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THE REMINTING OF ATHENIAN SILVER COINAGE, 353 B.C.

For George Cawkwell in his 91st year

ABSTRACT

Combining evidence from Athenian silver coins, an unpublished Agora inscription, and several accounts concerning historical figures, this article reconstructs the Athenian program of 353 B.C. whereby all of the larger-denomination silver coinage in the city was demonetized and called in for restriking as a means of raising revenue during the fiscal crisis in the aftermath of the Social War. The folded-flan technique and erratic, substandard appearance of the resulting "pi-style" coins, attestations of their hurried production in that year, were retained in all subsequent Athenian silver coinage down into the 3rd century as recognized attributes of good Athenian money.

REMINTING FOR PROFIT

Although the reminting of old and worn coins into fresh new ones must have been a fairly routine practice in antiquity, it is notable that the three extant literary passages that recount episodes of reminting in ancient Greece pertain not to the recycling of worn coinage but to the restriking of all of a city's coins, regardless of their condition, specifically as a means of raising revenue for the state.[1]

In a list of revenue-raising ploys attributed to the 6th-century Athenian tyrant Hippias, the pseudo-Aristotelian *Oeconomica* (1347a8–11) relates

1. This article has greatly benefited from the expertise, suggestions, and generosity of a number of colleagues: John Camp, Michael Crawford, Thomas Figueira, Robert Hoge, Lisa Kallet, Irini Marathaki, Josiah Ober, Molly Richardson, Alan Stahl, Richard Stone, Ronald Stroud, Peter van Alfen, and Alan Walker. I thank them all, as well as Despoina Evgenidou, Director of the Numismatic Museum, Athens, and her staff for facilitating my examination of the pi-style hoards in the museum. For assistance with the coins photographed for illustration, I am grateful to Amelia Dowler at the British Museum, Craig Mauzy at the Athenian Agora, and the staff of the American Numismatic Society. With the exception of Fig. 12, all photographs of coins in the British Museum (BM) and the American Numismatic Society (ANS) are by the author (© J. H. Kroll, image reproduction for noncommercial purposes, courtesy of the Trustees of the British Museum or of the American Numismatic Society). Chronological designations in this article are B.C.

The 4th-century silver coinage of the Delphic Amphictyony is the one well-documented instance of a Greek coinage that was minted entirely from the melting down of a miscellany of old coinages (Raven 1950; Kinns 1983; Melville Jones 1993 and 2007, no. 212).

that "he also made the coinage existing among the Athenians legally invalid *(adokimon),* and, having fixed a price, ordered them to bring it to him; and after they had come together for the purpose of striking another type *(character),* he gave back the same silver money *(argurion)*."[2] Whether Hippias simply returned the coins unchanged, as is generally understood,[3] or struck a new coinage from the same metal,[4] he made a nice profit by demonetizing and so devaluing all of the coinage in the state and requiring that it be exchanged for the legally acceptable *(dokimon)* coinage that he issued at a higher value.

The reminting schemes described in the two other passages are notable for their extreme overvaluations of the new coinage. These were the schemes attributed to the 4th-century rulers Dionysios I of Syracuse (405–367) and Leukon I of the Cimmerian Bosphoros (389–348). In need of money, Dionysios ([Arist.] *Oec.* 1349b27–33) and Leukon (Polyaenus, *Strat.* 6.9.1) called in the existing coinage, struck (or countermarked?) it with a new type *(character),* and reissued it at double its original value, enabling them to return half of the silver to the citizenry in notionally full repayment while retaining the rest of the silver for their own use. Dionysios is said to have called in the coinage by decreeing death for noncompliance, whereas Leukon (having, like Hippias, demonetized the existing coinage) "announced that he was going to strike another coinage and that everyone had to bring to him the coinage they had, so that after restriking it would become acceptable *(dokimon)*."[5]

These are entertaining stories about cunning, avaricious tyrants and need not all be accepted as historical fact. Even so, the accounts collectively illustrate how fundamentally Greek coinage was subject to state control and how fully Greek governments were able to manipulate this control for monetary gain. The control consisted in the first instance of the state's authority to define what money was acceptable as legal tender *(dokimon)* in its territory of jurisdiction, and what was not *(adokimon)*.[6] Along with this came the opportunity for the state to issue its coinage with a value-added premium, giving it what may be called an "official value" as opposed to its intrinsic bullion or "melt" value.[7]

2. Τό τε νόμισμα τὸ ὂν Ἀθηναίοις ἀδόκιμον ἐποίησε, τάξας δὲ τιμὴν ἐκέλευσε πρὸς αὐτὸν ἀνακομίζειν. Συνελθόντων δὲ ἐπὶ τῷ κόψαι ἕτερον χαρακτῆρα, ἐξέδωκε τὸ αὐτὸ ἀργύριον. Trans. Melville Jones 1993, no. 54, with modifications.

3. Boeckh 1886, pp. 690–691; van Groningen 1933, p. 72; Kraay 1964, p. 90; 1976, p. 322, n. 3.

4. So Picard 1974, understanding *argurion* not as "money," but in its second sense as equivalent to *arguron* (silver).

5. Λεύκων χρημάτων δεόμενος ἐκήρυξεν, ὅτι μέλλοι κόπτειν ἄλλο νόμισμα καὶ δέοι προσφέρειν αὐτῷ τὸ ὑπάρχον ἑκάστῳ, ὅπως μετακοπὲν δόκιμον γένοιτο. Trans. author, after Krentz and Wheeler 1994, p. 575.

6. On the legal categories of *dokimon* vs. *adokimon nomisma,* with full citations and bibliography, see Figueira 1998, pp. 398–399. Intrinsic to the principle of a legally supported state currency, the categories probably date back to when Greek cities first began to coin (if not earlier, for specifying forms of "acceptable" and "unacceptable" means of payment in public contexts). Payment in *chremata dokima* is specified in a Late Archaic law from Eretria (*IG* XII.9, 1273/74 = Melville Jones 1993 and 2007, no. 48, lines 2–3). And in the great silver hoard of the early 5th century recovered near the port of ancient Tarentum (*IGCH* 1874), we seem to have our earliest confirmation that Greek cities that minted coinages did so with the purpose of making them the sole authorized currency for public and private transactions; consisting entirely of foreign specie, the deposit was likely the stock of a money changer who had accumulated it in exchange for the Tarentine coinage needed for doing business in the city (Kroll 2008, pp. 30–31).

7. Bogaert 1968, p. 316 (followed by Le Rider 1989, p. 161), also identifying a third category of value, a coinage's "market price," which was its demand-determined value outside its protected home territory.

The best documentation for such overvaluation is to be found in a partially preserved sentence in the 5th-century Athenian Coinage and Standards Decree that refers to the conversion of non-Athenian into Athenian coins and specifies a deducted charge of a certain number of drachms per 100 drachms of the recoined silver.[8] Although the number of deducted drachms is missing and must be restored in the text, scholars have consistently identified three or five as epigraphically the most probable figure, thus allowing coined Athenian silver a premium of 3 or 5% over the same amount of silver by weight (see pp. 236–237, below). Whether this premium, whatever its amount, was simply a minting fee to cover the cost of manufacture or whether it might also have included seigniorage, a modest tax on the minting for state profit, the important fact is that there was a premium, which remained in effect as long as the coinage was recognized as the officially authorized currency of the state. Should the state demonetize it by declaring it unacceptable as legal tender,[9] the coinage, no longer able to function as money, would revert to the premium-free status of bullion. According to the sources, this is what Hippias and Leukon arranged and why Hippias was able to buy back the invalidated coins at a discount of his own choosing. While he reissued the same money (or silver), presumably with the conventional premium restored, Dionysios and Leukon restruck the nullified coins of their cities in order to reissue them with a new, exorbitant overvaluation.

It would be mistaken to conclude from these anecdotes, however, that such exploitation of the state coinage was practiced by autocratic rulers alone. The emphasis of the narratives is on the deception that these autocrats sprang on the populace when their new coinage was issued. That reminting itself, without deception, could be a perfectly legitimate means for obtaining state revenue is clear from strong numismatic and epigraphical evidence showing that the Athenian state resorted to such a program of recoining to help alleviate the fiscal crisis resulting from the Social War (357–355).

8. *IG* I^3 1453C (Aphytis fragment), lines 11–13 = Composite text, section 5. For the restoration of these lines, see, e.g., Meiggs and Lewis 1969, no. 45; and below, n. 23.

