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Early bronze coinage of Athens

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“The development of a token base metal coinage for small denominations remains an important watershed.”¹ The use of bronze to produce a token coinage, as opposed to the precious metal coinages which had already gained wide acceptance in the Greek world in the sixth and fifth centuries BC, involved the acceptance of new, abstract concepts in regard to the use of money. It also required confidence in the issuing authority to offset the lack of recognised intrinsic value.² Numismatists have become increasingly interested in the development of bronze coinages in classical Greece and the problems which the evidence raises. The coins themselves, once thought of as poor relations to silver and gold, are now increasingly collected and analysed in their own right, and their significance in archaeology recognised.³ This article is concerned with the introduction of a regular bronze coinage in Athens in the fourth century BC. It will begin by briefly examining the development and function of bronze coinage in general terms along with economic conditions in Athens. It will then consider the evidence of bronze coinage being utilized in Athens before

the introduction of the regular bronze coinage, along with the arguments of various numismatists regarding these earlier strikings. The regular bronze coinage of the later fourth century will then be discussed. The existence of functioning bronze coinages in other states will be considered, along with the question of why the introduction of a regular bronze coinage in Athens appears to have been comparatively late.

Two influential papers by Martin Jessop Price published in 1968 and 1979 examined the development and function of early Greek bronze coinage.⁴ Here he argued that bronze coinage presupposes the development of a social economy using coins for everyday transactions: “a change in the social system of payment for labour, and of the general use of metals in the daily payments for the necessities of life.”⁵ Such a change is evidenced by an enormous increase in pieces of small value, in silver and, subsequently, bronze, along with the opening of a large number of mints.⁶ In such circumstances, a bronze coinage brought several distinct advantages. The most obvious one, cited by many authors in addition to Price, was the

convenience of using token bronze pieces to replace the tiny fractions of silver which had, of necessity, been minted to assist everyday retail transactions.⁷ In Athens the tiny silver pieces representing values as small as an eighth of an obol must have been extremely easy to misplace.⁸ Price also pointed out that an authority which issues a token coinage stands to make a considerable profit, and this could be a compelling motive for its introduction.⁹ In regard to the mints themselves, Catherine Grandjean noted that many of the earliest cities which coined bronze were cities fighting frequent expensive wars.¹⁰ The nominal value of bronze coins for internal use could be of considerable advantage.

The use of coinage of small denominations for local commercial transactions had certainly developed in Athens by the late fifth century BC. Victor Ehrenberg, in his study of the plays of Aristophanes, considered the many references to money, payments and prices.¹¹ The archaeological evidence from the Agora excavations tells a similar story of the everyday commercial activity which took place in the square itself and the surrounding streets, in large market buildings and small private shops.¹² State pay for jurors, for attendance at the Council and the Assembly, and for workers on periodic state building programmes presupposed and encouraged a cash based market with denominations of silver coins small enough to allow a

daily wage to be paid and used.¹³

Classical Athens therefore exhibited the type of economy which would favour the introduction of a bronze coinage. What is the evidence for bronze coinage in Athens? An early apparent issue of bronze in 406/5 BC, coins struck by Timotheos in 363-359 BC, small bronze “kollyboi”, and the regular, state produced, bronze coins of Athens will be examined in sequence.

Aristophanes’ *The Frogs* provides details of a “bronze” coinage struck in Athens in 406/405 BC during the closing years of the Peloponnesian War.¹⁴ This is the earliest textual reference to an official “bronze” coinage being struck in Athens. The passage has received considerable attention from numismatists throughout the 20th century, who generally agree that the issue consisted of silver-plated bronze coins such as those represented in the Peiraeus hoard found in 1902 (Fig. 1).¹⁵ John H. Kroll, in examining sixty drachms from the thousands of drachms and tetradrachms which originated in this hoard, confirmed Svoronos’ finding that the style is obviously contemporary with the gold coins struck in 407/6BC.¹⁶ His examination of the coins showed



Figure 1. Plated silver tetradrachm. 406/5 BC. 16.99g. (Courtesy of CNG. *Triton XII*, lot 247).

