–65.

[77] C. Morrisson,"La découverte des trésors à l'époque byzantine théorie et pratique de l'εὕρεσις θησαυροῦ," in *Monnaie* (as above, note 20), art. 7.

[78] J.-C. Cheynet, "Fortune et puissance de l'aristocratie (Xe–XIIe s.)," in *Hommes et richesses dans l'Empire byzantin,* 2 vols. (Paris, 1989–91), 2:199–213.

represented some 78 hyperpyra, or rather less than 7% of his total assets (≅ 1,191 hyperpyra).[79] Finally, in 1384, Maria Deblitzenes dowry,[80] originally worth 22 pounds of gold in total (1,584 hyperpyra), included 500 hyperpyra (διὰ χαράγματος) or 31%, a percentage that is all the more credible in that all the goods are valued in the text. Leaving aside the fact that money, as a general rule, featured more largely in women's legacies (31–40% in the examples cited here),[81] one can observe that around 25% of the entire capital probably represents the proportion of liquid funds required by landowners, both to meet their ready cash needs and as a reserve for emergencies. This ratio contrasts, for instance, with the extreme case of Pasino degli Eustachi's legacy, 77.6% of which consisted of coins and only 10% of land. He had been a wealthy Milanese merchant living in Pavia during the fifteenth century, and coins were the tools of his trade.[82] All these metal reserves were, of course, coveted by the state, which often confiscated them in times of shortage.

However, the state also accumulated reserves of metal whenever it could, and we do have some figures for hoarding by rulers,[83] who were either, like Anastasios, praised for their parsimony, or, like Constantine V, blamed, both for their avarice and for the perverse, clearly deflationary results. Arranging these figures into a table (see Table 6) in order to compare them to various estimates of the imperial budget and to deduce averages is a dangerous exercise, for various reasons: the uncertain nature of the data; the arbitrary way in which annual savings are estimated for the duration of the only reigns considered; the empire's constant vicissitudes and the ensuing variations in its finances. I simply note how Anastasios' prudent management, which is often cited as an example, resulted, thanks to an annual surplus of about one-seventh, in stocks representing more than three times the current budget, and that Basil II's exceptional funds amounted to three times as much again.

What, apart from these reserves, which, as we know, consisted partly of coins and partly of ingots, were the sources of coined metal?[84] New metal appears to have made but a very limited contribution to renewing the money supply. However, by measuring trace elements in the alloy of gold and silver coins and the way they evolve (increase

[79] See the commentary in *Actes de Chilandar,* ed. M. Živojinović, V. Kravari, and C. Giros, Archives de l'Athos (Paris, 1998), 211–12; cf. A. E. Laiou, "The Agrarian Economy, Thirteenth–Fifteenth Centuries," *EHB* 360–61.

[80] *Actes de Docheiariou,* ed. N. Oikonomides, Archives de l'Athos (Paris, 1984), 49.

[81] Cf. J.-C. Cheynet, "Aristocratie et héritage," in *La transmission du patrimoine: Byzance et l'aire méditerranéenne,* ed. J. Beaucamp and G. Dagron (Paris, 1998), 59–60.

[82] C. Cipolla, *Before the Industrial Revolution,* 3d ed. (London, 1993), 35. The coins amounted to 92,500 ducats = 326.5 kg of gold, to which were added jewels worth 2,225 ducats.

[83] References and commentary in Hendy, *Studies,* 224–26.

[84] Naturally, Psellos responds in rhetorical terms to this question (*Accusation de Cérulaire,* ed. J. Bidez, in *Catalogue des manuscrits alchimiques grecs* [Brussels, 1924–]), 6:78: οὐ γὰρ ἐκ μετάλλων μόνον οὐδ' ἀπὸ τῶν τῆς γῆς μυχῶν ὁ τοῦ βασιλέως ἐπιδίδωσι θησαυρός. οὐδὲ φόροι τοῦτον πλήθουσι μόνοι καὶ γεωδαισίας συντέλειαι, καὶ οὐδ' ὁ βοηλάτης αὐτῷ λειτουργεῖ μόνος, ἀλλ' οὐδὲν ἧττον καὶ ὁ χρυσελάτης καὶ ὁ τὸν καττίτερον ἐλαύνων καὶ ὁ τήκων τὸν μόλιβδον. For mines, see K.-P. Matschke, "Mining," *EHB*, and B. Pitarakis, "Mines anatoliennes exploitées par les Byzantins: Recherches récentes," *RN* 153 (1998): 141–85.

Table 6
Accumulated Reserves and Imperial Budgets, 402–1025

Dates	Reign	Accumulated reserves (in nomismata)	Estimated budget (in nomismata)	% Reserves/ budget	Savings/year (in nomismata)	Savings/ annual budget (percent)
402–457	Theodosios II	7,200,000	5,000,000	144%	130,909	2.6
			6,000,000	120%		2.1
			7,000,000	102%		1.8
491–518	Anastasios	23,040,000	5,000,000	460%	853,333	17
			6,000,000	380%		14
			7,000,000	330%		12
741–775	Constantine V	3,600,000	1,700,000	211%	102,857	6.0
829–856	Theophilos	7,200,000	2,800,000	257%	266,667	9.5
	then Theodora		3,300,000	218%		8.1
976–1025	Basil II	14,400,000	4,000,000	360%	369,230	9.2
			5,000,000	288%		7.3
			6,000,000	240%		6.1

or decrease in a specific element), it is possible in certain cases to detect the appearance of a metal from a different origin, whether derived from new mines or imported. With regard to the gold coinage of the seventh to fifteenth centuries, J. Poirier has estimated the annual rate of renewal in the long term at 1%.[85] Starting from the same data, A. Guerreau has produced an improved model and estimates this rate at no more than 0.34%.[86] He proposes a distinction between several phases: between 550 and 900, the reduction in the rate from 450 to 280 parts per million implies a rate of 0.14%, and a greater reduction between 900 and 950 signifies a faster rate of renewal prior to a return to the original rate of 0.14%. The same data for the reign of Alexios I Komnenos and others concerning the empire of Nicaea suggest a partial recourse to new metal, which is hard to quantify.[87]

In the case of silver, A. A. Gordus and D. M. Metcalf have shown variations in the gold traces that could be significant;[88] pieces with a low gold content were concentrated under the reign of Constantine VI and may have been struck from metal that was originally Arab, to the extent that some of them have been restruck on dirhams. The authors tend to think that, since the political context of the age excluded the payment

[85] J. Poirier, in Morrisson et al., *L'or monnayé* (as above, note 38), 84, fig. 35.
[86] A. Guerreau, *Histoire et mesure* 1 (1986): 258–59.
[87] Morrisson et al., *L'or monnayé* (as above, note 38), 155, 158–60.
[88] A. A. Gordus and D. M. Metcalf, "The Alloy of the Miliaresion," *HBN* 24/26 (1972) [1977]: 9–36.

of tribute to Byzantium, the arrival of this metal could have been linked to the peace that was instituted in 781 and the reduced customs duties at Hieron and Abydos. Inversely, pieces with higher gold traces could have been struck from metal from the mines of Armenia. As may be seen, the question of the provenance of the metal is one of those that have only recently been addressed by modern methods of analysis, and the answers are still very inadequate. These methods have at least been able to confirm the conclusions outlined by S. Vryonis in 1962, and developed here by K. P. Matschke: the Byzantines did indeed have access to mines and sources of metal.[89]

Insofar as we can judge, however, our period never witnessed an influx, of gold at any rate, comparable to the one that made possible the monetary enrichment of the late empire in the fourth century. Our only assumption is that this contribution of newly extracted or imported metal was in the long term sufficient to compensate for the various forms of wastage (wear and accidental losses or lost hoards) and produced an increase in the money supply only very episodically, as in the case of Nicaea in the thirteenth century.

The Inelastic Metal Supply and Remedies Faced with an inelastic metal supply, the state resorted perforce to a variety of expedients when it needed to restore a balance between inadequate receipts and levels of expenditure, which were generally very resistant to any reduction, although instances of drastic adjustments and savings (such as the abolition of free bread distribution or the reduction by half of all the *rogai* under Herakleios) are not lacking over the years. In fact, there simply was not a sufficiently developed banking system capable of advancing the considerable sums required by the imperial finances when in difficulties. It is only in the fourteenth century that we can see the empire resorting to loans from foreign institutions. The first case was in 1343, when Venice accorded Anna of Savoy and John V a loan at 5% over three years, of 30,000 ducats, paid in hyperpyra by the Venetian merchants of Constantinople, and secured against the crown jewels, rubies, and tiger rubies weighing 31 exagia and 12 carats (equivalent to 609 g) in total. The debt was not repaid, and the jewels remained in Venice's possession until the fall of the empire.[90]

Between the eighth and eleventh centuries, the *rogae,* or "state rents," had supplied a permanent source of liquid assets at reduced cost. In times of crisis, this cost could be reduced still further by cutting back or suppressing payments. However, there is some doubt about the system's flexibility and its ability to provide large sums instantly, nor is there historical evidence for this. On the other hand, the sources are full of instances of resorting to metal reserves, the coins and objects made of precious metal belonging to institutions or individuals: this involved melting down tableware, statues,

[89] Matschke, "Mining," 115–20.

[90] T. Bertelè, "I gioielli della corona bizantina dati in pegno alla repubblica veneta nel sec. XIVe Mastino II della Scala," *Studi in onore di Amintore Fanfani,* 6 vols. (Milan, 1962), 2:89–177. For other loans taken out by the Palaiologoi, see ibid., 137–38, n. 64; the last one of these amounted to 9,000 hyperpyra loaned by Genoese merchants to Constantine XI in January 1453, and also mortgaged against a tiger (balas) ruby.

crown jewels or worse, ornaments buried in imperial tombs, implementing loans or confiscations of church treasuries, and, obviously enough, enforced loans or confiscations of private fortunes.[91]

Before resorting to such extreme measures, it was possible to develop or extend the use of quasi- or substitute money. On the borderlines between metal money and money of convenience, this lead coinage of minimal or almost no intrinsic value appeared when the current coinage was affected by inflation (late 6th and late 11th centuries) or in isolated regions (Kherson). The example of the leather coinage that Constantine V is supposed to have issued in 743 for his troops under the walls of Constantinople is one of a classic obsidional or siege coinage.[92] The characteristic and most widespread quasi-money in the economic history of Byzantium is, of course, silk, the constant complement to *rogai* in coin, but which could, when needed, replace the latter wholly or in part, as it did in 1071.

The most current and "softest" solution lay in manipulating the coinage, using the various processes of debasement and devaluation that western authors in the Middle Ages distinguished under the terms *mutatio in materia* or *in pondere,* on the one hand, and *mutatio in appellatione* on the other.[93] The first processes were applied especially to precious metal coinages in gold and silver and the second to low-value coins.