9. Instances of such declarations are to be found in Ar. *Eccl.* 821, where the herald cries that bronze money is no longer to be accepted (μὴ δέχεσθαι), and in *IC* IV 162 (= Melville Jones 1993 and 2007, no. 334), lines 3–7, a law of Gortyn from the 3rd century when the city was introducing a bronze coinage and decreed that no silver obols were to be accepted (μὴ δέκετθαι). The verb δέχεσθαι is the operative technical term also in laws that define what coinages are acceptable as legal tender: the Athenian currency law of 375/4 (Rhodes and Osborne 2003, no. 25 = Melville Jones 1993 and 2007, no. 91), line 3; the late-2nd-century decree of the Delphic Amphictyony *CID* IV 127 (= Melville Jones 1993 and 2007, no. 226), line 2; and the 3rd-century treaty of *sympoliteia* between Smyrna and Magnesia ad Sipylum that prescribes the acceptance (δεχέσθωσαν) of the lawful coinage of one city (τὸ νόμισμα τὸ τῆς πόλεως [ἔνν]ομον) at the other (Schmitt 1969, no. 495 = Melville Jones 1993 and 2007, no. 378, line 55). The 4th-century Olbian law requiring that all buying and selling in the city be transacted in Olbian coinage (Dubois 1996, no. 21 = Melville Jones 1993 and 2007, no. 349), lines 13–16, is more explicit (Πωλεῖν δὲ καὶ ὠν[εῖισθαι] πάντα πρὸς τὸ νόμισμα τὸ τῆ[ϛ] πόλ]εως, πρὸς τὸν χαλκὸν καὶ τὸ ἀργυριο[νι τὸ] Ὀλβιοπολιτικόν) and even specifies penalties for buying or selling with any other currency.

PI-STYLE TETRADRACHMS

The primary evidence is provided by the reminted coins themselves, which initiated the huge Athenian owl coinage of the second half of the 4th century, the coinage that has come to be known as the "pi-style" coinage. This is the third of the three main phases of Athenian owl tetradrachms illustrated in this article. The first is the later 5th-century phase (Fig. 2), characterized by a lingering archaism in the rendering of Athena's eye; the second phase (Fig. 4), in which the eye of the goddess is shown in full profile, was minted over the first half of the 4th century. The "pi-style" designation of the third phase (Figs. 5–9) refers to the floral helmet ornament on the coins' obverses, which on the most advanced and numerous coins in the series is configured like the Greek letter pi bisected by a long central tendril (see Fig. 1, with Fig. 9:a–e, below, all illustrating Pi V–type tetradrachms).[10]

Jean Bingen's analysis of the 292 pi-style tetradrachms in a hoard excavated in 1969 from beneath the floor of a house at Thorikos in eastern Attica (hoard **3**, see Appendix 2) remains the most detailed study of the coinage to date.[11] Deducing that the coinage as a whole extended from near the middle of the 4th century down to ca. 295,[12] Bingen identified five stages in the evolution of the obverse helmet ornament (Fig. 1).[13] The ornament on the Pi I tetradrachms (Fig. 5:a–d) continues the relatively naturalistic form of the ornament of the preceding, earlier 4th-century tetradrachms (Fig. 4:a–e); this ornament is composed of four lines: a long, axial vertical, a curved horizontal that crosses it at the top, and two short lower branches that spring diagonally out from the vertical at its middle. On the Pi II obverses (Fig. 6:a–d), the lower branches are lengthened and spring higher up from the point where the vertical axis and the curved horizontal intersect. In further developments (Pi III and IV; see Fig. 8:a–g), the outside tendrils move outward from each other along the curved horizontal and have become verticals paralleling the central tendril, which can be exceptionally long, extending down to Athena's ear. The final form of the ornament (Pi V, Fig. 9:a–e) is characterized by its relatively square shape and a shorter central tendril that reaches no farther than the upper edge of her helmet visor.

Since Bingen formulated this typology, commentators have observed that tetradrachms of Pi V type appear in hoards dated to the 330s (hoards **2**, **14–16**), implying that this final form had probably been achieved sometime in the 340s and that the earlier developmental stages (Pi I through Pi IV) probably spanned a period of a decade or less.[14] Accordingly, once the Pi V ornament was reached, the design of the coinage remained unchanged until minting was discontinued some 40 years later, in the first decade of the 3rd century. The latest Athenian coins of Pi V type are the gold staters with Eleusis-ring symbol (Fig. 12:b, below), which are to be identified with the notorious gold coinage minted by the Athenian tyrant Lachares in 295 (see Appendix 1).

Apart from their unremitting monotony, certainly the most conspicuous characteristic of the pi tetradrachms is their hasty, slapdash minting on irregularly shaped flans, features that were assumed to reflect the mass

10. Like all of the silver owl coinages of Athens, the pi-style coinage was predominately a tetradrachm coinage, so overwhelmingly so that the smaller silver denominations may be omitted from most of the following discussion without any loss of substance. The role of these lesser denominations in the monetary history of 4th-century Athens was secondary, to the extent that it is unlikely that denominations smaller than a drachma were included in the mid-century program of mass reminting (see below, pp. 246–248).

11. Hoards listed in Appendix 2 are cited by boldface numbers. The preservation of large hoard lots of pi-style tetradrachms found outside of excavations should be regarded as exceptional. Owing to the coins' monotony and their slight interest for conventional collectors of fine Greek coins, it was common for large finds of pi-style tetradrachms to be melted down. I recall in the 1960s hearing them disparaged as "trash."

12. Bingen 1969, pp. 7–11, 18–19.

13. Bingen 1969, pp. 13–16, with attention also to two subsidiary details in the development of the coinage, the presence or (later) absence of a dot *(point tragus)* in Athena's ear, and a diminution in the rows of dots running down the breast of the owl. For a summary, see Flament 2007a, pp. 125–128.

14. Price 1993, p. 33; Flament 2007a, pp. 128–129; 2007b, pp. 98–99.

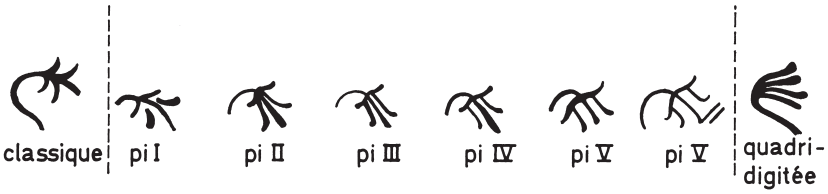


Figure 1. Phases of the pi-style helmet ornament. After Bingen 1969, p. 14, fig. 7

minting of silver that must have been required by the extraordinary productivity of the Athenian silver-mining industry under the administrations of Euboulos (355–342) and Lykourgos (338–324). But while the minting of the pi tetradrachms was certainly intensive and on a vast scale, it was no more so than during the peak years of Athenian silver minting in the 5th century, when the quality of striking generally did not suffer. Moreover, mass minting by itself is hardly sufficient to account for three anomalies of the flans on which the pi-style types were struck. First, not only are the flans commonly misshapen, but a number of them are so distorted that numismatists and coin collectors in Greece have long referred to them as "logs" *(koutsoura);* these are the tetradrachms in the form of long, stretched ovals with one or two nearly straight sides (Figs. 6:d, 8:f, g). Second, since the flans, of whatever shape, were ordinarily too small for the full relief designs of the dies, relatively few pi-style coins were minted with their entire obverse and/or reverse type showing. Third, just as the diameters and surface areas of the pi flans are generally smaller than those of Athenian tetradrachms of the 5th century (Fig. 2) and of the first half of the 4th century (Fig. 4), they tend also to be exceptionally thick. These peculiarities of the pi tetradrachms call for explanation.

Although they have always been visible—hiding, in effect, in plain sight—the two diagnostic features of the pi tetradrachms that lead to a solution have been noticed only in the past few years. The first of these is the changed position of the alpha on the coins' reverses. On all earlier owl tetradrachms (Figs. 2, 4) the ΑΘΕ ethnic begins higher, at the side of the owl's head, with the alpha's left diagonal touching the head at eye level. On the pi-style owls, the alpha is positioned below the head, its left diagonal wedged in the notch where the head meets the body,[15] thus permitting every pi-style tetradrachm to be distinguished from earlier specimens of the same denomination instantaneously.

The second feature is the unusual technique of the pi-style planchets. Unlike the customary flans of 5th- and earlier 4th-century Athenian tetradrachms that have solid, rounded edges from having been cast in a mold, pi-style tetradrachms were struck on thick planchets made of flattened, folded-over layers of silver. Robert Hoge and Peter van Alfen first identified this technique from a Pi II–type tetradrachm that was struck on a flan that appears to have been folded in half (Fig. 6:b).[16] As they recognized, the technique was devised for rapid restriking—an earlier coin was flattened with a hammer blow, and the metal was folded over and then restruck with pi types—and they suggested that this technique accounts for the peculiar shape of the above-mentioned tetradrachms in the form of distended ovals. In fact, this type of folded and sandwiched flan proves to be characteristic of apparently every pi-style tetradrachm in existence regardless of its shape;[17] and, as one sees from specimens whose edges clearly display visible seams

15. To my knowledge, this crucial detail was first noted in print by Hélène Nicolet-Pierre (2001, p. 176).

16. See van Alfen 2002a, p. 9, pl. 10:3. Another example is illustrated by Flament (2007a, p. 33, fig. 9).

17. This point was first brought to my attention by Irini Marathaki, the numismatist responsible for publishing the 2005 Agora hoard (hoard **5**).

between the sandwiched layers, the flattened earlier coins were not just folded in two but were folded over a second time (even in the case of the "logs" with the stretched elliptical shape, and probably also the coin shown in Fig. 6:b) to produce a planchet of three or four layers (see especially Figs. 6:d; 8:d, e, g; 9:b). Since the technique of these folded, restruck flans was introduced in the 4th-century tetradrachm coinage simultaneously with the lowering of the alpha on reverses, and since the earlier coins that had been flattened and folded for restriking must, by their individual weights and sheer numbers, have been Athenian tetradrachms, there is every reason to conclude that the technique was adopted for a program of intensive, mass reminting of all owl tetradrachms in Attica into new tetradrachms with the repositioned alpha.