that the number of dies involved was improbably high for a forger's workshop, and he confidently concluded that these coins were not forgeries, as claimed by Adalberto Giovannini,¹⁷ but examples of the emergency "bronze" coins referred to by Aristophanes.¹⁸

Kroll also mentioned three unpublished plated triobols whose style agrees with that of the drachms, tetradrachms and with the contemporary gold coins.¹⁹ In 1993 Kroll wrote that no definite samples of this plated coinage had yet been found in the Agora excavations.²⁰ But neither has the Agora yielded any examples of unplated bronze coins which can be ascribed to the 406/405 BC issue. In 1976, 1979, 1993, and again in 2001, Kroll's examination of bronze coinage from the Athenian Agora confirmed his argument that regular, official coins of bronze were not struck in Athens until the third quarter of the fourth century BC.²¹

Kroll's arguments regarding the emergency issue of 406/405 BC have been widely accepted. Despite the continuing question of the "kollyboi", there is still no evidence for regular Athenian bronze coins pre-dating the later fourth century. The minting of a plated bronze emergency coinage was not a common expedient,²² and these coins were taken out of circulation at some point in the following decade, either when democracy was first restored or a little later.²³ Despite the fact that other cities were minting bronze, Athens obviously did not wish



Figure 2. Bronze coin issued by Timotheus at Olynthos. 1.22g; 10mm (Australian Centre for Ancient Numismatic Studies (ACANS) 09A25).

to continue with the coins for which Aristophanes expressed such disgust. Grandjean stated that this experiment was "a disaster", but gives no reasons for this judgement. Aristophanes, and presumably many Athenians, did not think well of the "wicked little bronzes", but this is not to say that the coins did not achieve their intent as token coinage during an emergency.²⁴

In 1960, E.S.G. Robinson drew attention to "an issue of obols and diobols in bronze instead of silver. They are real tokens, bronze for silver, with no trace of plating, but with marks of value: two pellets or one pellet."²⁵

These scarce coins, argued Robinson looking at stylistic similarities, could well have been struck in the same period as the plated bronze coins, or immediately after, and could be the coins referred to in Aristophanes' *Ekklesiazusai*, when the unfortunate gentleman is caught with demonetized bronze in his mouth.²⁶ The same intriguing coins are referred to by Price in his paper not published until 1968.²⁷ Here the Athenian general Timotheos was said to have issued bronze coins to his soldiers in 364 BC, but Price also stated that "no surviving coins have yet been attributed to this issue."²⁸ In a

subsequent paper (published, however, in 1967), Price and Robinson declared that Robinson's "scarce coins" were the coins issued by Timotheos.²⁹

"When Timotheos of Athens was campaigning against the Olynthians and found himself short of cash he struck bronze which he used to pay his troops" (*Oeconomica* ii, 2, 23).³⁰ Timotheos assured the soldiers that the coins would be accepted by merchants and tradespeople, to whom he had already guaranteed ultimate exchange in silver. This event would have occurred between 363 and 359 BC.³¹ Robinson and Price examined eight coins of the type pictured (Fig. 2). They noted a surprisingly high number of dies and the similarity to the silver triobol and trihemibol. These issues differed from other Athenian coins of the period in the following details: the head of Athena is turned to the left; the inscription ΑΘΗ; the corn-grain; and the pellets as marks of value. Six examples of the coins were found at Olynthos, the site of Timotheos' campaign, these being six of only seven bronze Athenian coins found during excavations. The authors concluded that the coins could be confidently identified with Timotheos, with the unique typology representing local production and the corn-grain possibly associated with the purpose of the coins to allow the purchase of food.³²

Robinson's and Price's identification was accepted by Kroll who in 1993 noted that further samples had since been identified: eight from the

Agora, one from the Pnyx excavations and three from Thebes.³³ The coin recently purchased for the Australian Centre for Ancient Numismatic Studies is an example of these very rare coins, being one of the larger of the two varieties described by Robinson and Price, with two pellets on the reverse. This issue, like the plated bronze issue of 406/405 BC, was an emergency issue, an irregular issue resorted to through necessity. Athenians, in general, still did not regard bronze coinage as desirable. It is important to note that the coins described by Robinson and Price, along with one plated drachm, are the only Athenian bronze coins excavated at Olynthos, a city which was destroyed by Philip II in 348 BC. This is significant, not only for the dating of the coins discussed above, but also for the dating of the first Athenian regular bronze coins, which are not present at Olynthos.³⁴

In 1912 and 1926 Svoronos published lists of over 600 varieties within a large number of small bronze pieces that were stamped on both sides with a letter or symbol (Fig. 3)³⁵.