A reduction in the weight of a type was detected sooner when it was too marked, as was the case with the tetarteron, and produced inevitable reactions; so this solution was rarely adopted. However, I should note that the average observed weight of the nomisma experienced a tendential reduction, from ca. 4.45 g in the sixth century to 4.35 g in the tenth to eleventh centuries, and to ca. 4.30 g in the twelfth century.[94] It is not possible to measure the reduction any later than this, because it is clear that the coin weight of specimens was not adjusted *al pezzo,* as it had been previously, albeit less carefully from the twelfth century on, as is shown by the greater incidence of variance (3.6% between 491 and 1081 and 3.7% between 1081 and 1203, but 4.7% in 1222–54, 6.5% in 1258–82, and 8–11% between 1295 and 1328). E. Schilbach's conclusion was that, during the later period, "in relation with devaluation, they moved away from the old ratio of 1 gold pound = 72 nomismata."[95] However, it is difficult to concede that

[91] Hendy, *Studies,* 228–31. On the "roga," cf. Oikonomides, "The Role of the Byzantine State in the Economy," *EHB* 1008–11.

[92] *Gesta episcoporum Neapolitanorum,* chap. 39, cited by W. Brandes, *Die Städte Kleinasiens in 7. und 8. Jahrhundert* (Berlin, 1989), 147: "ne in tantam multitudinem [the crowd of his troops and partisans] famis adcresceret, *corii solidos pro aureis nomismatis fecit a negotiatoribus dari et recipi,* promittens eos, dum in palatio introiret, omnes colligere et aureis solidos ad corii solidos commutare. Constanter autem obsidentibus urbem, hii qui intra civitatem erant veniam impetrantes, cum gloria ab omnibus receptus est. Ingresso Constantino palatio, promissum quod de solidos fecerat, explevit."

[93] Introduction—and slightly outdated presentation of facts: C. Morrisson, "Alterazioni e svalutazioni," in *La cultura bizantina, oggetti e messaggio: Moneta ed economia,* ed. A. Guillou et al. (Bari, 1979), 63–119.

[94] "La monnaie" (as above, note 38), 165–67, 248–50; E. Schilbach, *Byzantinische Metrologie* (Munich, 1970), 166–68.

[95] Schilbach, *Byzantinische Metrologie,* 173.

they could so easily have abandoned such an essential constant. Although this is not the place to dwell on the weight of the pound, the pivot of Roman and Byzantine metrology, it can be admitted, as several scholars have done, that this weight slid progressively from the estimated 325 g of the fourth to sixth centuries, about which we are nowadays agreed, to 318.7 g and even 304 g at the end of the empire.[96] With the exception of a few oscillations that are more marked in one way or another, under such and such a reign and for such and such an issue, which were in fact manipulations, this phenomenon amounts rather to a secular slide resulting from the impossibility of maintaining immutable standard weights in the absence of any physical definition of the masses involved.

Debasing the fineness was thus the most currently employed means of multiplying monetary units when the metal supply was limited. The proceedings employed were more complex than historians tend to think, and they cast some light on the context of debasement and its consequences. Determining the lead trace element has enabled J.-N. Barrandon to differentiate between "natural alloy" and "artificial alloy," in other words, between coinages struck in native unrefined gold in which the silver content can vary from a few hundredths to 30% or slightly more, depending on the composition and proportion of the mineral used, and coinages that were "devalued" or, rather, debased by the deliberate addition of silver and copper.[97]

Prior to 1070, the increased proportion of silver in the gold coinage (from 5% to ca. 25%) constituted an undeniable debasement, but it was relatively less harmful than that of the following period, insofar as it implied access to sources of new metal and offered the possibility of substantially increasing the number of types struck, theoretically by a factor of three, without crossing the tolerance threshold, since the yellow color remained unchanged. After 1070, debasement was effected by the addition of silver from the miliaresia that were being returned in payment of taxes, and then by the addition of silver and copper, in line with the debasement of these very miliaresia with copper, which were then "recycled" into gold coins. This process of "artificial alloy" involved a far lower increase in the number of coins struck than the preceding process and explains, as we have seen, the catastrophic nature of this devaluation which operated, so to speak, within a closed circuit. Though, at the close of the eleventh century, the sources of the alloy metal are clear and even identifiable, issue by issue, this does not apply to the Sicilian solidi of the Amorian dynasty. The model only shows that, starting in 830, they were adulterated either with coins composed of 20% silver and 80% copper, or with one part silver for every four parts copper. Since small change of this fineness did not exist in Byzantium or elsewhere at that time, they must have resorted to pure metal (derived from mines, tableware, or coins that had been refined and then returned to the melting pot).

[96] Entwistle, "Byzantine Weights," 611.

[97] "Les méthodes d'analyse des monnaies d'or," in Morrisson et al., *L'or monnayé* (as above, note 38) 33–34, and passim. J.-N. Barrandon, "Modélisation de l'altération de la monnaie d'or," *RN,* 6th ser., 30 (1986): 7–26.

Toward the last days of the empire, the final devaluation of the hyperpyron, at Nicaea and under the Palaiologoi, followed a similar process, with simpler proportions that were not fortuitous. Gold was replaced with a mixture of silver and copper in perceptibly equal proportions (11% silver + 11% copper under Michael VIII; 16–18% silver + 16–18% copper at the beginning of the 14th century). This method of debasement was more efficient because it involved only a slight color change, from yellow to yellowish, despite a considerable reduction in the fineness (from 70% to 45%). It could be thought that this choice stemmed from the experience of the eleventh century; the devaluation of the 1070s and 1080s had been the first in the history of the coinage to reduce the fineness so drastically, if one excludes the marginal cases in Rome and Sicily in the eighth to ninth centuries, which probably had little impact on collective memory. That the lesson had been learned and possibly even exported is shown by the *bizantii saracenati* issued at Acre, Tyre, and Tripoli in the thirteenth century, which adopted the same process.[98] It explains how, between 1325 and 1353, in spite of the civil war and the financial crisis, the limit of 11 carats was never crossed. Although the color was only a matter of appearance and illusion, it nevertheless enabled the hyperpyron to fare better than the nomismata of comparable fineness issued by Michael VII and his successors, which became aspra trachea.

Devaluing the coinage in the proper sense of the term meant to alter its legal value without necessarily modifying its physical characteristics. Depreciations of this kind were frequently implemented and were well known in the West as well as the Muslim world during the Middle Ages and in the modern age. The Roman Empire also devalued, but the sources do not enable us to follow the process in detail in Byzantium. If the theoretical value of the solidus is likely to have remained fixed at 1/72 to the pound, its ratio to other coins did undergo some changes. Some of these are deliberately recorded, as in the sixth century when Prokopios mentioned the passage of the solidus from 180 to 210 folles; others have been deduced from written sources, as we have seen in the cases of the follis in the seventh century mentioned in papyri[99] and the miliaresion of the tenth century, though still others will doubtless remain hidden forever.

One may surmise that, during the late period, particularly under the Palaiologoi, the constant practice of changing the types, which affected the whole currency, was linked to a system of *renovationes,* decrees accompanying a change in value and/or the levy of *seigniorage* (the profit drawn by the sovereign on the manufacture of these new coinages). A famous passage in the account by Agathangelos explains how the traveler, on his return to Constantinople in 1351 with ten "gold nomismata" in his pocket, had changed them into cash (λεπτότερα μέρη τῶν νομισμάτων) in order to carry out his daily purchases more conveniently, a transaction he soon regretted for, as he says, when he visited the merchants the next day, "I found that the money in my hands had fallen and taken such a drop that in a single day the value of my ten nomismata had fallen

[98] J.-N. Barrandon, M. Bompaire, and C. Morrisson, "The Crusader Besant: Processes of Debasement," in *Metallurgy in Numismatics* (as above, note 57), 35–51.

[99] On the follis and the solidus, see Morrisson, "Alterazioni," 111–19.

to eight."[100] This passage is generally interpreted as an instance of hyperinflation in the copper coinage, which is not entirely impossible in times as troubled as those, but so sudden and important a depreciation (20% in twenty-four hours) is better explained in terms of a devaluation by the authorities. The Byzantine bronze coinage had suffered devaluations of this kind for a long time, and the troubles to which they could give rise are illustrated in this account by Malalas about the devaluation in 553 and its repeal in the face of popular opposition: "In the month of March, first indiction, there occurred a mutation of the small change. An uprising by the poor ensued and a riot which were reported to the emperor. And the latter ordered that the official value of the small change should conform to the previous custom."[101]

It was not always the case that the inelastic metal supply and consecutive depreciation of the coinage led to inflation. In fact, the causes of devaluation in the Middle Ages, particularly in Byzantium, were not always conducive to consequences of this nature. However, this was very much the case when an increase in both public expenditure and the budget deficit was involved and when the state, by creating a coinage with a reduced fineness, made a profit (*seigniorage* in the wider sense of the term, such as employed by economists). This was also the case when certain social groups brought pressure to bear in favor of a "profit inflation" (consisting of devaluing the coinage in which they paid their debts, while their creditors remained liable in strong coin), or again, when there was an imbalance in the balance of payments or in the monetary gold:silver ratio. It was not the case when the demand for coinage increased over the long or medium term, itself induced by an increase in the population and/or a rise in the economy's overall level of monetization.[102] These variations in the demand for coinage are examined below.

The Demand for and Circulation of Money

Monetization in the Byzantine World

The debate about the Byzantine monetary economy and the contrast between *Geldwirtschaft* and *Naturwirtschaft* in Byzantium goes back to the 1950s when historians began wondering why practically no coins from between the end of the seventh and the beginning of the ninth century have been found in the course of archaeological excavations on large urban sites. I will return to this large gap in numismatic data below.

Unlike A. Kazhdan and P. Charanis,[103] with their pessimistic assessment of this ab-

[100] *Nicephori Gregorae Byzantina historia,* ed. L. Schopen and I. Bekker, 3 vols. (Bonn, 1829–55), 3:52 (25.27): εὗρον ἐκπεπτωκὸς τὸ ἐν χερσὶν ἐκεῖνό μοι χάραγμα, καὶ ἐς τοσαύτην κατενεχθὲν ἡμέρᾳ μιᾷ τὴν ὕφεσιν ὡς τὴν τῶν δέκα μοι νομισμάτων ἐκείνων ποσότητα καταβῆναι μέχρις ὀκτώ.

[101] *Ioannis Malalae Chronographia,* ed. L. Dindorf (Bonn, 1831), 486: Μηνὶ μαρτίῳ ἰνδικτιῶνος α′ ἐγένετο διαστροφὴ τοῦ κέρματος: καὶ ἐκ τῶν πτωχῶν στάσεως γενομένης καὶ θορύβου ἀνηνέχθη τῷ αὐτῷ βασιλεῖ: καὶ ἐκέλευσε τὴν κατάστασιν τοῦ κέρματος κρατῆσαι κατὰ τὸ ἀρχαῖον ἔθος.

[102] C. Cipolla, "Currency Depreciation in Medieval Europe," *EcHistR* 215 (1963): 413–22.