Figure 2 *(opposite)*. **Tetradrachms of the second half of the 5th century: (a) struck on a cast flan; (b–e) exceptionally restruck on folded flans.** (a) ANS 1949.128.5 (= van Alfen 2002b, p. 65, no. 5, pl. 15), Tell el Maskhouta hoard (hoard **11**); (b) ANS 1997.9.196 (John D. Leggett Jr. bequest); (c) BM 1987-6-49-450, ex R. B. Lewis coll.; (d) *BMC* 55, Naucratis hoard (*IGCH* 1648)

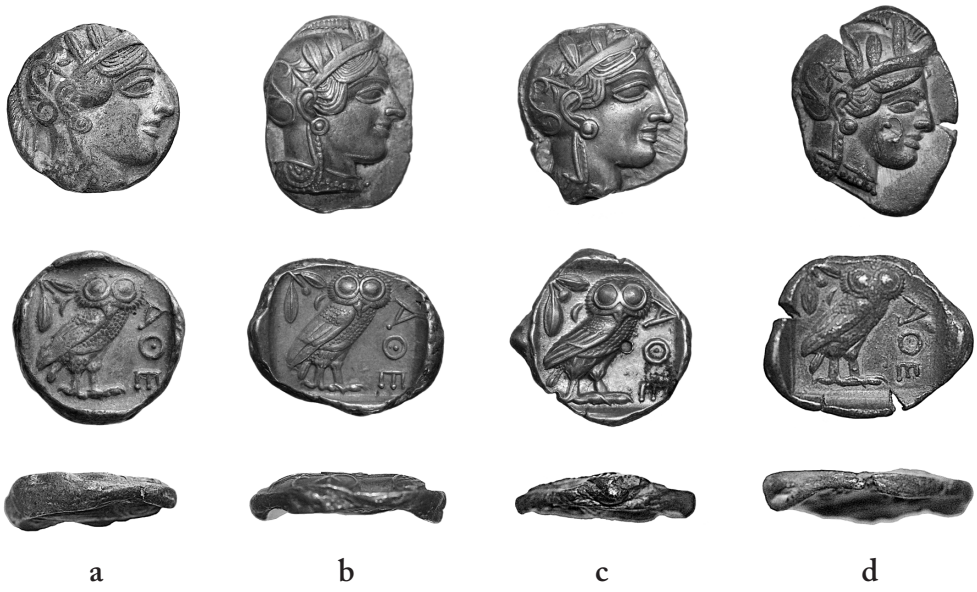
The Restriking Technique

The restriking technique itself was not new. In Figure 2:b–d, I illustrate three Athenian tetradrachms of the second half of the 5th century whose edges show traces of seams and layering similar to those of pi-style strikings. Each is irregularly shaped with one or more straight sides that further indicate that it was not minted from a round, cast planchet.[18] These tetradrachms, too, are overstrikes, and, while they could very well be remintings of older, worn owls, one cannot rule out the possibility that some or all were minted from non-Athenian coins that were equivalent in weight to Attic tetradrachms and thus were directly convertible into the latter by hammering and folding.[19] Restruck 5th-century tetradrachms like those shown in Figure 2:b–d are rare exceptions within a coinage that was predominately minted on cast flans. With the advent of the pi-style silver, however, the technique of minting on flans made of a flattened, folded disk became routine.

I am indebted to Richard E. Stone, Senior Museum Conservator Emeritus at the Metropolitan Museum of Art and a specialist in metals and metalworking, for examining a typical pi-style tetradrachm for this study and deducing how it was made. Stone proposes these four steps:

18. The coin illustrated as Fig. 2:d, from a hoard excavated in 1885 at Naucratis, has a countermark in a shallow round depression stamped over an incised letter on Athena's cheek. The small, dotlike test punch just touching the owl's breast on Fig. 2:c suggests that this tetradrachm too had probably circulated in the East. I find no good reason to suspect either of these coins of being Eastern imitations. In Fig. 2:d the orientation of the reverse die is admittedly anomalous—the top of the owl's head is at three o'clock, instead of the usual nine o'clock position—but against this one must weigh the absolute correctness of all other details.

19. Non-Athenian coins of this weight, however, were much less common than one might expect. Apart from Athens, in the second half of the 5th century only three other minting cities of Aegean Greece produced tetradrachms on the Euboeic/Attic weight standard. These are Akanthos (until 424, when it switched to the local Thraco-Macedonian standard); Mende (until 423?); and Samos (during a brief period of solidarity with Athens at the end of the Peloponnesian War, 412–404). See Figueira 1998, pp. 127–130, 138–140, 170–174, 596–598. Even so, to judge from the accounts of the Treasures of the Other Gods of 429/8 (*IG* I^3 383 = Melville Jones 1993 and 2007, no. 145), which lists 386 drachms of Akanthian silver at lines 31–32, and a missing number of Akanthian staters at lines 178–179, Akanthian tetradrachms were one of the more prominent foreign silver currencies deposited in the sacred treasuries of Attica. One can easily imagine the Athenians borrowing them from the treasuries and restriking them into Attic tetradrachms for military use in the desperate final years of the Peloponnesian War.



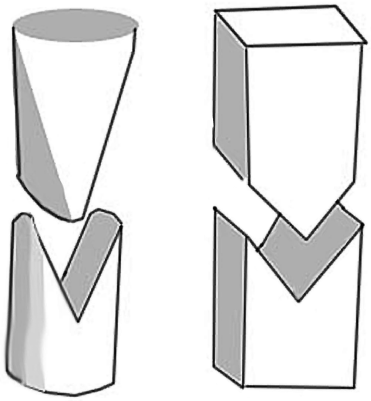


Figure 3. Punch brakes. Drawing R. E. Stone

1. The original coin was hammered flat to form a more or less regular flan—but with considerably increased diameter—and then annealed (i.e., heated in a bed of coals and then plunged into water to reduce its hardness and consequent brittleness after hammering).
2. With a punch brake (Fig. 3), the flan was bent at about a 45° angle. The flan was then hammered down to a semicircle and annealed again.
3. The process was repeated to form a quarter circle. As the original coin had been flattened, the quadrant would be flat and compact.
4. The quadrant would then be well heated and hot-struck.[20] Although the flan when placed between the dies was essentially triangular in form, the plastic flow of the very hot silver under the force of striking tended to give the struck coin a somewhat rounded shape, without necessarily eliminating residual points from the three "corners" (although note that for the tetradrachm shown in Fig. 6:c the triangular shape remained almost intact). The firmest proof of hot-striking is found in the interior of the coin. When Stone sawed the coin in two, he found no indications of layering, such as is seen at the edges; instead, the silver was fused solid.

20. In response to one of my queries about the use of heat, Stone added that "one must distinguish between annealing and hot-working. Annealing is a rapid heating followed by immediate quenching. Thus the coin was annealed after being hammered flat, probably annealed after using the punch brake so that the coin wouldn't crack at the angle when being folded flat by hammering again. (The punch brake only left the coin bent at an angle.) After this hammering it was annealed again before being quartered. Then the quartered coin was heated red-hot just before being struck—in this case, genuine hot-working. Plastic flow during striking is what obliterated the folding texture. This all sounds complicated but with division of labor, a pair of iron tongs, a hot fire, and a quenching pot of water, it can go quite rapidly."

As one sees in any batch of pi tetradrachms, there is little homogeneity in the resulting coins' shapes. And among the many, many shapes, the most curious remains the distended oval of the tetradrachm "logs." They were obviously not made like the rest from flattened coins folded in quarters. Yet the several visible layers on edges, as well as their thickness, attest that the manufacture of their planchets involved more than one folding. Stone provisionally suggests that instead of being twice bent in a ∨-shaped punch brake, the flattened disk was bent into a ∪-shape on a punch brake with a rectangular or curved section; each of the two sides of the ∪ could then have been hammered down to give a narrow planchet of three layers. Whatever the procedure, it must somehow have reduced the time and effort of flan conversion. Why else would the bizarre shape have been tolerated? One suspects that this may not have been the only experiment in speeding up the reminting process. Another variation in the production of the pi coinage was in the care expended, as the neater, rounder earlier pieces—such as that shown in Figure 5:a, with only the slightest crease on the edge that hints at layering—give way to the increasingly more imperfect ones later.