He identified these small pieces, found throughout Attica, as "kollyboi",



Figure 3. Kollybos? Athens. Mid-late fourth century BC. Æ Eisiterion – Entrance Token. 3.10 g (courtesy of CNG).

a term found in literature dating from the 420s BC, including several references in Aristophanes' plays. This identification implied that the pieces were indeed small bronze coins in circulation and represented fractions of the obol. There has been much subsequent discussion of the "kollyboi", a name that has attached itself to these small bronze pieces. In 1945 M.N. Tod published epigraphical notes on "kollyboi", concluding that the term was used to denote a very small coin or weight of unspecified but trifling value.³⁶ Tod believed it unlikely that "kollyboi" entered into Athenian commercial transactions during the fourth and following centuries, because inscriptions recording sums of money do not mention or symbolise the "kollyboi."³⁷ More recent numismatists have remained uncertain as to the function of these small bronze pieces. Robinson believed that they might have been used as money during the Peloponnesian War, along with the larger plated bronze, but ceased to be used as money subsequently.³⁸ Price pointed out that there was no connecting pattern to suggest a single issuing body and concluded that they must be the issues of private individuals. If they functioned as money, he suggested, it would be as additional small change of an unofficial nature, a bronze equivalent of small denominations of silver, or as an even smaller fraction.³⁹

In 1993 Kroll suggested that the small bronzes, mostly dating to the fourth century with perhaps a few being

late fifth century, were typologically related to larger Athenian lead and bronze "symbola" used as pay vouchers, seating tokens in the theatre and for other civic purposes. He also pointed to the lack of typological similarity between the small bronzes and any other monetary issue. A monetary interpretation for "symbola" had been rejected. Kroll therefore questioned Price's claim that these small pieces were produced and functioned as small change.⁴⁰ Unless further evidence is recovered, the small bronze pieces, possibly equating to "kollyboi", remain something of a problem. They were apparently not an official issue of coinage.

Kroll remarked in 1979 that fourth and third century BC bronze coins had received little serious attention "no doubt because they are among the least glamorous strikings in the Athenian corpus."⁴¹ In his 1979 study devoted to this material, Kroll analysed coins recovered from four sources: an important hoard of 104 coins from the Agora (deposit A 18:8), the coins from two Ptolemaic forts (one in Eastern Attica, one within Athens), and two purses found corroded together in the courtyard of the Dipylon Gate in the Kerameikos. From a careful comparative analysis he was able to build up a relative sequence of varieties and then establish an absolute chronology for the coins.⁴² In describing the earliest issue of bronze coins, Variety A (Fig. 4), Kroll noted that it was the only variety



Figure 4. Athens. Early or mid-330s and 322/317 BC. 1.49g and 2.21g. Kroll Variety A (Kroll *Athenian Agora* 41-43). ACANS 01AT5-6.

to employ the style and reverse type of the contemporary Athenian silver.⁴³ Subsequently, bronze and silver went separate ways, although both continued to use Athena on the obverse, an owl or owls on the reverse, and the Athenian legend. Later bronze varieties passed through two iconographical stages: the first with the obverse head in an Attic helmet and the reverse type of two facing owls; the second with the obverse head in a Corinthian helmet and the reverse type of a single owl.⁴⁴

Kroll dated variety A to no earlier than c.350 BC. No examples of variety A, or later varieties, have been found at Olynthos, which has yielded large numbers of pre-348 BC bronze coins from all over the Greek mainland.⁴⁵ The style of the obverse Athenian head was characteristic of Athenian silver c.340 to 294 BC; and the archaeological contexts of Agora finds of these coins date to the third quarter of the fourth century. An inscription of 329/328 BC records sums of money down to the chalkous, implying that bronze coinage had been instituted by that date.⁴⁶ Variety A represented a large output and probably a lengthy period of minting of about two decades. This would imply that it was

introduced close to the middle of the century, possibly under the innovative financial administration of Eubulus (358-342 BC).⁴⁷