[103] P. Charanis, "The Significance of Coins as Evidence for the History of Athens and Corinth in the Eighth and Ninth Century," *Historia* 4 (1955): 163–72 and A. Kazhdan, "Vizantiiskie goroda v VII–XI vv.," *Sovetskaia Arkheologiia* 21 (1954): 165–73.

sence of bronze coin finds, G. Ostrogorsky defended the contrary concept of a "developed state of the Byzantine monetary economy" in this period[104] by referring to the persistent issue of gold coins. However, the controversy was more about estimating the level of activity in urban circles on the basis of numismatic material than about monetization itself, a concept that has only recently aroused interest.[105]

Using a comparative approach, I have proposed combining relatively constant orders of magnitude, as recorded in the best known preindustrial contexts, with a few Byzantine figures deduced from papyri texts or other sources, in order to come up with a viable hypothesis for the sixth and the beginning of the seventh century, on the one hand, and for the twelfth to fourteenth centuries on the other. Subsequently, N. Oikonomides has tried to solve the problem of knowing "to what degree was the middle Byzantine economy monetized?" by analyzing and commenting on forty examples of monetary exchange (payments, wages, gifts or acts of charity, loans, etc.) drawn from saints' lives of the eighth to eleventh centuries. His answer can be given briefly as "to a high degree" (σε υψηλό βαθμό).[106] Inversely, H. Saradi has gathered about twenty archival documents from the thirteenth to fourteenth centuries that deal with transactions settled partly or wholly in kind, at the request, supposedly, of the benefiting peasants rather than of sellers or landowners/employers.[107] Neither of these studies, however, includes a list of all the recorded transactions that would allow the proportion of barter to monetized exchanges to be determined.

In quantitative terms, it is obvious that the level of monetization in the capital and provincial cities on the main sea or land routes was very different from the levels in the more remote urban sites and countryside. This is a constant feature of preindustrial economies, as emphasized repeatedly by contemporary authors (such as Cantillon in the 18th century) and by present-day historians. J. Durliat and M. Hendy have independently assembled examples from texts illustrating this contrast in Byzantium, and

[104] For the general context of this controversy, see Dagron, "Urban Economy," 388, and Laiou, "Economic and Noneconomic Exchange," 681ff. G. Ostrogorsky, "Byzantine Cities in the Early Middle Ages," *DOP* 13 (1959): 64. For a summary of different points of view, see D. M. Metcalf, "How Extensive Was the Use of Folles during the Years 775–820?" *Byzantion* 37 (1967): 270–310; A. Kazhdan, "Moneta e società," in Guillou et al., *Moneta* (as above, note 92), 205–22. S. Vryonis, "An Attic Hoard of Byzantine Gold Coins (668–741) from the Thomas Whittemore Collection, and the Numismatic Evidence for the Urban History of Byzantium," *ZRVI* 8.1 (1964): 291–300, acknowledges "the inconclusive and unsatisfactory nature of the numismatic evidence," while assembling all the documentary evidence that points to the vitality of a monetary economy based on gold.

[105] Hendy (*Studies,* 289–304) simply mentions (290–91) "the exceptionally low level of liquidity in the 4th c. diocese of Africa" and stresses the lack of liquidity in the provinces.

[106] Morrisson, "Monnaie et finances dans l'Empire byzantin Xe–XIVe siècle," 294–95; N. Oikonomides, "Σε ποιό βαθμό ήταν εκχρηματισμένη η μεσοβυζαντινή οικονομία," Ροδωνιά: Τιμή στον Μ. Ι. Μανουσάκα (Rethymnon, 1994), 2:363–70. Hendy rejects *a priori* such an approach. Without entirely dismissing hagiographical writings, he excludes any independent use of them on account of their unreliability: "The availability and utilization of coin was subject to such wide extremes of variation . . . as to render any generalisation derived from . . . the totting up of particular hagiographical cases to be virtually meaningless" (*Studies,* 14–15).

[107] H. Saradi, "Evidence of Barter Economy in the Documents of Private Transactions," *BZ* 88 (1995): 405–18.

M. Metcalf has analyzed evidence from Balkan excavations.[108] Such differences and variations over time and space should, in any case, not serve as a pretext for giving up all attempts at considerations of a more general nature. Of course, as K. Hopkins recalls in his study of tax and commercial exchanges in the Roman Empire, figures should be used with the utmost caution and our method should aim only at establishing a "matrix of possibilities."[109] Though the matrix proposed in this book (see A. E. Laiou, "The Byzantine Economy: An Overview," 1146–47) offers only hypotheses, these are interdependent, and any variation in one of these parameters automatically modifies the others.

The level of monetization of a given economy is defined as the commercialized percentage of the GDP, or gross domestic product (Y_m/Y), not to be confused with the level of liquidity, understood as the ratio M/Y (Y being the total GDP, whether monetized or not), with M being understood here as M1 in the sense of metallic money alone, Byzantium having known neither paper money, nor M2, meaning quasi-coins of various duration, in the absence of true fixed-term deposits of significant size. Although forms of bank accounts certainly had existed in Byzantium at various periods, they were very probably deposits on a current account and may be included within the classic conception of M1 defined by liquidity. There is not much difference between levels of monetization and of liquidity, when the velocity of circulation (monetary flow/stock or transactions/M1) is reduced to an annual periodicity, which was certainly the case in certain sectors of the Byzantine economy. In fact, if one allows as we do $Y_m/Y \leq 20\%$ of GDP), and assuming an annual periodicity for transactions, one could well obtain $M/GDP \leq 0.5$. On the other hand, it is more probable that this annual periodicity was valid only for the monetized part of the agricultural GDP (Y_m agr $\geq 26\%$ of the GDP) and that the velocity of circulation was four times higher for the monetized part of the non-agricultural GDP (Y_m non-agr $\geq 20\%$ of GDP), so the overall average periodicity of monetary transactions was on the order of 1.5[110] and the liquidity level was only two-thirds of the monetization level ($M/Y = 0.67\ Y_m/Y$ or 0.31).

The viscosity of monetary circulation in rural zones was obviously connected to the seasonal cycle of payments linked to grain and grape harvests, as well as to the concentration of monetary transactions and tax payments in September. This is demonstrated by the *typikon* of Pakourianos for the Bachkovo monastery, which prescribes that the *rogai* will not be paid each year in September "the moment when all the returns are made," but, "in order to avoid the brothers having to travel far to make their purchases, the *roga* will be paid on Easter Sunday, since that is the date set for the fair held at the gates of the monastery, at which everyone can easily find what they need." Thus the monastery's cash reserves remained blocked for six months of the year. It was this

[108] Hendy, *Studies,* 284–304, esp. 299–304; J. Durliat, "L'état byzantin et l'économie monétaire," in Hahn, *Moneta* (as above, note 10), 193–94 and 197–98; Metcalf, *South-Eastern Europe* (as above, note 68).

[109] K. Hopkins, "Taxes and Trade in the Roman Empire (200 B.C.–A.D. 400)," *JRS* 70 (1980): 101–25.

[110] $26.25 \times 1 + 20 \times 0.25 = 31.25$. Assuming a total monetary GDP of 46.25, the resulting velocity of circulation would be 1.48 (46.25/31.25). On this and what follows, see A. E. Laiou, "The Byzantine Economy: An Overview," *EHB* 1153–55.

seasonal pattern that constituted the contrast between the countryside and the urban zones with their hinterlands, where exchanges of a less fluctuating nature persisted throughout the year.[111]

The American economist R. W. Goldsmith has proposed an estimate for the level of monetization during the early Roman Empire. He assigns it a maximum of 50% ("it is unlikely to have been as high as one-half"), relying notably on his own estimates for India at the beginning of the twentieth century.[112] Other estimates relating to the proportion of revenues destined to autoconsumption in the underdeveloped economies of the twentieth century offer clues that point the same way: from 65% to 60% in the less advanced economies of the Sahel, 50% in the Ivory Coast, and 35% in Senegal ca. 1960, a similar figure to that observed in France ca. 1750. The monetization level of 46% for the whole Byzantine economy at the height of its prosperity proposed here (p. 1154) is consistent with these figures. It certainly covers very diverse situations reflecting, for instance, the 8–40% variation in the percentage of monetary specie in the private fortunes mentioned above or the proportion of expenses in coin for an institution such as the Bachkovo monastery. The annual expenses in coin envisaged by Gregory Pakourianos (the monks *rogai,* i.e., 761 nomismata and distributions of 222 nomismata, i.e., 983 nomismata or 13⅔ pounds) are estimated at around 20 pounds by P. Lemerle to take account of the unquantifiable wages of the *misthioi,* lighting, the upkeep of buildings, and sundry expenses. Estimates for expenses in kind can be made using prices that we know: using quantities similar to those given for the annual rations envisaged by Attaleiates for his foundation (24 measures of wine, 24 measures of wheat, 3 modioi of dry legumes, 1 nomisma of oil), the food for fifty-one monks, guests, and six unspecified novices, plus food for the poor and travelers, the overall quantities for which are set in chapter 29 of the *typikon,* would have amounted to 79 pounds of gold minimum.[113] Expenses paid in coin and the value of expenses paid in kind were on the order of 1:4, with monetary payments representing 20% of total expenses of foundations whose revenues were mainly agricultural. This approximation does not entirely contradict the maximum value proposed (pp. 1154–55: ca. 35%—26.25/75) within the framework of my hypotheses.

The liquidity ratios noted above have led me to propose values that would have

[111] Ed. P. Gautier, "Le typikon du sébaste Grégoire Pakourianos," *REB* 42 (1984): 68; P. Lemerle, *Cinq études sur le XIe siècle byzantin* (Paris, 1977), 143; M. Hendy "The Gornoslav Hoard, the Emperor Frederick I, and the Monastery of Bachkovo," in *Studies in Numismatic Method Presented to Philip Grierson,* ed. C. N. L. Brooke et al. (Cambridge, 1983), 179–91. For an analysis of the seasonal nature of monetary circulation in rural zones, of the monetization of the countryside in the 13th century, and the contrast with the towns in the West, see Spufford, *Money,* 382–86.

[112] R. W. Goldsmith, "An Estimate of the Size and Structure of the National Product of the Early Roman Empire," *Review of Income and Wealth* 30.3 (1984): 263–88; C. Morrisson, "Monnaie et finances dans l'Empire byzantin," in *Hommes et richesses* (as above, note 77), 2:294–95.

[113] Lemerle, *Cinq études,* 190–91. Little is known about prices for dried legumes, but the data for Edessa cited in E. Patlagean, *Pauvreté économique et pauvreté sociale à Byzance* (Paris, 1977), 408, show a ratio to wheat ranging from 1:1 (lentils) to 1:1.1 (beans) and 1:3 (chickpeas). The average adopted here is 1:2. The same ratio of 1:1 applies to wheat and λαχανόσπερμος in Egypt in the 4th century (Bagnall, *Currency and Inflation,* 64–65).

varied in Byzantium between a maximum 30% in the most monetized regions, during the most monetized periods, and 15% during other periods. Taking into account the overall average velocity of circulation proposed above (1.5), these liquidity ratios correspond well to a monetization level of 45% comparable to that proposed by our matrix. As discussed below, despite the strong spatial and temporal variations in the diffusion of the coinage, money was ubiquitous in the economic life of Byzantium.