The reason why this technique of restriking was preferred to the alternative of melting all the older coins down and minting new pi ones from scratch was that by dispensing with the painstaking task of apportioning molten silver into individual molds within an acceptable weight tolerance, the process was much faster and eliminated waste.[21]

HISTORICAL CONTEXT AND EPIGRAPHICAL EVIDENCE FOR THE MASS REMINTING

The anecdotes about Hippias and the other autocratic rulers cited above provide the only ancient Greek comparanda for currency replacement by restriking and inform us that the purpose of such replacement was to raise money for the state.[22] It is impossible to know how much such a program would have raised in mid-4th-century Athens. But, as noted above, the 5th-century Athenian Coinage and Standards Decree provides evidence that Athenian silver coins were probably officially valued at 3 or 5% over the intrinsic value of silver. Whichever of the two percentages is correct,[23]

21. From their experimental attempts to replicate Athenian minting procedures, Faucher et al. (2009, pp. 53–61) emphasize that the mass fabrication of flans was by far the most challenging operation in the production sequence. They were unsuccessful in discovering a method that was entirely satisfactory in terms of achieving rapidity, tolerable accuracy in weights, and no loss of silver.

22. Recoining for fiscal gain was by no means limited to the monetary practices of ancient Greece. See Stewart 1992, p. 55: "Periodic changes of type, involving at least partial recoinage of earlier issues, are found in several parts of Europe in the feudal age. The purpose of the system cannot have been simply to keep the coinage in good order and up-to-date. The *renovatio* (or *mutatio*) *monetae,* as it was called, seems to have been designed primarily in connection with the raising of revenue." So too King Louis XIV of France arranged three recoinages in which he called in earlier coins, had them overstruck with different types, and then reissued them at a higher value (Droulers 1987).

23. Commentators such as Meiggs and Lewis (1969, p. 113) and Figueira (1998, pp. 242–244, 359–362), who interpret the percentage strictly as a fee to cover the cost of minting, favor the lower figure. Alternatively, while allowing for the possibility of the lower percentage, Melville Jones (2007, p. 69) writes that "[a] fee of five drachmas in the mina, or five per cent, seems more likely, since that would be about the same as the fee that would have been charged by a money changer for exchanging one kind of coin for another." On money changers' fees, see Bogaert (1968, pp. 325–329), who deduced that they were normally in the vicinity of 5 or 6%. But since much of the evidence for these figures derives from the

if it remained the conventional exchange rate between Athenian silver coinage and other silver—be it foreign, uncoined, or otherwise monetarily unacceptable *(adokimon)* silver—the Athenians, by demonetizing all their existing silver coinage and then recoining it anew, would have realized, before expenses, a yield of 3 or 5% of all wealth held in larger denomination cash in Attica.

Given that Athens had a state-supported mint with a salaried personnel of public slaves, the costs of the pi-style overstriking were probably less than the Delphic Amphictyony paid the mint master *(argurokopos)* Dexios for manufacturing the silver Amphictyonic coinage in 336. His compensation came to approximately 2% of the total silver coined, but would have presumably included profit for himself as the contractor in addition to covering full expenses of the operation, which, unlike the Athenian restriking, included melting down the many coinages on hand and producing flans for the new coinage from the molten silver.[24] Nevertheless, I think we can conclude that the overvaluation of Athenian coinage could hardly have been less than 3% if the city was to make any profit from the program of restriking. On the other hand, the very complexity and ambitiousness of the program suggest that its sponsors anticipated a significant profit, in which case a yield of 5% before the cost of implementation seems more plausible. The city conceivably might have issued the restruck coins with a premium slightly higher than 5%, but no more than slightly, lest people would be

exchanging of Aiginetan silver coinage for Athenian silver coinage in 4th-century Athens, and since the exchange fee *(epikatallage, agio)* had to cover both a value-added premium *and* the money changer's own profit, we are left to guess how the fee was divided between these two costs. Two exchange fees are documented in mid-4th-century building accounts from Epidauros that give totals in the Aiginetan coinage that was exchanged for Athenian coinage in order to pay for orders of Attic marble. The fee paid by the Epidaurians on the first occasion came to 5.95%; seven years later they paid a fee of 5.63%. The exchange fee that Delphic temple officials paid in 335 for conversion of Aiginetan coinage into Attic for the purchase of fine ivory at Athens came to 7.1% over the value of the coinage by weight (Melville Jones 1993 and 2007, no. 210; cf. Sosin 2000, pp. 76–80). If these fees had to cover a 5% overvaluation of the Athenian coinage vis-à-vis foreign silver, it would leave only a small fraction (in these cases a variable and probably negotiable 0.63%–2.1%) to the money changers for their services (so Mørkholm 1982, pp. 291–292; Le Rider 1989, pp. 164–165; 2001, pp. 260–263). If, on the other hand, Athenian coinage carried a premium of only 3%, the money changers would have realized a more attractive profit of 2.63%–4.1%. Looked at this way, the second alternative might seem to be the more plausible one. But in view of the several assumptions and variables on which this solution depends, it is hard to feel confident about any result that draws on these figures.

An argument sometimes cited in favor of a 5% premium begins with the fact that while the Athenian silver or coin mina was made of 100 silver drachms, in the earlier 4th century and probably for much of the 5th, the Athenian market mina *(emporike mina)* had a mass equivalent of 105 silver drachms (*Ath. Pol.* 10.2, anachronistically attributing this system to Solon), and thus weighed 5% more than the silver or monetary mina. On the assumptions that the heavier market mina system was used for the weighing of bulk silver bullion and that the lighter silver mina system was reserved for the weighing or counting out of coins, the striking of a bullion mina into a mina of coins would have resulted in a 5-drachma or 5% gain (Mørkholm 1982, pp. 291–292; Le Rider 2001, pp. 257–259; Faraguna 2006, p. 145). The first of these assumptions, however, is unsupportable. As is clear from Athenian inventories of precious-metal dedications in sanctuaries, the Athenian silver/coin weight system was used for weighing all items of gold and silver in whatever form, even bullion (Kroll 2001, p. 89). For the recording of bullion, see the list of 140+ 12-mina ingots in the Parthenon that were inventoried in 344/3 (*IG* II^2 1443, lines 16–88; with Harris 1995, pp. 123–127; Faraguna 2006, pp. 153–154). The fact that their masses are recorded, like that of all other precious-metal objects in the inventory, in drachms and hemidrachms (and not in the larger stater, mina, half-mina, etc., units of the commercial weight system) is just one indication that even raw, bulk silver was weighed according to the silver or coin weight standard. On the use of "money" or "silver" *(pros argurion)* weight standards for the weighing of precious metals generally in the Greek world, see Bresson 2000, pp. 222–242.

24. *CID* II.75 (= Melville Jones 1993 and 2007, no. 212), col. I, lines 52–55. For the calculation of approximately 2%, see Flament 2007c, p. 7.

tempted to circumvent the program by hiding their money and sending it abroad where the price for Athenian silver coins, as we are informed by Xenophon (*Vect.* 3.2), was higher than it was in Attica.

It is understandable why around the middle of the 4th century the Athenians would have resorted to this extraordinary measure. When in 355 Athens emerged from the Social War, which was itself preceded by a decade of military operations aimed at regaining Amphipolis and the Chersonnese, the city was, in George Cawkwell's words, "nearly bankrupt."[25] The continuous expenditure on warfare and the disruption of maritime trade had exhausted the city's resources and seriously reduced its revenue base. In 355 the annual revenue had fallen to 130 talents (Dem. 10.37), well below the threshold to meet state expenses. The city's magistrates, councillors, and cavalry were not being fully paid (Xen. *Vect.* 6.1), and Xenophon was moved to write his *Revenues (De Vectigalibus),* a pamphlet recommending strategies for restoring financial health to the state. Shorter-term remedies were put into effect. A commission was set up to investigate and claim any public monies that might be held in private hands (Dem. 24.11). And at the beginning of 354/3, on the motion of a certain Epikrates, an emergency legislative committee was impaneled to ensure that sufficient funds would not be lacking for the upcoming Panathenaic Festival *and* for the *dioikesis* (the financial administration of the city; Dem. 24.26–28).

Another piece of legislation proposed by this same Epikrates and passed early in the second half of 354/3 is the law partially preserved on the largely worn-away Agora inscription I 7495.[26] The law deals with several measures concerning the festival of Hephaistos and Athena Hephaistia, coinage, the mint, and the industrial processing of silver, and states in an opening clause that one of the law's purposes was to produce (more?) revenue for the *dioikesis.* Discussion of this difficult and extremely lacunose inscription must await its publication. But it is relevant here to observe that one of its more completely preserved passages is part of a series of directives concerned with the processing of silver coinage that was to be brought in by private persons. Since the activities it describes are appropriate for procedures in the mass reminting of existing coins into pi-style coins, it follows that the

25. Cawkwell 2011, p. 238 (= Cawkwell 1981, p. 54), with a fuller synopsis of the financial crisis and appraisal of the relevant sources at pp. 359–360 (= Cawkwell 1963, pp. 61–63).