In 1993 Kroll published his important study of some 17,000 coins recovered in excavations at the Athenian Agora.⁴⁸ Of these, all but 13% were Athenian bronze. Very few were silver. Variety A is represented by no less than 929 Agora specimens.⁴⁹ Here he proposed a later date for the introduction of the coinage, possibly the 330s BC. Further evidence will be needed to refine this date.⁵⁰

The bronze coins of Athens from the mid fourth to the late first century BC were struck in the Agora mint, identified as a large square building in the south east corner of the Athenian Agora.⁵¹ Here lumps of bronze, coin blanks and bronze rods from which flans were struck have been found and analysed.⁵² Archaeologically, the evidence dates from the late fourth century BC and thus accords with Kroll's dating of regular bronze coinage.⁵³ Metallurgical analysis of coins and blanks has allowed a correlation and the suggested dating of the blanks agrees with contextual pottery dating.⁵⁴ The construction of

the building in the late fifth century BC, along with the lack of any evidence for the striking of silver in this building, raises questions. What was the original function of the building if not for the striking of bronze coins? Camp and Kroll are able to make several suggestions, but give no answers: the Eleusinian bronze, which is discussed below, might well have been struck here after 350 BC; before this, the building may have produced weights and measures, or even Salamis bronze coins, interesting suggestions, but not yet supported by evidence.⁵⁵

Kroll's 1979 chronology of Athenian bronze coins integrated coins bearing an Eleusis legend along with those featuring Eleusinian imagery and an Athens legend (Fig. 5). In doing so he treated the coins, featuring Triptolemos on the obverse and a sacred pig on the reverse, as coins struck by Athens and developed in parallel with their regular Athenian counterparts.⁵⁶ These coins of Eleusis, an Athenian dependency and site of the Eleusinian Mysteries, had been previously published and analysed by Margaret Thompson in 1942.⁵⁷

Thompson argued that the coins were festival pieces, struck by Athens for

the periodic observance of the Greater Eleusinia where the annual Mysteries coincided with the celebration of games. She observed that the abundance of the coins, their variety and their stylistic development indicated minting over a considerable period, and pointed to a similarity in fabric, style and size to coins of the regular Athenian bronze of the late fourth and early third centuries BC.⁵⁸ She concluded by proposing a sequence of Eleusinian coins based on four yearly intervals and spanning the mid fourth to the first century.⁵⁹

Kroll's 1979 and 1993 catalogues and chronologies drew upon Thompson's analysis, but discarded her argument that the coins were struck at four yearly intervals for the Greater Eleusinia. Instead, he claimed that the coins were more generally associated with the annual Eleusinian Mysteries. These events were attended by Greeks from many countries, and involved days of festivities. A festival coinage, consisting of small denomination bronze coins would serve the needs of visitors for small change.⁶⁰ In 1993 and 2001 Kroll dated the Eleusinian coins before the regular Athenian coins, with fourteen separately marked Eleusinian issues being issued from the 350s, and the regular coins appearing in the mid 330s and coming after a positive experience with the festival strikings.⁶¹

Martin Jessop Price had, as stated previously, outlined the early development of Greek bronze coinage in an important essay in 1968. Here he



Figure 5. Eleusis (minted in Athens?). 3.15g. 16mm. Kroll Variety K (Kroll *Athenian Agora* 38). ACANS (Marr Coll.).

presented the coinage of several cities in Sicily and South Italy, where regular bronze coinage was established before the last quarter of the fifth century BC. In mainland Greece, Macedon had established regular bronze issues in the late fifth century.⁶² The excavations at Olynthos, destroyed in 348 BC, show that the new medium had become widespread over the north of Greece, and in the cities of Thessaly and the Peloponnese by the mid fourth century.⁶³ Since 1968 much more analysis has been done. Recent studies of coins minted at Syracuse (John Morcom) and at Sikyon (Jennifer Warren), and of bronze coins found at Nemea (R.C. Knapp and J.D. Mac Isaac), for example, are altering our understanding of the earliest history of Greek bronze coinages.⁶⁴ Why did Athens appear to lag behind in the introduction of such a coinage?