What part did public money play in this monetary circulation? The rate of global taxation put forward in this model (21.25%) corresponds to a monetary levy of 17.8%. Taking into account a maximum monetization level of 46.25% in the most prosperous period of Byzantium's economic history and the assumed velocity of circulation, the implication is that taxes represented 57% of all coins in circulation (17.8/31.2 = 0.57)[114] and 38% of the monetary supply when one estimates that a third at least of the latter was immobilized by hoarding.

Distribution and Hoarding of Byzantine Coins: Monetary Circulation in the Empire

Levels of Circulation and Money Use For a long time now, levels of coinage use have been described in terms of a hierarchy that reflects the scale of the revenues themselves, and even of society. Three levels have been distinguished by P. Spufford for Europe at the turn of the fourteenth century: the gold of the aristocracy, officials, and great merchants; the large silver coins for the highest wages; and the small silver coins, especially the black money (billon), for the minor expenses of everyday life and almsgiving. At that time, the difference in value between the first of these denominations and the last was on the order of 1 to 1,000, a constant that applies nowadays to a hundred-dollar bill and a dime and an order of magnitude that applied more or less to Byzantium during its most highly monetized periods.

The circulation of money in Byzantium followed a pattern similar in most respects to that of the medieval West.[115] Thus the distributions made by St. John the Almsgiver during the famine of 613 ranged from one pound (72 solidi) for bishops to 6 nomismata for priests and deacons, 2 nomismata for clerics and chanters, and finally, to the small copper coinage (ἀργύριον τι καὶ ἕτερον κέρμα) for the poor.[116] During another

[114] This seems very high. If, on the other hand, the tax rate of 23% on gross agricultural production represents only a theoretical *maximum,* and the real tax rate was lower, as I tend to think, and supposing a real tax rate on the order of 15%, then the implications of the model are as follows: public revenues derived from agriculture, 0.15 × 75 = 11.25; public revenues in coin derived from agriculture, 0.8 × 11.25 = 9.2; public revenues from other sources, in coin 0.20 × 20 = 4; total public revenues in coin = 13. This means that the total tax revenues in coin now represent no more than around 42% of the currency in circulation (13/31.2 = 41.7) and scarcely 28% of the money stocks (0.66 × 41.7 = 27.5).

[115] For the 6th–7th centuries, see Patlagean, *Pauvreté économique,* 342–409. For the West ca. 1400 and its three levels of coin and credit, see Spufford, *Money,* 319–38; and the famous study by J. Meuvret, "Circulation monétaire et utilisation économique de la monnaie dans la France du XVIe et du XVIIe siècle," in *Etudes d'histoire économique,* Cahiers des Annales 32 (Paris, 1971), 127–37.

[116] E. Lappa-Zizicas, "Un épitomè de la Vie de S. Jean l'Aumônier," *AB* 88.3–4 (1970): 265–78. In

period of high monetization, the twelfth century, Ptochoprodromos compares the *hegoumenos,* with his assets worth 10 pounds in gold, counting his hyperpyra and the poor monk counting his beans, unable to buy himself some caviar, if only for a tetarteron, or to give a "follis" (meaning a stamenon?) in alms.[117]

Gold was indeed the principal instrument for ordinary and extraordinary imperial payments (*rogai,* tributes or foreign gifts, payments for the palace or for the various grades of provincial administrators), all of which helped put it into circulation.[118] However, the result was to distribute gold among the lower ranks of society, not only soldiers but also artisans, peasants, hermits and holy persons, prostitutes, and so on,[119] even though low sums were involved, a few pieces or divisional coins, and only on very rare occasions.[120] In the absence of these divisions of the gold coinage, which disappeared, as we have seen, during the eighth century, the other coins of precious metal (silver, then "electrum," that artificial alloy of gold and silver) or billon, furnished the necessary change and circulated more commonly than the nomisma. Evidence for this is provided by the miliaresia that were taken along during expeditions to enable the emperor to tip the guards of the Scholae, pages, members of the *hetaireia,* and others[121] and by the use of such pieces to buy a fine fish in the market at Constantinople.[122] Further evidence is provided by their occasional presence among archaeological finds. Naturally, copper coins are best represented among such accumulations of lost coins, and these are the least hoarded of all.

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the 4th century, *argyrion* designated (*PRyl* IV, 607, and *POxy* XXIV, 2729) a bronze coin that was originally silverplated (*nummus*). The term was applied next to the nummus and eventually came to mean, generically, early Byzantine small change made of copper: C. Morrisson, "L'économie monétaire byzantine," *RN* 29 (1987): 248 n. 3.

[117] See the satire against the *hegoumenoi* in *Ptochoprodromos: Einführung, kritische Ausgabe, deutsche Übersetzung, Glossar,* ed. H. Eideneier (Cologne, 1991), 4.5.85–96: Αὐτὸς ψηφίζει ὑπέρπυρα καὶ γράφει καὶ στρογγύλα, σὺ δὲ ψηφίζεις φάβατα . . . κ᾽ ἐσὺ ποτὲ οὐκ ἠγόρασες κὰν ταρτεροῦ χαβιάριν . . . αὐτὸς κὰν δέκα κὲκτηται λίτρας χρυσὰς λογάριν . . . σὺ δ᾽ οὐδὲ φόλλιν κέκτησαι, νὰ δώσῃς στὴν ψυχήν σου.

[118] M. Hendy, "Economy and State in Late Rome and Early Byzantium: An Introduction," in *Economy* (as above, note 7), art. 1; idem, *Studies,* 173–223; G. Dagron and C. Morrisson, "Le *kentènarion* dans les sources byzantines," *RN,* 6th ser., 17 (1975): 145–62; J.-P. Callu, "Le 'centenarium' et l'enrichissement monétaire au Bas-Empire," *Ktéma* 3 (1978): 301–16. Nikephoros III had given *sekreta* worth several talants (*polytalanta*) to Eudokia Makrembolitissa, and, according to Yahya of Antioch, a monastery with an income of "3 qintars of dinars" (21,600 nomismata) had been given to Romanos III's first wife.

[119] Patlagean, *Pauvreté économique,* 350. See also C. Morrisson and J.-C. Cheynet, "Prices and Wages in the Byzantine World," *EHB* 859–69.

[120] W. T. Treadgold, *The Byzantine Revival, 780–842* (Stanford, Calif., 1988), 36–38, concludes, "practically every adult Byzantine used coined money occasionally, if only to pay his taxes. . . . Since soldiers were settled all over the empire, even in the outlying areas, paying them in cash put money in wider circulation."

[121] *De cerimoniis aulae byzantinae,* ed. J. J. Reiske, 2 vols. (Bonn, 1829–30), 1:471, 473. On the distinction between (gold) kentenaria and miliaresia in this text and others, see Dagron and Morrisson, "Kentènarion," 152–53.

[122] I. Hausherr, *Vie de Syméon le nouveau théologien,* cited by Oikonomides, "Βαθμό," 368. Common fish, such as mackerel, cost far less and were sold 11 to the "follis" (tetarteron): see Morrisson and Cheynet, "Prices," 842.

However, it would be wrong to imagine that these three levels were kept neatly superimposed and separate: both the system for tax collection and private exchanges made it necessary to pass from one to another. Through the mechanism of the *charagma,* evidence for which is found in the *Palaia Logarike* at the end of the eleventh century, the state required tax to be paid in the superior nomisma once it amounted to more than 8 miliaresia (i.e., 1 nomisma for ⅔ nomisma, 2 nomismata for 1⅔ nomismata, etc.), with the taxpayer receiving the change (*antistrophe*) in low-value currency. In this form, the process seems to go back to the eighth century,[123] though a similar principle was certainly applied to taxes paid in coin during the early Byzantine period. The system played an essential role in promoting the circulation of money and the recycling of coins during the entire period studied here. Although we have no specific information, the implication is that there were fixed limits to the sums that could be discharged using inferior denominations.

Because he had to pay his tax in gold, the taxpayer, having set aside some silver or copper coins, then had to resort to the services of the money changers, just as the shopkeepers, officials, and landowners who owned gold coins did, in order to obtain small change for their minor expenses. Two definitions are topical. The *Glossai nomikai* explain the originally Latin term κολλεκτάριος as ὁ ἀργυρομοιβὸς ἤτοι ὁ κέρμα ἀντι ἀργύρου ἀλλασόμενος τραπεζίτης, ὁ ἀργυροπράτης, while the later definition by Theophylaktos of Ohrid, which consists mainly of explaining the obsolete terms *kollybistai* and *noummoi* rather than the profession, is well known: Κολλυβισταὶ δέ εἰσιν οἱ τὰ λεπτὰ νομίσματα πωλοῦντες ἤτοι τοὺς νούμμους: κόλλυβος γὰρ λέγεται τὸ λεπτὸν νόμισμα παρ᾽ Ἕλλησιν, ὃ Ῥωμαῖοι νοῦμμον ὀνομάζουσιν (Those who sell small coins or *noummoi* are *kollybistai;* for the [ancient] Greeks give the name *kollybos* to the small coin that the Romans call a *noummos*).[124] It was indeed a case of moving from everyday coins (νούμμος or κέρμα) to the intermediary currency, silver according to the *Glossai,* and even to gold, always in accordance with an official scale.[125] In the long term, the constant features of the monetization process outlined here apply more to the initial and final periods (6th–7th, 11th–15th centuries) than to the beginning of the middle Byzantine period (8th–10th centuries) and must be refined, depending on time and place.

[123] Svoronos, *Cadastre;* Hendy, "Coinage," 60–61, and *Studies,* 285–87; Morrisson, "La Logarikè: Réforme monétaire et réforme fiscale sous Alexis Ier Comnène," in *Monnaie* (as above, note 20), art. 6, pp. 442–43; Oikonomides, "De l'impôt de distribution à l'impôt de quotité, à propos du premier cadastre byzantin," *ZRVI* 26 (1987): 10, and Oikonomides, "Role of the Byzantine State," 1030.

[124] PG 123:1197B, cited by P. Gautier, "L'édit d'Alexis Ier sur la réforme du clergé," *REB* 31 [1973]: 174.

[125] The *Logarike* alludes to this scale. See also edict 16 of Valentinian III (445), which fixed the purchase and sale price for the solidus at 7,200–7,000 nummi. Does a memory of such indexes, which would have been posted in inscriptions at the sites where such transactions occurred, feature in the passage of the *Parastaseis* concerning the Strategion, where the "composition of the gold and silver was represented on marble inscriptions"? Ἐν δὲ τῷ μικρῷ Στρατηγίῳ μόλιβδος πολὺς χρηματίζει . . . ἀλλὰ καὶ χρυσίου καὶ ἀργυρίου διὰ μαρμαρίνων γραφῶν ποίησις: *Parastaseis Syntomoi chronikai,* ed. T. Preger (Munich, 1898), chap. 24.