26. I owe my knowledge of this inscription to the preliminary text presented in a paper by M. B. Richardson at the 1997 meeting of the American Philological Association in Chicago; to another paper of hers delivered at a colloquium at the British Museum on September 29, 2006; and to further discussions with her on textual matters in these two unpublished papers. I am grateful to her for her generosity in sharing this material and her perspectives on it with me, and to her and J. McK. Camp for permission to comment on the inscription prior to publication of the *editio princeps.*

Previous mentions of the inscription in print have noted its provision for the festival of Hephaistos and Athena Hephaistia (Faraguna 1992, p. 181, n. 33; p. 345, n. 35) and its references to silver ore, furnaces, and purified silver in a section that, according to Faraguna (2006, pp. 152–153, with reference to Xen. *Vect.* 4.49), was probably concerned in part with the state's financial interests in stages of silver refining at Laurion. The directive here translated and identified with the mass reminting thus represents a third area of legislation.

passage ought to be identified as part of the legislation that authorized and detailed the reminting program. The passage is translated as follows:

> In order that private individuals get back the minted silver as quickly as possible, let the *epistatai* compel the slaves in the mint every day to do the work [- - - - - - *gap of ca. 45–55 letter spaces, with many traces of letters* - - - - -], until those who brought in (the silver[?]) receive it back.[27]

It is probable that the large gap contained a phrase that defined what the slaves' work *(erga)* was. Hence, if the passage does indeed concern the mass reminting, the work would be "the work [of striking the silver with a new type]," or something to that effect in view of the basic *erga* of the mint *(argurokopeion),* which was of course the striking of coins.

Apart from the general appropriateness of this passage to what one imagines must have been three of the core activities of the mass pi-style overstriking—the bringing in of coins, their restriking, and the returning of coins to their owners—there are other reasons for associating this part of the inscription with the reminting program. One is the emphasis on haste and nonstop work in the mint, both readily understandable in light of the tremendous task of reminting all privately owned large-denomination silver in Attica within a finite period. Another reason is that the purpose of the reminting program and one of the stated purposes of the inscribed law were the same—namely, the raising of state revenue. Finally, the law of 354/3 and the overstriking were essentially contemporary: both belonged to the same short recovery period following the Social War. Any later than that, the expedient of reminting would have been unwarranted, for by the earlier 340s, Athens' annual revenues had begun to pick up and, according to Theopompos (*FGrH* 115 F166), by 346 they had reached a healthy level of 400 talents. Any earlier, that is, during the war years themselves, such a complex procedure for raising money would have been too cumbersome for quickly obtaining the kind of large sums necessary for sustaining effective military and naval offensives. Given their shared elements of historical context, purpose, procedure, and haste, it would take some very strong counterarguments to divorce the creation of the pi-style silver from the inscribed law of 354/3.

The translated passage above conveys a sense of the detail that the law spelled out in delineating stages of the reminting program. Tempting as it may be to attempt a hypothetical reconstruction of these stages before the publication of Agora I 7495, such a reconstruction is best postponed until the full text, however fragmentary, can provide a framework for discussing remaining components of the program.

To judge from the brief descriptions of the recoinings attributed to Hippias and Leukon, reminting programs involved more than simply the physical reminting of coins. The programs had to set a date when all existing coins would become *adokima,* obsolete pieces of silver that were no longer officially acceptable as money. Henceforth, they would be valued less, even unofficially by money changers, than their new, legally recognized, restruck counterparts. Another determination that had to be made in advance, at least as mentioned in the Hippias episode, was the

27. M. B. Richardson, trans., except for "get back" (my translation of the text's [κ]ομίζω[νται]) and my tentative interpolation of "the silver" as the object of the two verbs toward the end. I have not seen the Greek of this final phrase.

fixing of a "price" that the state would pay for the old coinage when it was brought in. Since it would be paid ultimately in the new coinage, the "price" effectively gave the rate of the exchange between the two coinages. If the rate was as suggested above, for every 100 drachms of existing coin submitted for exchange, a person would expect to receive back 95 (or 97) drachms in the new pi-style silver. This leads finally to the question of when the exchange took place: When the existing coins were brought in, before they were restruck? Or did the state take out its share after a person's old coins were restruck into new pi-style pieces? Such considerations as these need to be taken up later, once we know everything that Agora I 7495 has to reveal. There is also more to be learned from the numismatic record, to which we may now return.

FOURTH-CENTURY ATHENIAN SILVER COINAGES IN LIGHT OF THE MASS REMINTING

Earlier 4th-Century Tetradrachms (Fig. 4)

The success of the reminting program is documented by the disappearance of nearly all earlier 4th-century tetradrachms from circulation in Attica. Minting of these earlier 4th-century tetradrachms, generally thought to have begun ca. 390, continued down to the start of the pi-style coinage.[28] The Athena heads of the earlier specimens (Fig. 4:a, b), the first Athenian coins ever to depict the goddess with a fully profile eye, are distinguished by their bold features and large, heavily outlined eyes, traits inherited from the 5th-century silver. On the later, more advanced tetradrachms (Fig. 4:c–e), the rendering of the goddess's eye, nose, and mouth has become more delicate and feminine, anticipating the characteristic Athena heads of the pi-style coinage. Since the helmet ornaments on all of these earlier 4th-century tetradrachms are similar to or identical with the relatively "classical" Pi I ornament of Bingen's typology, the latest pre-pi specimens are distinguishable from early pi-style tetradrachms only by the traditional position of the alpha in their reverse legends.

Overall, these earlier 4th-century tetradrachms survive in comparatively modest numbers. To date, only two specimens are known to have been found in Attica.[29] All the rest with recorded proveniences come from 4th-century hoards in Sicily and Egypt (hoards **10–13**) and, to a much lesser extent, the Levant and Mesopotamia (hoards **14–17**). By way of contrast, in large, late hoards of pi-style tetradrachms from Attica, like the 262-piece hoard from Thorikos and the larger find from the Piraeus (hoards **3**, **4**), tetradrachms of pre-pi type are conspicuous by their absence.

Traditionally, the paucity of these tetradrachms has been regarded as evidence for a very low level of silver production in the Laurion mines during the first half of the 4th century. But was the coinage really so slight? The stylistic range of the 19 earlier 4th-century tetradrachms in the 1957 Lentini hoard in Sicily (hoard **10**), together with the fact that nearly all of these tetradrachms were struck from different obverse dies, suggests that the pre-pi silver of Athens was quite significant in size. More importantly, if all such tetradrachms in Attica were demonetized and converted into

28. On this largely understudied coinage, see Kraay 1976, p. 74, pl. 11:200; *Agora* XXVI, p. 8; Kroll 2006; Flament 2007a, pp. 121–122; 2007b, pls. 2, 3; Kroll, forthcoming.

29. Agora coins N 12175 (Fig. 4:a) and N 74094. The first was recovered in 1997 in the dismantling of a wall, and has been recleaned since an earlier photograph was published in Kroll 2006, pl. 3:4. The second tetradrachm was found during the cleaning of the first 130 coins of the 2005 Agora hoard (hoard **5**). Both of these coins attest that, as one might expect, some tetradrachms in Attica did escape the reminting of 353. N 12175 could have been lost prior to the reminting.

Figure 4. Earlier 4th-century tetradrachms (all struck on cast flans): (a) Athenian Agora; (b–e) from the Lentini (Sicily) 1957 hoard (hoard 10). (a) Agora N 12175, photos courtesy Agora Excavations; (b) ANS 1959.137.1; (c) ANS 1959.137.4; (d) ANS 1959.137.2; (e) ANS 1959.137.3

pi-style pieces in the late 350s, most of the evidence for the scale of this coinage would have been wiped out. Knowledge of this tetradrachm coinage depends almost entirely on specimens that had escaped, having been exported from Attica prior to the reminting.

Writing in 355, Xenophon (*Vect.* 4.28) observed that exploration for productive new mines was extremely limited in comparison with such activity in the 5th century, and had been undertaken again "only recently." When taken together with the modest numismatic evidence for Athenian coining in the first half of the century, Xenophon's statement has been understood to imply that Athens' silver industry was still recovering from the disruptions of the Peloponnesian War.[30] However, Xenophon's concern about the low level of exploratory activity pertained only to risky prospecting for new mine cuttings; the old mines were apparently still operational. When read in its entirety, Xenophon's analysis of the industry in 355 suggests that it had been functioning quite successfully, even under the constraints of a shortage of labor (*Vect.* 4.5). His point rather was that there was plenty of opportunity for expansion that would allow the industry to return to its full, 5th-century potential.

Pi-Style Tetradrachms

The Initial, Reminting Stage of the Coinage: Bingen Classes Pi I–IV (Figs. 5, 6, 8), and Possibly Early Pi V (Fig. 9:a, b)

The exchange and reminting of Athenian silver in the late 350s was a tremendous undertaking, involving the striking of early pi-style tetradrachms not only on a colossal scale but also with all possible haste, so that no one would be kept waiting to have his demonetized tetradrachms converted into tetradrachms he could use. Since the success of the conversion depended on efficiency and speed, we are justified, I think, in assuming that the task was probably completed if not within weeks, then at least within a matter of months and almost certainly in less than a year's time. However

30. E.g., *Agora* XXVI, p. 8; and van Alfen 2000, p. 21, characterizing the first half of the 4th century as "a period of near inactivity of the mines."