This question implies a criticism of Athens, an accusation of tardiness in failing to recognise the obvious advantages of a bronze coinage. It is possible, however, to see Athens in a more positive light. This view would stress the development of a high quality silver coinage in Athens in the fifth century BC, which was well regarded by trading partners and functioned almost as a form of international exchange.⁶⁵ Its type was appropriate to Athens and easily recognised. It maintained its weight and high silver content. Athenians were proud of this coinage, as evidenced in Aristophanes' *The Frogs*. When Athens did introduce

bronze coins in 406/5 BC they did so through necessity: the lack of silver had created an emergency. Perhaps for psychological reasons, the copper was plated to maintain a fiction of being silver.⁶⁶ When peace and political conditions allowed, Athens quickly restored her silver, showing an understandable desire to restore its recognisable qualities and typology. Nikophon's law regarding silver, inscribed on a marble stele uncovered in the Agora excavations in 1970 and published by R.S. Stroud,⁶⁷ is evidence of an Athenian concern with the quality, and the recognition of this quality, of silver coins. The need for small change was met by the striking of very small denominations of silver. Athens could perhaps be praised for a cautious approach to the adoption of what was still a fairly recent innovation, at least in the earlier fourth century BC, and one which required absolute confidence in the issuing authority. Grandjean suggested that the quick restoration of silver coinage, with the return of democracy in Athens in 403 BC, and the delayed adoption of bronze could be considered thoughtful measures "taken to buttress the new democratic regime and avoid any risk of stasis."⁶⁸

This view appears a viable alternative to criticisms of Athenian conservatism in regard to both the introduction of bronze and the retention of the fifth century typology of Athena/Owl/and legend. One wonders if some modern numismatists are judging the

consistency of the typology from their own interest in variety and thus use terms such as “uniform to the point of monotony” and showing “no more sign of artistic enterprise in the fourth century than in the fifth.”⁶⁹ Some recent studies of the delayed introduction of bronze in Athens stress political and symbolic reasons. Jeremy Trevett, for example, whilst linking democracy, somewhat arbitrarily, to the use of coined money, then blamed democracy in Athens for conservatism in adopting the innovation of bronze.⁷⁰ Trevett cited L. Kurke, *Coins, Bodies, Games and Gold* (1999), who suggested that silver was symbolically associated with democracy.⁷¹ Both Kroll and Grandjean have argued against this emphasis on political symbolism. Grandjean noted that silver and democracy were never fundamentally connected in Greek thought and stressed economic reasons for Athenian decisions in the fourth century rather than symbolic ones.⁷² Kroll, in a review of Kurke, stated that no one would deny the symbolic and political dimension of coins, but their primary use was for utilitarian, fiscal purposes.⁷³ He dismissed the association of democratic governments with the initial introduction of coinage, pointing out that most archaic Greek coinages were inaugurated by aristocratic governments.⁷⁴

In conclusion, it can be said that a regular bronze coinage (which carried the name of the Athenians) was introduced into Athens (according to

current evidence and analysis) during the decade 340 - 330 BC. Athens had previously utilized an emergency striking of silver-plated bronze coins to represent silver in 406/405 BC. Timotheos struck bronze in the name of Athens, due to necessity, between 363 and 359 BC. Shortly afterwards, when bronze coinage had been introduced in many Greek cities, Athens issued an Eleusinian coinage of bronze for the purpose of the annual festivals. A regular Athenian bronze coinage followed. By this time the innovation had proved viable, and Athens acted in confidence that such coinage could complement the silver in meeting economic and social needs.

Bibliography

Ancient sources

Melville Jones, John R. (1993) *Testimonia Numaria: Greek and Latin Texts Concerning Ancient Greek Coinage. Vol. I, Texts and Translations*, London.

Melville Jones, John R. (2007) *Testimonia Numaria: Greek and Latin Texts Concerning Ancient Greek Coinage. Vol. II, Addenda and Commentary*, London.

Modern studies

Camp, John M. (1992) *The Athenian Agora: Excavations in the Heart of Classical Athens*, London.

Camp, John McK. and John H. Kroll (2001) ‘The Agora Mint and Athenian Bronze Coinage’, *Hesperia*, Vol. 70, no. 2: 127-162.