The Sources and Their Interpretation There are two major sources for the study of monetary circulation in antiquity and the Middle Ages: documentary evidence, both textual and in the form of inscriptions, and the coins themselves. The former presents problems of interpretation (such as identifying the coins that are mentioned,[126] the distinction between real money and money of account, etc.); above all, it is very dispersed and not always well preserved. Nevertheless, the documentary evidence allows two major groups to be distinguished: on the one hand, the early Byzantine period, with a few inscriptions from the sixth century such as the edict of Anastasios, the tariffs of Adana and Cagliari, and the corpus of Egyptian papyri including, to a lesser extent, those of Ravenna; on the other, the late period (11th–15th centuries), which includes the acts of Athos, Patmos, and others, as well as the wealth of documentation in Italian archives.[127]

Archaeological evidence as provided by coin finds is more coherent, though it is affected by a degree of bias. There are two reasons for this: the various laws in modern states that serve to encourage or discourage the dissemination of information and have been, or are, implemented in very different ways, and the fortuitous distribution of finds. Numismatists classify these finds as, respectively, hoards (collections of coins that have been deposited intentionally, corresponding to the classical legal definition, "vetus quaedam depositione pecuniae cuius non extat memoria ut iam dominum non habeat,"[128] although here the essential element is the absence of a known owner); isolated finds (meaning coins found by chance in a variety of places); and archaeological finds (meaning all the coins discovered on a single site). These three categories sometimes overlap. Archaeologists can discover isolated finds and hoards on the same site, as was the case at Corinth and Athens; and chance finds that are concentrated in a specific place (such as a river crossing, a church,[129] or a place of pilgrimage) are intentional, not haphazard, deposits and are thus not related to hoards, which were intended to be recovered, nor to isolated losses on a particular site, archaeological or otherwise.

Hoards (emergency hoards only, not savings hoards) reveal the composition of the coinages in different metals at a given time and place, whereas site finds tend, rather, to provide evidence about fluctuations in the production and supply of the currency, unless a detailed study has been published setting the coins in their stratigraphical context and enabling them to be classified according to levels and periods of circulation. In fact, the average delay between the issue and loss of a coin is such that site

[126] There is no systematic catalogue of the names of coins in Byzantium, but see *DOC* 3:44–61, 4:55–58, and 5:19–32.

[127] See Morrisson and Cheynet, "Prices," passim.

[128] CIC, *Dig* 41.1.31.1.

[129] Not all church finds can be ascribed to voluntary deposits, such as offerings to the Confession of St. Peter in Rome. They were often the result of losses by the faithful and are thus related to site finds, such as at St. Polyeuktos (Saraçhane). Recently, this category of finds has aroused interest: cf. *Trouvailles monétaires d'églises,* ed. O. F. Dubuis and S. Frey-Kupper (Lausanne, 1995).

finds and isolated coins are indeed representative of the monetary circulation of the time, within the scale of a century, which justifies including them in statistical analyses.

This form of documentation, its interpretation, cartography, and methods of statistical evaluation were all developed extensively during the decades after World War II, in line with the publication of new research.[130] However, with the exception of D. M. Metcalf's work on the Balkans between 820 and 1396,[131] we have no synthesis of this abundant and very dispersed literature. Given the bulk of the documentation, the survey presented here is necessarily more than sketchy. For each of the three great periods under consideration, it attempts to compare the documentary evidence, where it exists, with that of the finds. I am well aware of its imperfections.

The Seventh Century: The "Dark Ages" and the "Break" in Continuity (602–820)

At the turn of the sixth and seventh centuries, money continued to circulate within a space that was integrated in part, but only in part. A hoard found in northern Syria and dated to the beginning of the 590s could still contain bronze coins of Maurice from the main eastern mints (Constantinople, Nikomedeia, Kyzikos, and Antioch) and from Thessalonike, but the African, Italian, and Dalmatian (Salona = Split) mints are represented only by older pieces, witnessing to the mixed coinage of Justinian's reign. Similar examples can be found in the western part of the Aegean: at Athens, in the Dipylon hoard, buried after 583, the coins of Tiberius and Maurice are still derived from Constantinople, Thessalonike, and Nikomedeia, but there, too, the examples from Antioch and Sicily go back to Justin II or Justinian; at Histria, a little hoard dated to ca. 601 contains issues of Justin II and Maurice from Constantinople, Nikomedeia, and Antioch; at Horgeşti, a further hoard covering the same reigns adds Thessalonike and Antioch to these mints. All of which serves to accentuate the trend toward a monetary circuit that functioned within two large regional groups in the East and the West (themselves possibly divided into more or less autonomous and even closed zones, e.g., Africa, Italy, Egypt) and that was already perceptible in the second half of the reign of Justinian. Was this trend due to the reduced mobility of troops, as compared with the period of the reconquest, or to decreasing interregional exchanges?

These phenomena must have had a joint effect because pottery experts have observed that exchanges between the two parts of the Mediterranean began to decrease, starting in the 550s, and that there was a tendency toward autoconsumption, meaning mainly local provisioning on sites such as Ostia and Carthage.[132] However, this did not involve a complete caesura as is demonstrated, notably, by the persistent penetration

[130] See P. Grierson, "The Interpretation of Coin Finds," (1), (2), *NC* (1965), (1966) (= *Later Medieval Numismatics* [London, 1979], arts. 21 and 22); *Coins and the Archaeologist,* ed. J. Casey and R. Reece, (Oxford, 1974), passim—notably the article by J. P. C. Kent, "Interpreting Coin Finds," 184–200—and J. Casey, *Understanding Ancient Coins* (London, 1986), 67.

[131] *Coinage in South-eastern Europe* (London, 1979).

[132] S. Tortorella, "La ceramica fine da mensa africana dal IV al VII sec.," in *Società romana e impero tardoantico,* ed. A. Giardina (Rome, 1986), 3:211–25; C. Panella, "Gli scambi nel Mediterraneo occidentale," in *Hommes et richesses* (as above, note 78), 1:138–41.

of Byzantine coins into Gaul, parallel to the arrival of African and Oriental pottery there and in Italy, albeit at a modest rate. The overall picture must be adjusted and regional exceptions stressed, such as that of eastern Sicily and its sphere of influence, to which I shall return.

The increasing fragmentation of the Byzantine-Mediterranean complex preceded the seventh century and the Arab conquest. However, the main phenomenon relates to the collapse of the overall level of monetary finds in sites, wherever they are located. This general collapse is summed up spectacularly by the histograms that D. M. Metcalf drew up for the first time in 1960, here corrected or completed by reference to other sites[133] (Fig. 6). These histograms were established by summing up the number of bronze coins discovered and arranged in phases, and then by dividing this number by the number of years for each of them, thus producing an annual frequency index. The comparison of sites where the absolute number of pieces found can be very different should, as a general rule, affect this index by a coefficient that takes account of this variable (the total number of coin finds/1,000). On the other hand, the statistics have not been able to take account of the very variable purchasing power of low-value currencies, suggesting that the annual frequency index could somehow be "deflated" by converting the total number of examples into their "bronze value" (each example being given its value in nummi: one follis = 40, a half-follis = 20, etc.) or into the "gold value" (by converting the "bronze value" into solidi according to estimates for the gold:silver ratio during the period under consideration). A conversion of this kind was attempted for the finds from the American excavation at Carthage, and the experience demonstrated that the annual index in bronze value indicates the periods of inflation (the end of the 6th and the mid-7th centuries), but the variations in the gold index run along the same lines as those in the base nondeflated index. The similar conversion practiced on the monetary finds in Dobrudja is more precise insofar as it adopts a chronological breakdown that follows the mutations of the bronze currencies; it enables the importance of the peak observed under Justin II to be relativized but not cancelled.[134] Thus we can justify retaining this nondeflated index on a provisional basis, concentrating only on its relative evolution.

Everywhere, in the eastern part of the empire, in Asia Minor and in the Balkans, the last issues that are attested in still significant quantities are those of Constans II; a modest revival did not occur before the first half of the ninth century. We are well within the 668–874 limits, very precisely with regard to the drop and a bit beforehand for the recovery, that D. Zakythinos fixed in 1966, on the basis of archaeological finds,

[133] D. M. Metcalf, "The Currency of Byzantine Coins in Syrmia and Slavonia," *HBN* 4 (1960): 429–44, corrected for Antioch by adding finds from the Arab period (Fig. 6.15) and supplemented by those of Aphrodisias, Ephesos, Pergamon, Priene, Constantinople, Tŭrnovo, Preslav, and Pernik, including those from sites in Albania, Calabria, Apulia, and Sicily.

[134] C. Morrisson, "Coin Finds in Vandal and Byzantine Carthage: A Provisional Assessment," in *The Circus and a Byzantine Cemetery at Carthage,* ed. J. H. Humphrey (Ann Arbor, 1988), 1:423–35. G. Poenaru-Bordea, "Problèmes historiques de la Dobroudja (VIe–VIIe siècles) . . . ," in Guey and Hackens, *Statistique et numismatique* (as above, note 73), 365–77.

for the large gap ("la grande brèche") of the seventh to ninth centuries. The evidence of site finds is indisputable; since isolated lost coins are involved, the lacunae cannot be explained, as has sometimes been attempted, by Theophilos' monetary reform, which would have withdrawn the earlier bronze coins, or by a *damnatio memoriae* of iconoclastic coins. Similarly, on the sites, the relatively important number of seventh-century bronze coins is not directly linked to the insecurity of the age, as it is in the case of hoards. Of course, the material gathered never does relate to the whole of a site, and we do not always have continuous data for the merchants' zone that is most likely to provide coins.[135] Nevertheless it may be supposed that, though a more exhaustive collection would improve this general picture in important ways, it would not fundamentally alter it.

A few examples will sum up the well-known and frequently commented on monetary gap that reveals the process of decline and impoverishment whereby "towns" were reduced to the role of places of refuge: at Ankyra, nothing between Constans II and a single follis of Leo IV; at Aphrodisias (Fig. 6.1), no coins between Constans II and Theophilos; at Pergamon, none between 715 and 820 (Fig. 6.2); at Kenchreai, nothing between Constans II and Leo VI; and in the Albanian finds (Fig. 6.3), no bronze pieces between 668 and 802.[136] The rapid and accentuated decline in monetary circulation was accompanied by a retraction in the range of its diffusion, a geographical retraction that shrank faster than the empire's frontiers. Thus the relative ubiquity of the coinage until the end of the sixth or the beginning of the seventh century in the Balkans, and until the mid-seventh century in Asia Minor—though several finds from the reign of Constans II at Sardis (Fig. 6.4) and Athens (Fig. 6.5), for instance, must be related to military expenditure and the cantonment of troops[137]—contrasts with the very small number of places that have disclosed coins issued between 668 and 820.