Figure 5. Pi I tetradrachms (all struck on folded flans). (a) ANS 1944.100.24245 (E. T. Newell bequest); (b) ANS 1944.100.24312 (E. T. Newell bequest); (c) *BMC* 145; (d) *BMC* 146

compact, the short span of the mass reminting has important ramifications for reconstructing the chronology of the pi-style coinage as a whole. If, as I have argued, the law of Agora I 7495 authorized this program of mass reminting, the voting of the law on the seventh day in the sixth prytany of 354/3 (i.e., in late December of 354 or early January of 353)[31] implies that the implementation of the program belongs to the year 353.

Beginning with the Pi I tetradrachms of Bingen's typology, the mass reminting stage of the coinage apparently continued at least through the Pi II, III, and IV classes since these classes contain a cluster of the tetradrachms with the elongated oval flans, coins that owe their distended shape to experimentation in speeding up the restriking process (Figs. 6:d; 8:f, g).[32] The expedient was not conceived of at the outset when the pi-style minting was just getting under way, and care was taken to manufacture a fine new coinage such as the city was used to. It appears first in the Pi II phase of the coinage and attests to the unanticipated realities of the mass reminting program as the mint apparently became overwhelmed with a growing backlog of coins that had to be processed ever more quickly. Under pressure, control of quality gave way to intensification of output. Although the elongated oval shape is only the most exaggerated of the plethora of irregular shapes that these folded flans took beginning with the Pi II phase of the coinage, the importance of the shape for us is that it associates Bingen's classes II through IV with the concentrated mass reminting and hence dates them, along with class I (and possibly also early class V; see below, pp. 243–244), within the year 353.

As noted, the obverse helmet ornaments of the Pi I tetradrachms continue the ornament of the earlier 4th-century tetradrachms. In fact, it is likely that the Pi I obverse dies were dies that had originally been engraved and used for the striking of pre-pi tetradrachms. There was no reason why existing obverse dies should not have continued in service: since the distinguishing hallmark of the new acceptable coinage was the lowered alpha on the coins' reverses, only new reverse dies had to be engraved. To judge from the round coin shown in Figure 5:a, with its folded flan betrayed

31. For these calendric determinations I am indebted to M. B. Richardson.

32. Owing to the narrow widths of the coins and their rushed striking generally, the obverse helmet ornament of many of these elongated tetradrachms is often struck off the flan, making it difficult to classify particular specimens. Nevertheless, the five elongated tetradrachms in the Delos 1910 hoard (hoard **1**) must date with all of the other Pi II and III pieces in the hoard. The seven in the Syria 1989 hoard (hoard **14**) were classified by van Alfen (2002a, p. 11) as Pi III/IV. Those in the Thorikos 1969 hoard (hoard **3**) were classified as Pi III (Bingen 1969, nos. 25, 28) and Pi IV (nos. 55, 56, 58, 81). (Bingen's nos. 92 [reverse] and 117 are not classifiable.) The clearest specimen of an elongated Pi II tetradrachm known to me is the one illustrated in Fig. 6:d.

Figure 6. Pi II tetradrachms (folded flans). (a) ANS 1968.34.36 (ex Burton Berry coll., *SNG* no. 694); (b) Robert Hoge coll., New York, photo J. H. Kroll; (c) ANS 2006.12.169, Near East Hoard (hoard **15**); (d) ANS 1944.100.24306 (E. T. Newell bequest), Attica/Piraeus hoard (hoard **4**)

Figure 7. Counterfeit Pi I tetradrachm of silver-plated bronze from the Athenian Agora. Agora H-1935. Photos courtesy Agora Excavations

by only a fine seam on the edge, considerable care was taken at the outset to ensure that the pi-style coins would not appear inferior to the earlier 4th-century tetradrachms that they replaced. Its exceptionality suggests, however, that such care was not maintained for long.[33]

As the restriking program continued to be hurried along, the elongated oval shape made its appearance among tetradrachms with Pi II obverses. This planchet shape is concentrated especially among the Pi III and IV tetradrachms, suggesting that, if the shape happened to have belonged to a single episode in the production history of the coinage, the striking of Pi II, III, and IV tetradrachms must have overlapped to a considerable degree. That is to say, while the evolving helmet ornament implies that obverse dies by and large were prepared in the linear Bingen sequence, once any newly engraved obverse die was introduced into the pool of active, striking dies, it would have been used for a while alongside obverse dies with earlier ornament types. A study of the pi tetradrachms by obverse and reverse dies would go far to clarify the degree to which obverses with these different phases of helmet ornaments may have been in use simultaneously.

Whether the initial, reminting stage of the coinage was limited to Bingen's Pi I–IV classes, or continued to include early specimens of Pi V, is impossible to say. There exist occasional Pi V tetradrachms that have the

33. The photograph of the reverse of one of the Pi I tetradrachms in the Thorikos hoard (Bingen 1969, fig. 12, no. 7) shows a gaping seam between two folded layers.

The pivotal place of the Pi I tetradrachms in the monetary history of 4th-century Athens gives meaning to the curious group of 13 freshly minted subaerate Pi I tetradrachms found in pockets of 4th-century fill close to the center of the Athenian Agora square in 1933 (*Agora* XXVI, pp. 9, 20, nos. 16a–16m, pl. 2, illustrated with photographs of plaster casts). Figure 7 illustrates one of these silver-plated counterfeits (no. 16d). All struck from the same pair of dies, they are evidently the remnant of a large hoard of such forgeries, hidden away presumably to escape detection. Now that we can date them to 353, when traditional tetradrachms were no longer acceptable and had to be exchanged for tetradrachms with the lowered alpha, it appears that forgers created these counterfeits specifically to take advantage of the confusion and uncertainty that would have accompanied this change of currency, especially early on when demand for tetradrachms with the lowered alpha would have been especially high.