- Ehrenberg, Victor (1962) *The People of Aristophanes: a Sociology of Old Attic Comedy*, New York.
- Giovannini, Adalberto (1975) 'Athenian Currency in the Late Fifth and Early Fourth Century B.C.', *Greek, Roman and Byzantine Studies*, Vol. 16, no. 2: 185-195.
- Grandjean, Catherine (2006) 'Athens and Bronze Coinage'. In: *Agoranomia: Studies in Money and Exchange presented to John H. Kroll*, Peter G. Van Alfen (Ed.). New York: 99-108.
- Howgego, Christopher (1995) *Ancient History from Coins*, London.
- Jenkins, G.K. (1990) *Ancient Greek Coins*, 2nd rev. ed., London.
- Knapp, Robert C. and John Mac Isaac (2005) *Excavations at Nemea III. The Coins*, Berkeley.
- Kraay, Colin M. (1976) *Archaic and Classical Greek Coins*, London.
- Kroll, John H., (1976) 'Aristophanes' *πονηρὰ χαλκία*: A Reply', *Greek, Roman and Byzantine Studies*, Vol. 17, no. 4: 329-341.
- Kroll, John H. (1979) 'A Chronology of Early Athenian Bronze Coinage ca. 350-250 B.C.'. In: *Greek Numismatics and Archaeology: Essays in Honor of Margaret Thompson*, Otto Mørkholm and Nancy M. Waggoner (Eds), Wetteren, Belgium: 139-154.
- Kroll, John H. (1993) 'The Greek Coins', *The Athenian Agora*, Vol. 26, Princeton.
- Kroll, John H. (2000) 'Review of *Coins, Bodies, Games, and Gold: the Politics of Meaning in Archaic Greece*, by Leslie Kurke', *The Classical Journal*, Vol. 96, no. 1: 85-90.
- Kurke, L. (1999) *Coins, Bodies, Games, and Gold: the Politics of Meaning in Archaic Greece*, Princeton, N.J.
- Morcom, John. (1998) 'Syracusan Bronze Coinage in the Fifth and Early Fourth Centuries BC'. In: *Studies in Greek Numismatics in Memory of Martin Jessop Price*, Richard Ashton and Silvia Hunter (Eds), London: 287-291.
- Price, M.J. (1968) 'Early Greek Bronze Coinage'. In: *Essays in Greek Coinage Presented to Stanley Robinson*, C.M. Kraay and G.K. Jenkins (Eds), Oxford: 90-104.
- Price, M.J. (1979) 'The Function of Early Greek Bronze Coinage', *Annali dell'Istituto Italiano di Numismatica*, 25, *Supplemento*: 351-365.
- Psoma, S. (2001) *Olynthe et les Chalcidiens de Thrace*, Stuttgart.
- Robinson, E.S.G. (1960) 'Some Problems in the Later Fifth Century Coinage of Athens', *The American Numismatic Society Museum Notes*, IX: 1-15.
- Robinson, E.S.G and M.J. Price (1967) 'An Emergency Coinage of Timotheos', *Numismatic Chronicle*, Ser. 7, Vol. 7: 1-6.
- Stroud, Ronald S. (1974) 'An Athenian Law on Silver Coinage', *Hesperia*, 43, no. 2: 157-188.
- Svoronos, J.N. (1923-1926) *Les*

monnaies d'Athènes, Munich.