The situation appears to have been less serious in Constantinople, going by the unfortunately very limited evidence provided by excavations in the Hippodrome, which have not been adequately published, and those at Saraçhane. At St. Polyeuktos (Fig. 6.6), in fact, Hendy stresses both the absence of any diminution of or interruption in the monetary series, so strong a feature of provincial sites, and the "extraordinary representation" of issues of the eighth and ninth centuries. This numismatic contrast between the capital and the provinces is only to be expected; Metcalf had drawn attention to it as early as 1967. It corresponds with the impression provided by the texts, which has often been stressed, as much, for instance, by W. Brandes with regard to Constantine V and the period as a whole, as by Oikonomides, who contrasts the gifts

[135] See comments by Foss, *Ephesus,* and "Sardis", or D. M. Metcalf ("How Extensive Was the Issue of Folles during the Years 775–820?" *Byzantion* 37 [1967]: 277 and 304) regarding Corinth, where the excavated area includes the 9th–10th-century *plateia,* though not the slopes of the Acrocorinth, where the 8th-century merchant area was probably located, and Athens, where the location of the urban center in the 8th–9th centuries is not known.

[136] C. Foss, "The Persians in Asia Minor and the End of Antiquity," *EHR* 90 (1975): 721–47; W. Brandes, *Städte,* 146–49; Dagron, "Urban Economy," 393–96.

[137] C. Morrisson, "Byzance au VIIe siècle: Le témoignage de la numismatique," in *Byzance: Hommage à André Stratos,* ed. N. Stratos (Athens, 1986), 1:149–63; Hendy, *Studies,* 641, with references.

or loans in kind made by Philaretos in Paphlagonia with the almsgiving in coin that was practiced in Constantinople during the same period.[138]

However, on a few sites in better-favored localities, one can observe clues pointing to the persistence of exchanges, though certainly on a very reduced scale: in the German excavations at Magnesia on the Meander, there are no bronze coins of between 668 and 969 and just one miliaresion of Constantine V; at Priene (Fig. 6.7), halfway through an equally long lacuna, one miliaresion of Leo III and a follis of Leo V; at Ephesos (Fig. 6.8), nothing between Constans II and Leo VI, except one miliaresion of Constantine V found near the temple of Domitian;[139] at Sardis, only 11 coins for the period 668–886 (2 bronze coins of Constantine IV, 2 of Leo IV, 1 of Leo V, 2 of Michael II, 2 of Theophilos, 2 of Basil I), and a tremissis of Justinian II (Fig. 6.4). Similar markers have been found at the agora in Athens, where, between 668 and 820 (Fig. 6.5), all the reigns are represented except those of Nikephoros I and Michael I, and at Corinth, where a few examples from most of the reigns are listed, between the 96 bronze coins of Constans II and the 161 coins of Theophilos (Fig. 6.9). The presence of miliaresia among these haphazard losses has not been sufficiently stressed: nevertheless, it marks the relatively important role played by the new coin. At Athens, of 138 bronze coins dated to 668–820—only 54 if one excludes the 61 coins of Philippikos and the 23 coins of Leo III, which are considered correctly by Charanis to constitute a special case—one notes the presence of 8 folles of Syracuse (5 of Constantine IV, 1 of Justinian II, 1 of Leo III, 1 of Constantine V), evidence of the persistence of the port's links with Sicily and of the former's traditional role as a stopping-off point along the route that connected the island with the capital.

The situation in Sicily and Byzantine Italy has remained curiously outside the debate on the demonetization of Byzantium during the Dark Ages. This was not surprising in the 1960s, when the documentation was still very little known. Nowadays, Italian archaeologists and historians have succeeded in making great progress in this direction. The general picture, while still imperfect, is nonetheless clear: in eastern Sicily, notably, the evolution of the index, calculated on the basis of nearly a thousand coins—mostly bronze—derived from finds and local collections, is not dissimilar to that in the capital (Fig. 6.10). Certainly, the period between 668 and 811 was, here too, a time of retreat, but the contraction was far from total, and the intensity of the circulation is nearly comparable to that in the Justinianic period.[140] The growing regionalization of

[138] Metcalf, "Folles," esp. 304–5; Saraçhane: M. F. Hendy, "The Coins," in *Excavations at Saraçhane in Istanbul,* ed. R. M. Harrison, vol. 1 (Princeton, N.J.–Washington, D.C., 1986), 278–373; Brandes, *Städte,* 147–49; Oikonomides "Βαθμὸ," 365.

[139] Foss (*Ephesus,* app. 6) stresses that coin finds, insofar as there have been any (as seems likely) in excavations undertaken in the periphery of the city, have not been recorded.

[140] For Italy, see the assessment—with a detailed bibliography and list of finds prior to 1992, based on numerous data, from both unpublished sources and scattered publications—compiled by E. A. Arslan, "La circolazione monetaria (secoli V–VIII)," in *La storia dell'alto medioevo italiano (VI–X secolo) alla luce dell'archeologia* (Siena, 1994), 497–519, and, also under his direction, "Italia medievale," in *A Survey of Numismatic Research, 1990–1995* (Berlin, 1997), 447–68. For Sicily, G. Guzzetta, "Appunti di circolazione monetaria nella Sicilia Orientale bizantina," in *La Sicilia rupestre nel contesto delle civiltà*

the circulation of bronze coins, observed above, is very clear: on the other hand, in spite of the abundant local production of gold coins, preserved hoards, such as those of Milazzo or Capo Schisò (Naxos), buried ca. 683 and 797, are uniquely composed of nomismata of Constantinople. The latter may reflect a preference for coins of better fineness over the debased coins of Syracuse, as well as the island's still active commercial relations with the East.

In the theme of Calabria, though undoubtedly to a lesser degree than in Sicily—the sample is smaller by about half in terms of absolute value—one can observe a greater resilience of the monetary circulation in the years 668–881 than was the case to the east of the empire: the total absence of finds is limited to the years 775–802. The Sicilian mint supplied gold and bronze coins whose circulation was limited at first to Reggio and its immediate hinterland. However, the revival is observed already under Leo V (813–820) and affects a larger zone.[141] The index (Fig. 6.14) evolves in part conversely to the one for Sicily, showing a very modest rise in the seventh century and a much more marked one in the ninth; it illustrates the way the southern part of the peninsula, especially Calabria, acted as a zone of refuge from the Arab advance into Sicily. In Rome, in the Crypta Balbi excavations, a few solidi, silver coins, and numerous bronze coins of 30 nummi were found in a well-stratified seventh-century context. Nearly all the copper coins were of different dies, and the presence of a few little Byzantino-papal silver issues as well as the existence of tesserae in the names of Popes Gregory III and Zacharias points to a persistent demand for low-value currency in the city.[142] At Ravenna, prior to the Lombard conquest, the excavations at Classe and the collections in the museum bear witness to a retraction of the low-value currency and of links with the East, while also pointing to the maintenance and even the development of relations with Rome and Sicily.[143]

Recovery and Expansion (ca. 820–1204) The frequency with which isolated or site finds occur increases perceptibly from the first half of the ninth century; over and above their regional variations (Fig. 6), the coherent nature of these evolutions has definitely

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mediterranee: Atti del sesto Convegno internazionale di studio sulla civiltà rupestre medioevale nel Mezzogiornia d'Italia Catania, Pantalica, Ispica, 7–12 settembre 1981), ed. C. D. Fonseca, (Galatina, 1986), 121–33; D. Castrizio, "Circolazione monetaria bizantina nella Sicilia Orientale," *Sicilia Archeologica* 24.76–77 (1991): 67–75; G. Manganaro, "La collezione numismatica della Zelantea di Acireale," *Memorie e Rendiconti dell'Accademia di Scienze, Lettere e Belle Arti degli Zelanti e dei Dafnici di Acireale* 10 (1970): 273–318.

[141] G. Guzzetta, "Per la Calabria bizantina: Primo censimento dei dati numismatici," in *Calabria bizantina: Istituzioni civile e topografia storica* (Reggio Calabria, 1986), 251–80. The data collected therein are the source for Fig. 6 (coin hoards have been excluded).

[142] A. Rovelli, "La *Crypta Balbi:* I reperti numismatici," in *La moneta nei contesti archeologici,* Atti dell'incontro di studio, Roma (1986), Istituto Italiano di numismatica, Studi e Materiali 2 (Rome 1989), 49–95; eadem, "La circolazione monetaria a Roma nei secoli VII e VIII: Nuovi dati per la storia economica di Roma nell'alto medioevo," in *Roma medievale: Aggiornamenti,* ed. P. Delogu (Florence, 1998), 79–91.

[143] E. Ercolani-Cocchi, *Imperi romano e bizantino: Regni barbarici in Italia attraverso le monete del Museo Nazionale di Ravenna* (Ravenna, 1982); eadem, "La circolazione monetale fra tardoantico e alto medioevo dagli scavi di Villa Clelia," *Studi Romagnoli* 29 (1978): 367–99.

been revealed, allaying the doubts that have been voiced, for some time now, about the new takeoff of money production and demand for money that began at that time. The main origin of this phenomenon is to be sought, as M. Metcalf and M. Hendy have both stressed, in an imperial initiative and probably in the modification of fiscal practices such as the revival or the development of the *antistrophe*.[144] The measures in question were not neutral and must have had a chain effect on the economy as a whole. They could promote the growth of products destined for commercialization, while military expenses, which "produced" increased security in the mid- or long-term, also created conditions favorable to a relative development of the agricultural economy in general, followed by that of exchanges and of the monetary economy in particular. The fact that Muslim bronze coins have been found in Corinth, albeit in low numbers, also points to the role of long-distance trade in this growth.[145]

In the Balkans, according to the evidence of the numismatic documentation that Metcalf has analyzed in detail, the recovery came in two stages. During the first period (ca. 820–969), the growth rate was certainly significant but remained moderate, with the average annual index rising from 10 to 41 at Corinth and from 0 to about 7 at Athens (a rise of respectively 1% and 4% per year; Fig. 6), and the diffusion of coins continued to be concentrated in the coastal zones. During the second period, which started in the second half or at the end of the tenth century—969 is a convenient date, chosen because it marks the beginning of the issue of anonymous folles—the increase was more marked; at Corinth the index rose from 41 to 54 for the period from 969 to 1034, then to 91 for 1034–81 and even, though with a different denominational structure, to 126 for 1081–1143 and to 138 for 1143–1204, the respective figures at Athens being 7, then 13, then 56, with a decline to 33 between 1081 and 1143 and a marked recovery to 102 until 1204. This period also shows a more extensive diffusion of coins, since the number of sites outside central Greece to have produced monetary finds for the years 969–1056 is twice or three times that for the years 913–969, according to Metcalf's findings.[146]

In spite of this, we do not have a flawless general picture of the use of money. There are shadowy zones, which serve to confirm clues in the documents about the weak monetization of some regions, notably Kedrenos' text on the taxation in kind that Basil II retained for the Bulgarians after his reconquest, possibly in accordance with the Slavs' ancient cultural traditions, which have been frequently emphasized.