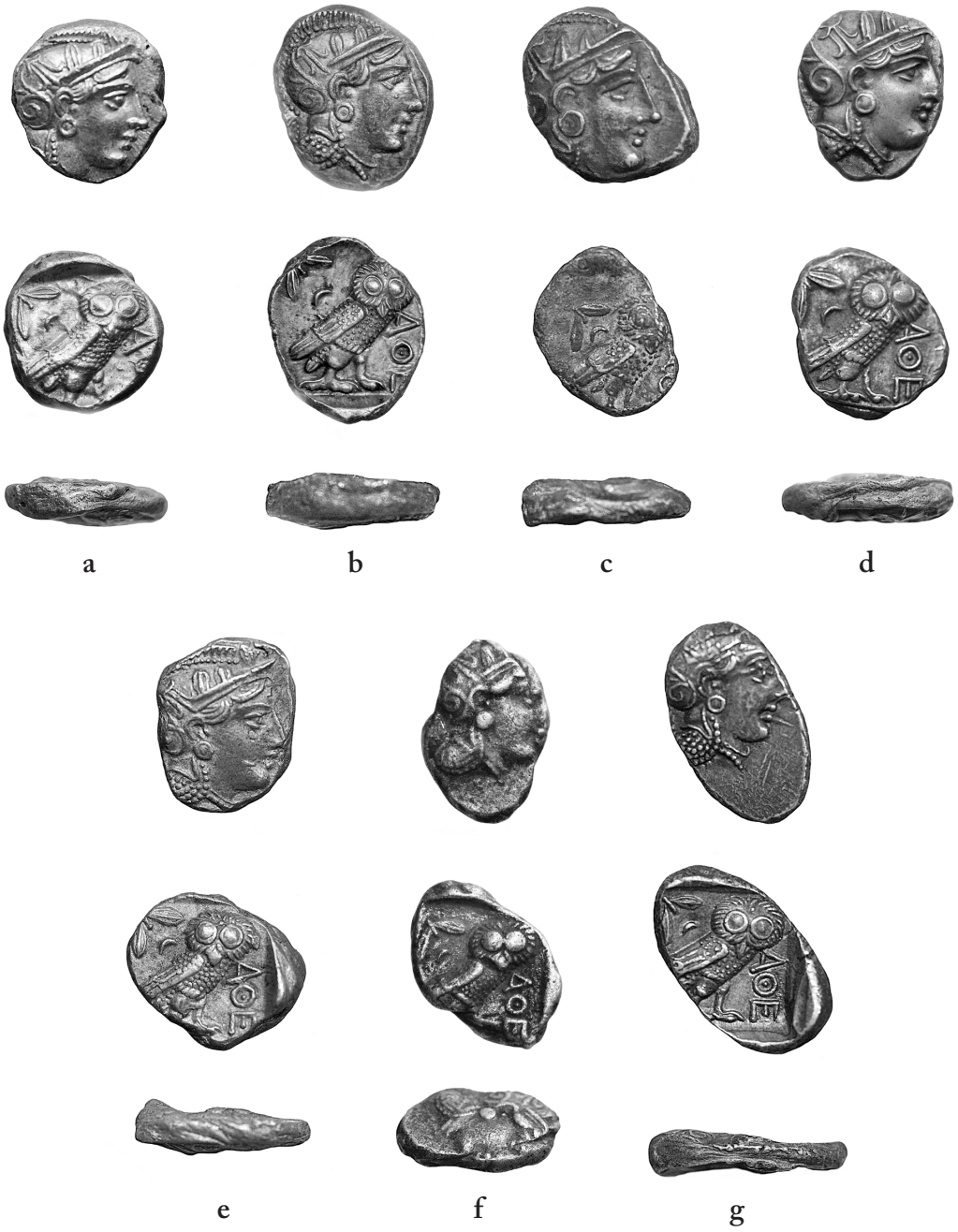


Figure 8. Pi III and IV tetradrachms (folded flans). (a) ANS 1944.100.24308 (E. T. Newell bequest), Attica/Piraeus hoard (hoard **4**); (b) BM 1925-1-14-1, from Egyptian hoard; slight cut mark just below and to the right of the eye; (c) *BMC* 134; (d) ANS 1944.100.24405 (E. T. Newell bequest); (e) BM 1925-1-14-2, from Egyptian hoard; cut mark below eye; (f) ANS 2006.12.286, Near East hoard (hoard **15**); (g) *BMC* 136

elongated oval shape (Fig. 9:a),[34] but while planchets of this shape might be an indication of chronological proximity to the Pi II–IV grouping, they never completely died out and were employed, not uncommonly, for the overstriking of worn coins of smaller denominations during the long Pi V period (see Fig. 11:b, d, f, and g, below, although these were apparently struck on flattened earlier pieces that had been folded in two). Again, only a full-scale die study could reveal where in the striking history of the Pi V tetradrachms these relatively few pieces of oval shape belong.

34. See also Bingen 1969, p. 12, no. 145, fig. 3.

Figure 9. Pi V tetradrachms (folded flans). (a) ANS 1957.172.1139 (Hoyt Miller bequest); (b) *BMC* 138; (c) ANS 2008.15.125, Near East hoard (hoard **15**); (d) *BMC* 132; (e) *BMC* 135

The Second, Protracted Stage of the Pi-Style Coinage: Most If Not All of Bingen Class V (Fig. 9)

Once the restriking of the older coinage was complete, the mint was able to return to its normal business of minting fresh silver from the Laurion mines. Beginning already in the late 350s and continuing down into the 290s, this second phase of pi-style minting was not only as lengthy as the initial stage was compressed, but its production was probably more voluminous; during Athens' great era of economic prosperity under the fiscal management of Euboulos and Lykourgos, the Attic mining industry thrived as it had not since the 5th century.[35] The coinage over this whole period was Pi V coinage with the fully developed square pi ornament on the obverse helmet. As the late, large hoards of pi-style tetradrachms—e.g., Thorikos and Piraeus (hoards **3**, **4**)—demonstrate, the coinage was huge and carelessly struck. Flans were still irregular in shape because they continued to be made with the same technique of folding over layers of flattened disks of silver. Originally devised for the reminting of earlier Athenian coins, the technique, with its conspicuous seams on a coin's edge, was employed for all subsequent pi-style coins, even those that must have been minted directly from bullion. Once this layered technique had become an identifying characteristic of true Athenian tetradrachms, it, like the lowered alpha, could not be changed. Indeed, the lowered alpha and the layered technique

35. As fragmentary as they are, the inscribed 4th-century Poletai lists continue down to the end of the century, making it certain that the mines remained active until that time. As indicated by the clustering of nearly all of the longer lists (two to four columns of text) in the 340s, the working of the mines was especially intense during that decade (Langdon 1991, p. 62). In an exhaustive analysis of the literary and epigraphical sources pertaining to Athens' silver industry in the later 4th century, Faraguna (1992, pp. 289–322) emphasizes that despite a short period of difficulty around 330, the industry remained an important part of the public and private economy of Athens in the 320s and to the end of the century.

Figure 10. Third-century tetradrachms (folded flans): (a) *quadridigité* type, 280s; (b) heterogeneous type, third quarter of 3rd century. (a) ANS 1944.100.24566 (E. T. Newell bequest), Thessaly hoard (*IGCH* 168); (b) BM 1926-1-16-81

of the planchets continued in use even with the owl tetradrachms of the 3rd century: the *quadridigité* tetradrachms of the 280s (Fig. 10:a) and the so-called heterogeneous tetradrachms of the third quarter of the century (Fig. 10:b).[36]

Smaller Denominations (Fig. 11)

Along with tetradrachms (theoretical weight 17.28 g), Athens minted in smaller denominations ranging in size from the drachm (4.32 g) and the obol (0.72 g) down to fractions of the obol, the most common, at least in the 4th century, being the tritemorion (¾ obol, 0.54 g), and the hemiobol (0.36 g). Inasmuch as nearly everything that can be deduced about the mass reminting of 353 pertains to tetradrachms, one is left to ask to what extent might any of these other denominations have been involved. Were they not also subject to eventual demonetization and expected to be turned in for restriking? One might assume so on the grounds that any legislation that authorized the demonetization and reminting of silver coins should theoretically have included all silver coins.[37] On the other hand, since the purpose of the program was to earn revenue for the state, it would have made little sense to treat all denominations equally, inasmuch as the effort to convert huge numbers of small fractions would hardly justify the miniscule return on each piece—if indeed it would not have created a loss—and would have interfered with the profitable conversion of tetradrachms.

Three of the fractional denominations—drachms, obols, and hemiobols—have the same reverse owl type as tetradrachms, including, during the pi-style era, the lowered alpha. Since people would be reluctant to accept any silver coins with the older, higher position of the alpha, it stands to reason that all pre-pi specimens of these three denominations ought to have been exchanged and restruck early on. As shown by a drachm with a typical Pi II helmet ornament (Fig. 11:a), the exchange of old drachms for new did begin early in the mass restriking program. Drachms were the fundamental unit of the denominational system and were large enough to be restruck without difficulty. Besides, they would have been needed to supplement pi-style tetradrachms in order to make up sums of less than four

36. On these 3rd-century owl coinages, see Nicolet-Pierre and Kroll 1990; *Agora* XXVI, pp. 10–13; Kroll 2002, pp. 209–211.

37. There is to my knowledge no hint of any denominational terminology in the surviving lines and words of Agora I 7495. Coins are referred to as "silver" or "minted silver," as in the translated passage above (p. 239).

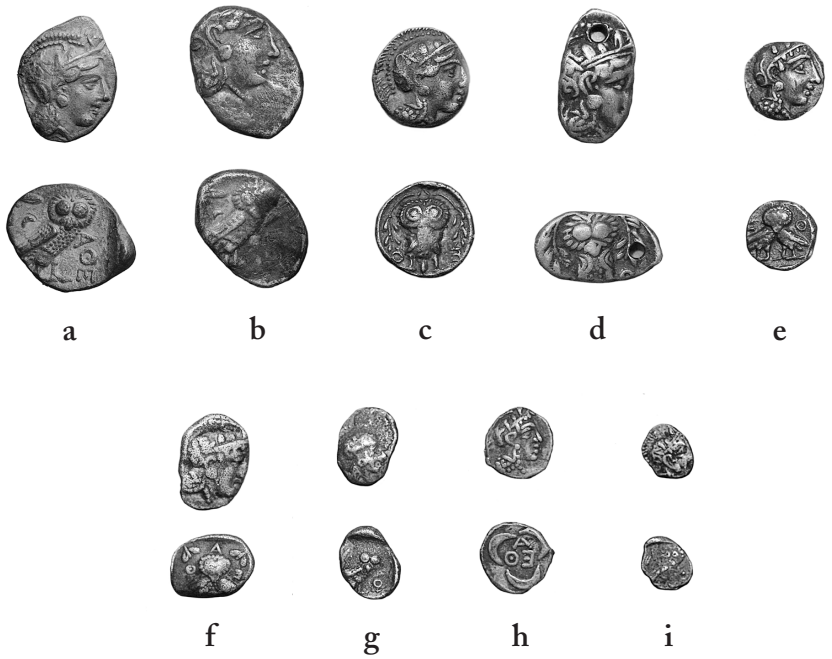


Figure 11. Fourth-century silver fractions. ***Drachms:*** **(a) Pi II; (b) Pi V.** ***Triobols:*** **(c) earlier 4th century; (d) Pi V.** ***Diobols:*** **(e) earlier 4th century; (f) pi-style.** ***Obol:*** **(g) pi-style.** ***Tritemorion:*** **(h).** ***Hemiobol:*** **(i) pi-style.** (a) ANS 1944.100.24337 (E. T. Newell bequest); (b) BM 1949-4-11-486; (c) BM 1920-8-5-324; (d) *BMC* 167; (e) *BMC* 179; (f) BM 1949-4-11-491; (g) BM 1949-4-11-489; (h) BM 1949-4-11-464; (i) *BMC* 121

drachms in the exchange between them and the old *adokima* tetradrachms. On the other hand, it is impossible to say whether pi-style obols and hemiobols with lowered alphas (Fig. 11:g, i) were given this same priority. In the publications and several collections that I have consulted, I have found none with a clearly classifiable Pi I–V helmet ornament. Although this results largely from the coins' small size and imperfect die-cutting and preservation, there needs to be more study of the pi-style obols and hemiobols before they can be placed in the pi-style minting sequence.