- Thompson, Margaret (1942) 'Coins for the Eleusinia', *Hesperia*, Vol. 11, no. 3: 213-229.
- Thompson, Wesley E. (1966) 'The Functions of the Emergency Coinages of the Peloponnesian War', *Mnemosyne*, Ser. 4, Vol. 19, no. 4: 337-343.
- Tod, M.N. (1945) 'Epigraphical Notes on Greek Coinage', *Numismatic Chronicle*, 6th series, Vol. 5: 108-116.
- Trevett, Jeremy (2001) 'Coinage and Democracy at Athens'. In: *Money and its Uses in the Ancient Greek World*, Andrew Meadows and Kirsty Shipton (Eds), Oxford: 23-34.
- Warren, Jennifer A.W. (1998) 'Updating (and Datedating) the Autonomous Bronze Coinage of Sikyon'. In *Studies in Greek Numismatics in Memory of Martin Jessop Price*, Richard Ashton and Silvia Hunter (Eds), London: 347-361.
- Sikyon': 348.
4. M.J. Price (1968) 'Early Greek Bronze Coinage': 90-104; M.J. Price (1979) 'The Function of Early Greek Bronze Coinage': 351-365.
 5. Price (1979) 'Function of Early Greek Bronze Coinage': 358.
 6. Price (1968) 'Early Greek Bronze Coinage': 92.
 7. Howgego (1995) *Ancient History from Coins*: 7, 113; G.K. Jenkins (1990) *Ancient Greek Coins*: 3; Victor Ehrenberg (1962) *The People of Aristophanes: a Sociology of Old Attic Comedy*: 221; Grandjean (2006) 'Athens and Bronze Coinage': 100.
 8. Ehrenberg (1962) *People of Aristophanes*: 221; John H. Kroll (1993) 'The Greek Coins': 26.
 9. Price (1968) 'Early Greek Bronze Coinage': 91.
 10. Grandjean (2006) 'Athens and Bronze Coinage': 100.
 11. Ehrenberg (1962) *People of Aristophanes*: 219ff.
 12. John M. Camp (1992) *The Athenian Agora: Excavations in the Heart of Classical Athens*: 14, 135.
 13. Howgego (1995) *Ancient History from Coins*: 19.
 14. John R. Melville Jones (1993) *Testimonia Numaria: Greek and Latin Texts Concerning Ancient Greek Coinage. Vol. I, Texts and Translations*: 56-57.
 15. E.S.G. Robinson (1960) 'Some Problems in the Later Fifth Century Coinage of Athens': 1-15; Wesley E. Thompson (1966) 'The Functions of the Emergency Coinages of the Peloponnesian War': 337-343.
 16. John H. Kroll (1976) 'Aristophanes'

Notes

1. Christopher Howgego (1995) *Ancient History from Coins*: 7.
2. Catherine Grandjean (2006) 'Athens and Bronze Coinage': 104.
3. See, for example, the important study of the 4th century BC bronze issues of the Chalcidian League and the Bottiaeans, S. Psoma (2001) *Olynthe et les Chalcidiens de Thrace*; John Morcom (1998) 'Syracusan Bronze Coinage in the Fifth and Early Fourth Centuries BC': 287; Jennifer A.W. Warren (1998) 'Updating (and Datedating) the Autonomous Bronze Coinage of