The monetization of the Balkans, with the exception of central Greece, the lower Danube region, and the princely residences and important strongholds of Bulgaria (Fig. 6.11–13), progressed only slowly in the course of the eleventh century and was further impeded in the 1030s and 1080s by troubles and incursions, which explains

[144] Metcalf, *South-eastern Europe,* 18; M. Hendy, "East and West: Divergent Models of Coinage and Its Use," in *Il Secolo di Ferro: Mito e realtà del secolo X (Spoleto, 19–25 aprile 1990)* (Spoleto, 1991), 637–79; Laiou, "Exchange and Trade," 733–34.

[145] G. C. Miles, "The Circulation of Islamic Coinage of the 8th–12th Centuries in Greece," *Congresso Internazionale di Numismatica Roma, 1961,* II, *Atti* (Rome, 1965), 458–98.

[146] Metcalf, *South-eastern Europe*.

why the anonymous A- and B-class folles before 1034 are the best represented. Its real development came in the twelfth century, when the economic crisis and the military reversals of the 1070s–1090s, the cause of many emergency burials of precious metals, had been surmounted.

The details of monetary development in Asia Minor are much less well known. Since the publication of local collections (Fethiye, Afyon, Sinope, Silifke, Antakya) planned by a few teams of researchers is still being awaited, there is as yet little if any information about discoveries of isolated coin finds or hoards with established provenances. Thus most of our data are derived from about ten sites, mostly situated in the coastal zone and its immediate, most highly monetized hinterland, with the exception of Amorium.[147] The recovery in the coastal sites appears to have come later than in the Balkans, with the exception of Ephesos and Sardis. Although not as spectacular as at Athens, it is no less clear. By keeping to a period when the local currency consisted of a single denomination, the follis (even though the 11th-century drop in weight constituted a devaluation), the incidence of finds is multiplied by 3.6 at Ephesos between 969 and 1034, by 4.3 between 969 and 1081, at Pergamon by 5.8 or 10.4 for the same periods, and doubles at Sardis between 969 and 1081. The abundance of anonymous folles in the batches of Turkish origin on the European market in the 1960s has not been quantified, though it serves to confirm the phenomenon. For the twelfth century, the predominance in Asia Minor and in Thrace of finds of stamena can be observed, though no explanation is forthcoming, while in Greece tetartera and half-tetartera constitute the overwhelming majority.

As emphasized above, the recovery, regardless of its origins, occurred earlier in Italy than in the rest of the empire since it was felt in Calabria as early as 813. In Capitanata, to the north of the Ofanto River, it clearly coincided with Basil I's reconquest and was manifested with some force. Around Bari and in the south, the continuity was "more marked, albeit weaker," according to G. Guzzetta, who is not more specific.[148] The data gathered by L. Travaini for the whole of Apulia, starting only in 886 (Fig. 6.15), reveal a level comparable to that in Calabria, even higher with regard to the folles of the second half of the eleventh century, and due, in her opinion, to military operations or simply to the Byzantine presence, extended to 1071 instead of 1060. More than anything, I should emphasize the contrast between a Calabria that still looked toward Sicily, even after the Arab conquest, and an "Ionian" Apulia that was entirely turned toward Byzantium. In the latter, Constantinopolitan pieces of every kind of metal dominate, as is proven by the documents, together with finds and local collections. The absence of gold finds, apart from a single nomisma of Basil II in the Ordona hoard alongside 148 taris of Salerno, is not sufficient to refute all the evidence provided by archival documents about the use of gold coins, which were indeed real since pains were taken, in an age of devaluation, to specify their type using a whole set of epi-

[147] C. Lightfoot, "The Amorium Project: The 1997 Study Season," *DOP* 53 (1999): 338–40.

[148] G. Guzzetta, "Lineamenti di circolazione monetaria nella Puglia Settentrionale," in *La ricerca archeologica nel territorio garganico* (Foggia, 1984), 209–19.

thets.[149] In Calabria, on the other hand, while the Byzantine follis did indeed constitute the sole local small change, the gold mentioned in documents, notably in the *Brebion* of the metropolis published by A. Guillou,[150] is the Sicilian tari, the money of exchange with the island and, above all, the coin used in the silk trade. It is not surprising to find zones of circulation overlapping political boundaries; this phenomenon occurs frequently in frontier regions that served rather to unite than to divide.

The End of the Hegemony and the Penetration of Foreign Money (1204–1453) By the end of the twelfth century, especially from 1204 on, the political fragmentation of the Byzantine world brought about the creation of coinages that were either "national" (in Trebizond starting in 1222, in Bulgaria starting in 1218, and in Serbia in 1228), colonial, or feudal.[151] These coins brought about a corresponding reduction in the diffusion of the imperial coinage, which they often copied. This was the case with the imitation stamena and hyperpyra that were struck after 1204 in Constantinople and Thessalonike and have been identified by Hendy.[152] The fact that neither the Latins nor the Venetians introduced coins in their name or type shows how strong a hold the Byzantine model retained. After an eclipse at the beginning of the century, the hyperpyron recovered some vitality in the 1230s, as demonstrated by Romanian, Bulgarian, and Greek hoards. It continued to be fairly widespread until around 1330 and to be mentioned in textual sources as late as 1387, even 1402,[153] though it had not been struck since 1353. The Venetian gold ducat and its imitations took its place in the long-distance Aegean trade of the second half of the fourteenth and the fifteenth century; at Constantinople the gold Venetian coin (τὸ χρυσοῦν καὶ βενετικὸν νόμισμα) was then the reigning coin,[154] though not the commonest one.

In fact, other Venetian coins had already penetrated the monetary circulation in Byzantium, including the remaining territories under the empire's control. Between 1286 and 1374 the Athonite documents refer to hyperpyra that were paid in Venetian ducats (διὰ δουκάτων βεννετικῶν) or in "ounces of ducats,"[155] and hoards confirm the current use of silver grossi, from Thrace to the Peloponnese from the 1270s to the mid-fourteenth century.[156] The shrinkage of the imperial territory in the fourteenth

[149] J.-M. Martin, "Economia naturale ed economia monetaria nell'Italia meridionale longobarda e bizantina (secoli VI–XI)," in *Storia d'Italia, Annali 6: Economia naturale, economia monetaria,* ed. R. Ruggiero and U. Tucci (Turin, 1983), 181–219. L. Travaini, *La monetazione nell'Italia normanna* (Rome, 1995), 88–91, 362–94.

[150] A. Guillou, *Le brébion de la métropole byzantine de Région (vers 1050)* (Vatican City, 1974).

[151] P. Grierson, *Byzantine Coins* (London, 1982), 269–75; D. M. Metcalf, *Coinage of the Crusades and the Latin East* (London, 1995); *DOC* 4.1:135–37; *DOC* 5.1:37–38.

[152] Hendy, "Coinage," 191–223.

[153] M. Balard, "Monete bizantine e monete occidentali a Bisanzio dall' XIII al XV secolo," in *La cultura bizantina* (as above, note 93), 263–67.

[154] P. Canivet and N. Oikonomides, "Jean (Argyropoulos) 'La comédie de Katablattas': Invective byzantine du XVe siècle," Διπτυκά (1982–83): line 292.

[155] In T. Bertelè, *Moneta veneziana e moneta bizantina* (Florence, 1973), 58–61.

[156] M. Galane-Krikou, "Συμβολή στην κυκλοφορία βενετικών γρόσσι 13–14 Αι. στον Ελλαδικό Χώρο," Αρχαιολογικά Ανάλεκτα εξ Αθηνών 21 (1988) [1993]: 163–84.

century had a corresponding effect on the area where Byzantine coins were used. The stavraton and its fractions were apparently not used outside the capital and its hinterland, and they coexist in finds alongside growing proportions of foreign coins. One Balkan hoard (Bulgarian?, deposited ca. 1380), includes 40 coins of John V and Andronikos IV, 15 Bulgarian, and 3 Serb coins; the find at Belgratkapi (Istanbul, deposited ca. 1390) contains 2,280 quarter stavrata and 1,221 follari of John V, with some 500 Bulgarian, Venetian, Ottoman, and other coins; at Çorlu (deposited ca. 1443) there are 1,630 pieces of John VIII and 2,000 aqces. Books of accounts, such as Badoer's, and references in manuscripts also illustrate this monetary variety, indicative of both the way the markets opened up in the wake of the commercial revolution and of Byzantium's economic decline and inability to impose the exclusive tender of its currency in its territory, thus losing a great part of the profits due from seigniorage, which, in the West, could amount to 5% during the fourteenth century. It is understandable why this invasion, which was even worse in the Morea, where the despots struck no coins, caused Plethon to engage in the following bitter reflections: "Furthermore, one cannot fail to observe the urgent need to remedy the state of our coinage; for it is truly absurd to employ these foreign copper pieces which are also false coins, for which others reap the profit, whereas we, for our part, retain only the ridicule."[157]

Judging by the reduced number of finds on sites and the scarcity of hoards, it would seem that monetization diminished, even prior to the recession of the fourteenth century, never to recover the peaks of the twelfth century (see Figure 6.10). This "monetary impoverishment" applies not only to Byzantine finances but to the whole economy; by the beginning of the fifteenth century, both demand and exchanges seem to have been increasingly concentrated within the transit islands that Constantinople and Thessalonike had become. However, it was precisely because demand had declined that Byzantium does not appear at this date to have suffered from the bullion famine then affecting the West.

The Diffusion of Byzantine Money outside the Empire

The situation in these last two centuries stands in cruel contrast with the monopoly that Byzantine currency had enjoyed until the twelfth century, within its own frontiers and through its diffusion in the lands beyond—a measure of its political and economic influence. The traces of this diffusion are provided not only by monetary finds, set alongside references in textual sources, but also by the imitations of Byzantine monetary types, which point to the influence of imperial prototypes and to at least indirect knowledge of them. The documentation is biased because it has been so unevenly preserved in modern times, but also because certain medieval states probably melted down Byzantine coins in order to use the precious metals for minting their own coin-

[157] Ed. P. Lambros, Παλαιολόγεια καὶ Πελοποννησιακά (Athens, 1923), 3:262; cf. D. Zakythinos, *Le despotat grec de Morée,* 2 vols. (Athens, 1953), 2:266–67.

ages. These factors combine to explain the imbalance in favor of eastern and northern Europe, where finds are relatively more numerous than in the West. Nevertheless, it is not clear whether or not this superiority reflected a privileged orientation in their commercial relations. This is why isolated finds of bronze coins would serve as a better, or a less inadequate, tracer.

Despite the absence of a detailed synthesis of a very scattered numismatic documentation[158] and the risk of oversimplification, it is interesting to compare these sources with the actual state of our knowledge about the trade of the empire. Here, too, three periods can be distinguished: the seventh to eighth centuries until ca. 820, from 820 to ca. 1000, and the eleventh to twelfth centuries.

In the seventh to eighth centuries, noneconomic exchanges are reflected in the solidi found in China (rare witnesses to attempts at establishing diplomatic contacts) and in Avar territory, and partly in the solidi that reached the Ukraine, in southern Russia, Khazar territory, and the lands of the Caucasus. In the last case, the payment of solidi and hexagrams to the allies of Herakleios constituted a kind of economic exchange insofar as services, in this case of a military nature, were purchased. This also applies to the tribute that was paid to the Avars until the reign of Constantine IV, since it purchased security and replaced direct military expenditure (one wonders how efficiently).

If we restrict ourselves to direct "economic" exchanges, we should note two facts: the persistent penetration of Byzantine money into Umayyad Syria-Palestine until ʿAbd al-Malik's reform (693/4) and the continuance of relations with the West. In the latter case, the numismatic evidence is amply confirmed by finds of eastern amphoras and African *sigillata*. The gold of Constantinople was presumably melted down by Merovingian mints in the south of France and by the mint in London from the end of the sixth century, though it did leave a few traces in the regions along the Rhine until 620. However, the seventh-century bronze coins found in France, Switzerland, and Germany, west of the Rhine, point to the predominance of the African trade, compared to exchanges with Constantinople or Sicily. The role of the latter trade must be stressed, though, because gold of Syracuse was still reaching the West in the eighth century (a solidus of Leo III in Kent, of Constantine V near Schwerin, folles of Constantine V and Leo V in Austria, etc.).

For the middle period (early 9th century to the year 1000), we can note the traces left by Theophilos' diplomatic initiatives on the shores of the Baltic (a seal belonging to the *patrikios* Theodosios and a nomisma of Theophilos were found in the Haithabu excavations), and, above all, the evidence that Muslim and Byzantine gold pieces were used in conjunction, which could only have happened in the course of commercial exchanges: the Bologna hoard (terminus post quem [t.p.q.] 811) includes 5 nomismata

[158] C. Morrisson, "La diffusion de la monnaie de Constantinople," in *Constantinople and Its Hinterland,* ed. C. Mango and G. Dagron (Aldershot, 1995), 77–89 (brief bibliography). For the Veneto, see *Ritrovamenti monetali di età romana nel Veneto,* ed. G. Gorini (Padua, 1992–), 9 vols. of which have been published.

of Constantinople (751–811), 2 solidi of Benevento, and 14 Abbasid dinars (755–813); that of Hon (Norway; t.p.q. 855) contains 2 solidi (Constantine V, Syracuse, and Michael III, Constantinople), 6 Carolingian and 10 Abbasid coins (770–849) in a context that is more Mediterranean and western than Scandinavian; and that of Porto Torres (Sardinia; t.p.q. 902) holds 47 nomismata of Constantinople (830–879) and 3 Aghlabid dinars (874–902). Though closer to Byzantium, exchanges with the Bulgarians have left few monetary traces; nevertheless, finds of folles from the end of the ninth century and, especially, the tenth century on a site such as Pernik are thought to indicate commercial relations at local market level.[159]

On the other hand, there are clear signs of a developing trade with Russia and a revival of trade with central and western Europe around the year 1000 along the Danube and the Adriatic coastline. For one thing, the Byzantine finds that occur in increasing numbers along the course of the Dnieper, though very much in the minority compared with western denarii, consist of a mixture of coins, evidence that the "Varangian route to the Greeks" had a mercantile and not merely a military role. The imitation miliaresia of John I and Basil II that were struck in Kievan Rus, as well as in Finland, Sweden, and Denmark, demonstrate the extent of the coin's diffusion and reputation. Furthermore, the penetration of Byzantine coins within German, Austrian, and Slovenian territory, which had not completely stopped between 642 and 867, intensified. The anonymous folles (primarily A2) are present over a vast zone. In the Germanic lands and in France, these merely constitute isolated witnesses to the passage of merchants or pilgrims, but in northern Italy, as in Campania and Salerno, the follis was circulating properly and used as divisional money.

We know more about the development of international exchanges in the eleventh and twelfth centuries from textual sources than from monetary finds. The explanation for this discrepancy undoubtedly lies in the West's need for gold to meet its trading deficit with the Levant and the considerable costs of the crusades. Indeed, German, English, and French archival documents of this period, and even in the thirteenth century, often refer to the *bezant*. It would be wrong to interpret it as money of account or a generic term. The evolution of the *cens* due to the Holy See[160] shows, within the overall increase in gold payments as opposed to silver during the twelfth century, the progression of *bezants* in relation to indeterminate *aurei* of before 1130, even though they played a lesser role, compared with Muslim or imitation *marabotini* from Spain.

Relations with Foreign Coinages: Exchanging Byzantine Coins

Little is known about the exchange rates for Byzantine currencies and foreign coinages prior to the commercial revolution of the twelfth century. Reports from embassies, such as those of Liutprand and his father at the imperial court, say nothing about the

[159] I. Iurukova, "Monety," *Pernik* 2 (1983): 104–5, 169.

[160] A. Chédeville, "Recherches sur la circulation de l'or en Europe occidentale du Xe à la fin du XIIe siècle d'après les cens dus au Saint-Siège," *Le Moyen Age* 83 (1977): 413–43.

conditions under which ambassadors procured, in Venice (?) or in Constantinople, the Byzantine coins they needed to cover their expenses in the capital. Abundant though they are, documents in southern Italy tell us nothing about the rate of exchange between the tari and the nomisma, though a Venetian document of 1000 or 1001 indicates that 4 *bisantii aurei* were worth 2 pounds of denarii, or 1 nomisma 120 denarii,[161] whereas in Hungary, the nomisma (*pensa auri*), initially valued in trade at 30 denarii (of the Bavarian type, the prototype for the Hungarian coinage), was subsequently fixed at 40 deniers by Bela I (1061–63).[162] In the twelfth century, the various accounts of the crusades and a few Venetian documents give values for the hyperpyron expressed in a variety of denarii (in 1196 = 480 Venetian denarii) or in silver marks, corresponding to a weight between 28 g and 60 g of fine silver. According to Odo of Deuil, French Crusaders changed a *staminum* for 5 denarii (*parisis?*) in the Balkans, for 5 or 6 in Asia Minor, and for only 2 at Constantinople, thanks to the agreement that had been concluded with Manuel I. At 0.39 g of fine silver each, these 2 denarii that were exchanged for a piece with a theoretical value of 1/48 of a hyperpyron (3.65 g fine gold) imply a gold:silver ratio of 1:10.3, which is not far from the 1:11.9 ratio that has been deduced from the explicit accord drawn up between Frederick I and Isaac II, fixing the price of the mark (231.16 g silver) at 5½ hyperpyra (19.4 g gold), i.e., 1 hyperpyron to 42 g silver.[163]

The Venetian documents assembled by Bertelè allow us to follow the decline of the hyperpyron in terms of the hard currencies that replaced it as international media of exchange in the thirteenth century.[164] The currency market was henceforth open: the treaty of Nymphaion (1261) authorized the export of hyperpyra, and we know they also reached Venice where they were melted down. The export of silver and gold from Venice to the Levant was certainly far more important than currency movements between Venice and Constantinople. However, the galleys that transported silver to Constantinople and the Black Sea brought back gold, and Byzantine gold, along with gold from the Sudan, Germany, and Transylvania, continued to support the abundant minting of ducats that took off at the beginning of the fourteenth century. The rate of exchange for hyperpyra and ducats (see Table 7) was determined primarily by their respective precious metal content. However, the rate of 2 hyperpyra to a ducat in the middle of the fourteenth century overestimates the Venetian coinage by some 10% and

[161] B. Callegher, "Presenza di 'folles anonimi' in Italia settentrionale: Un'ipotesi interpretativa," *Numismatica e antichità classiche. Quaderni Ticinesi* 23 (1994): 293–312.

[162] B. Homan, "La circolazione delle monete d'oro in Ungheria dal X al XIV secolo e la crisi europea dell'oro nel secolo XIV," *RIN* (1922): 111.

[163] Hendy, "Coinage," 14, 21; A. E. Laiou, "Byzantine Trade with Christians and Muslims and the Crusades," in *The Crusades from the Perspective of Byzantium and the Muslim World,* ed. A. E. Laiou and R. Mottahedeh (Washington, D.C., 2001), 158–96. Bertelè, *Moneta veneziana,* 31–34. Fluctuations in the value of the hyperpyron, given that its precious metal content was stable, were due to the greater or lesser rigidity of the market and above all to variations in the gold:silver ratio.

[164] Bertelè, *Moneta veneziana,* appendix 3, 39–58 (figures in Venetian grossi have been converted to hyperpyra according to the number of grossi to the ducat in the relevant period).

Table 7
The Hyperpyron in Venetian Gold Ducats

Date		
1315	1 hyperpyron = ⅔ ducat	1 ducat = 1.5 hyperpyra
1323	1 hyperpyron = 0.58 ducat	1 ducat = 1.75 hyperpyra
1333	1 hyperpyron = 0.48 ducat	1 ducat = 2.08 hyperpyra
1367	1 hyperpyron = ½ ducat	1 ducat = 2 hyperpyra
		(accounts for the expedition of Amadeus IV of Savoy)
1382–91	1 hyperpyron = ⅖ ducat	1 ducat = 2.5 hyperpyra
1397–1411	1 hyperpyron = 3/10 ducat	1 ducat = 3⅓ hyperpyra
		(official exchange rate for galleys)
1413–20	1 hyperpyron = 0.26 ducat	1 ducat = 3 hyperpyra 18 carats
1432–52	1 hyperpyron = 0.28–0.34 ducat	1 ducat = 3 hyperpyra 12 carats to 22 hyperpyra 22 carats
		(Badoer and Barbarigo's accounts)

is evidence of the suspicion with which the "discredited" Byzantine coinage was viewed. Its fall cannot be attributed solely to the crisis of public finances.[165]

The declining value of the silver hyperpyron, compared with the ducat, dates from the turn of the fourteenth century. It antedated the reduction in fineness observed under John VIII (1425–48); in the same way, the reestablishment of the exchange rate with an average value of 3 hyperpyra to the ducat preceded the return under Constantine XI (1448–53) to the purity of the first issues in the fourteenth century. As might be expected in theory, this discrepancy shows that the essential element in fixing this rate was the evolution of the gold:silver ratio, itself influenced by mine production, which we know to have been particularly abundant in Serbia and Bosnia between 1400 and 1420, after which output again diminished.[166] The relative stability of the precious-metal coinage at the end of the empire affords a glimpse of the way the coinage was controlled privately and was thus removed from the imperial finances and their notorious indigence, quite the opposite situation to the one that undoubtedly prevailed from the beginning of the empire until the reign of the first Palaiologoi.

[165] F. C. Lane, "Exportations vénitiennes d'or et d'argent de 1200 à 1450," in *Etudes d'histoire monétaire,* ed. J. Day (Lille, 1984), 32–33; Hendy, *Studies,* 546–47; Morrisson, "Monnaie et finances dans l'Empire byzantin," 312–13.

[166] Spufford, *Money,* 349–51.