- ‘πονηρὰ χαλκία’: A Reply’: 329-341.
17. Adalberto Giovannini (1975) ‘Athenian Currency in the Late Fifth and Early Fourth Century B.C.’: 189.
18. Kroll (1976) ‘Aristophanes’: 331-334.
19. *Ibid.*: 334.
20. Kroll (1993) ‘The Greek Coins’: 7.
21. Kroll (1976) ‘Aristophanes’; John H. Kroll, (1979) ‘A Chronology of Early Athenian Bronze Coinage ca. 350-250 B.C.’: 139-154; Kroll (1993) ‘The Greek Coins’; John McK. Camp and John H. Kroll (2001) ‘The Agora Mint and Athenian Bronze Coinage’: 144.
22. Howgego (1995) *Ancient History from Coins*: 113.
23. Grandjean (2006) ‘Athens and Bronze Coinage’: 102.
24. Robinson (1960) ‘Some Problems in the Later Fifth Century Coinage of Athens’: 8ff; Thompson (1966) ‘The Functions of the Emergency Coinages of the Peloponnesian War’: 339ff.
25. Robinson (1960) ‘Some Problems in the Later Fifth Century Coinage of Athens’: 13-14.
26. *Ibid.*
27. Price (1968) ‘Early Greek Bronze Coinage’: 90.
28. *Ibid.*: 100.
29. E.S.G. Robinson and M.J. Price (1967) ‘An Emergency Coinage of Timotheos’: 1-6.
30. Quoted in Robinson and Price (1967) ‘An Emergency Coinage of Timotheos’: 1.
31. *Ibid.*: 2.
32. *Ibid.*: 5.
33. Kroll, (1993) ‘The Greek Coins’: 26; Kroll (1979) ‘A Chronology of Early Athenian Bronze Coinage’: 147-148; Grandjean (2006) ‘Athens and Bronze Coinage’: 103.
34. Kroll (1979) ‘A Chronology of Early Athenian Bronze Coinage’: 147-148.
35. J.N. Svoronos (1923-1926) *Les monnaies d’Athènes*; An earlier article published in *JIAN* in 1912 is discussed by Price (1968) ‘Early Greek Bronze Coinage’: 100; M.N. Tod (1945) ‘Epigraphical Notes on Greek Coinage’: 112; and Kroll (1993) ‘The Greek Coins’: 24.
36. Tod (1945) ‘Epigraphical Notes on Greek Coinage’: 111ff.
37. *Ibid.*: 113.
38. Robinson (1960) ‘Some Problems in the Later Fifth Century Coinage of Athens’: 5-7.
39. Price (1968) ‘Early Greek Bronze Coinage’: 100. Price again discussed the small pieces at a conference published in 1979 (Price (1979) ‘The Function of Early Greek Bronze Coinage’: 356-7, 359-363). One participant questioned the notion that a state could condone the profit made by private issuers of “token money.” Price replied that, if it were handed out by individuals, then they themselves would redeem the objects. Perhaps they were shopkeepers’ internal tokens, a device like later Roman lead tesserae.
40. Kroll (1993) ‘The Greek Coins’: 24.
41. Kroll (1979) ‘A Chronology of Early Athenian Bronze Coinage’: 139.
42. *Ibid.*: 141, 143ff.
43. *Ibid.*: 143.
44. *Ibid.*
45. *Ibid.*: 147.
46. *Ibid.*: 148.
47. *Ibid.*
48. Kroll (1993) ‘The Greek Coins.’
49. *Ibid.*: 31.

50. *Ibid.*
51. Camp and Kroll (2001) 'The Agora Mint and Athenian Bronze Coinage': 127; Camp (1992) *The Athenian Agora*: 128.
52. Camp and Kroll (2001) 'The Agora Mint and Athenian Bronze Coinage': 133, 139.
53. *Ibid.*: 142.
54. *Ibid.*: 57.
55. *Ibid.*: 144-5.
56. Kroll (1979) 'A Chronology of Early Athenian Bronze Coinage': 139-154.
57. Margaret Thompson (1942) 'Coins for the Eleusinia': 213-229.
58. *Ibid.*: 213-214.
59. *Ibid.*: 218ff.
60. Kroll (1993) 'The Greek Coins': 27-29.
61. *Ibid.*: 27-30; Camp and Kroll (2001) 'The Agora Mint and Athenian Bronze Coinage': 144.
62. Price (1968) 'Early Greek Bronze Coinage': 90-104.
63. *Ibid.*: 99; S. Psoma (2001) *Olynthe et les Chalcidiens de Thrace*, Stuttgart.
64. Morcom (1998) 'Syracusan Bronze Coinage'; Warren (1998) 'Updating (and Datedating) the Autonomous Bronze Coinage of Sikyon'; Robert C. Knapp and John Mac Isaac (2005) *Excavations at Nemea III. The Coins*.
65. Camp (1992) *The Athenian Agora*: 131.
66. Kroll (1976) 'Aristophanes': 338.
67. Ronald S. Stroud (1974) 'An Athenian Law on Silver Coinage': 157-188.
68. Grandjean (2006) 'Athens and Bronze Coinage': 106.
69. Robinson (1960) 'Some Problems in the Later Fifth Century Coinage of Athens': 1; Jenkins (1990) *Ancient Greek Coins*: 63.
70. Jeremy Trevett (2001) 'Coinage and Democracy at Athens': 23-32.
71. L. Kurke (1999) *Coins, Bodies, Games, and Gold: the Politics of Meaning in Archaic Greece*.
72. Grandjean (2006) 'Athens and Bronze Coinage': 106.
73. John H. Kroll (2000) 'Review of *Coins, Bodies, Games, and Gold: the Politics of Meaning in Archaic Greece*, by Leslie Kurke': 90.
74. *Ibid.*: 87.

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