The three remaining fractional denominations present an entirely different picture. Triobols, with the reverse type of an upright, facing owl (Fig. 11:c, d); diobols, with a double-bodied owl reverse (Fig. 11:e, f); and the three-quarter obol with three lunar crescents on the reverse (Fig. 11:h)—all have a triangular arrangement of the AΘE ethnic. During the pi-style era, moreover, their reverse types and ethnics remained unaltered, meaning that it was never possible to distinguish examples of these fractions that were minted after 353 from earlier 4th-century specimens simply by looking for some changed detail on their reverses. Given the unchanged reverses of these fractions, it appears that the planners of the pi-style reminting did not consider it worth the effort to include these smaller monetary units in the demonetization and reminting program.[38]

38. Pi-style versions of most of these denominations with triangular ethnics were minted, but apparently only or mainly during the long, final Pi V phase of the coinage, after the mass reminting phase was over. All pi-style triobols known to me with clearly visible helmet ornaments have Pi V ornaments or an abbreviated version thereof; given their poor die-cutting and sloppy striking, which are exceptionally careless even by Pi V standards, all are recognizably late. See, especially, Thompson 1957, pls. 2, 3. In contrast to the compact, neatly rendered, facing owls on the reverses of the earlier 4th-century triobols, the owls on the especially common Pi V triobols are larger, cruder, and more heavily fringed, and have the wild, frenetic aspect of many of the tetradrachm owls.

A fair number of the late (i.e., Pi V) fractions in the Kaki Thalassa and Piraeus 1956 hoards (hoards **8**, **9**) were overstruck on the flattened and folded-over silver of earlier specimens. Some of these Pi V overstrikes have the resulting shape of elongated ovals; on others one can see overlapping edges of the flattened and folded planchet. Far from being a part of the early mass reminting of the later 350s, however, the overstriking in these later instances was almost certainly for the purpose of converting worn old coins into fresh new ones; see Picard 1969, p. 829.

Inattention to the smaller denominations in 353 is reflected in the mixed character of hoards of fractions that were buried in the second half of the century. The earliest was found along the southern coast of Attica at Anavyssos (hoard **7**). Its single elongated Pi II or III tetradrachm and several pi-style obols and hemiobols with the lowered reverse alpha attest that the hoard was buried relatively early in the pi-style era; yet nearly all of the other pieces, at least 50 drachms and fractions from triobols to hemiobols, date from before the introduction of the pi-style coinage. Whether this was a savings hoard accumulated piece by piece over a long period, or a burial of currency in circulation, its old drachms and smaller denominations had clearly not been subject to recall and restriking. A number of worn pre-pi fractions occur also among the many triobols in the later Kaki Thalassa and Piraeus 1956 hoards (hoards **8**, **9**). Such evidence suggests that whatever the authorizing legislation for the mass reminting may have originally mandated for silver coinage in general, it was probably not enforced with respect to denominations smaller than a drachm. Out of pure practicality, denominations smaller than this were either excluded or neglected. The state made its profit from restriking pre-pi tetradrachms, which, as the find documentation from Attica makes clear, did not survive the reminting program of 353.

CONCLUSION

The program of reminting outlined on the preceding pages accounts for changes in the physical appearance and fabrication of Athenian tetradrachms that occurred near the middle of the 4th century along with the disappearance of earlier tetradrachms from circulation. Cumulatively, these changes resulted in one of the more dramatic transformations in the long history of Athenian silver coinage. From a coinage that was generally well struck on round flans and was altogether conventional in its overall appearance, suddenly in 353 the coinage took on a slipshod and rushed character, with hardly any consistency in the varied shapes of its flans, which were generally too small for the die images that were stamped on them, often with little effort made to center the image on the flan. By normal Greek numismatic standards, this coinage of the second half of the 4th century was an unsightly coinage, a coinage of erratically shaped pieces of silver bearing usually only parts of its unmistakable Athena/owl types: Athenian coinage stripped to its barest essentials.

To judge from the unrelenting outflow of these tetradrachms to Egypt and the Near East during the third quarter of the 4th century, the precipitous decline in the quality of the coins' appearance made not the slightest dent in the insatiable international demand for them. Once the Athenians themselves became accustomed to the new look of the coinage, one suspects that they could appreciate the irony that these most unattractive of all contemporary Greek coins were also the most highly sought-after coins in the Aegean and eastern Mediterranean world—at least until they had to compete in the East with the silver of Alexander. Even then, as Zeno famously observed, for all the carelessness and crudeness of Athenian

tetradrachms, they remained no less valuable than the highly artistic and impeccably struck Alexanders (Diog. Laert. 7.18).

What we are now able to add to this narrative is that this irregularly struck coinage commenced not with the expansion of Athens' silver mining industry under the administration of Euboulos, but with an independent, short-term revenue scheme that preceded this expansion and employed not new silver from the mines but old Athenian silver that was already in circulation. It was an exceptional scheme, belonging to an exceptional historical moment when Athens was struggling to make ends meet and when a new kind of political leadership was coming to the fore that placed a premium on creative economic and fiscal thinking, such as is found in the recommendations of Xenophon's *De Vectigalibus* and in the initiatives of Euboulos.[39] It was out of this inventive intellectual milieu that the program of mass recoining emerged. Not that the idea of raising money by changing the coinage was original; if there is a germ of historical truth in any of the anecdotal accounts of Hippias, Dionysios, and Leukon, it was certainly not. But in 4th-century Athens it was one potential source of revenue that remained to be tried, and, as with many untried revenue schemes, it was probably not difficult to make a persuasive theoretical case in its favor.[40]

In policy terms, the scheme was a kind of excise tax on each and every piece of large-denomination currency in Attica through the exchange (i.e., selling) of a newly struck, exclusively acceptable *(dokimon)* coinage for the devalued, unacceptable *(adokimon)* existing coinage at a conventional exchange rate between these two legally distinct currencies. Since the program taxed the rich and people of ordinary means progressively, each person in proportion to his assets in cash, one can understand why the program would have been politically attractive to democratic lawmakers. For a one-off tax, the program had clear advantages. There was no need for compiling records of people's taxable assets. Nor did the state need to consider penalties for noncompliance. Once it was declared that all existing large denomination coinage would become invalid, it was in everyone's interest to come forward to exchange whatever tetradrachms and drachms they had at the best rate the state would offer. Besides the permanent citizen and metic population of Attica, all foreign merchants, ship captains, sailors, travelers, and other visitors were subject to the tax as well. The one group that was not liable was the poor, whose slight cash on hand would have been in the form of the petty change that was effectively exempted.

The main hurdle lay in the complexity of the program's implementation—of having to manage the exchanging and recoining of a vast quantity of silver within a very narrow frame of time. To judge from the outcome, those responsible for planning the program greatly underestimated the physical demands required by the intensive recoining. The relatively careful restriking of Pi I tetradrachms at the outset implies that the new, pi-style overstrikes were supposed to be as regular in appearance as the coins that preceded them. But as it soon became clear that the restriking had to be desperately accelerated, operations were simplified, giving the new coinage an uncouth and haphazard look. Irregularity in manufacture was nothing new in the long history of Athenian silver coinage, as shown, for example, by the restruck 5th-century tetradrachms illustrated in Fig. 2:b–d. But as

39. Cawkwell 2011, pp. 358–364 (= Cawkwell 1963, pp. 61–65); Ober 2008, pp. 249–253.

40. At *Eccl.* 812–829, Aristophanes mocks the Athenians' propensity to embrace novel proposals for enriching the state, only to feel cheated when the enacted proposal falls short or otherwise proves to be a fiasco. He refers to an abortive salt tax, the use of a bronze currency, and a failed 2½% tax championed by a certain Heurippides.

we see from the well-struck earlier 4th-century tetradrachms shown in Figure 4, it was new in the 4th century; and one has to wonder how the populace reacted when it became clear that nothing could be done about it once the program of exchange and mass reminting had gotten under way. The purpose of the program was, after all, to raise money for the state, and if this resulted in a deplorable unintended circumstance—namely, a new Athenian coinage of radically substandard appearance—that was a compromise that had to be accepted, and, once accepted, perpetuated.

We can look forward to learning more about the restriking program as further documentation becomes available. Once the 385 pi-style tetradrachms of the Agora 2005 hoard (hoard **5**) have been individually cleaned for study, a large, new body of material will become available for comparison with the Thorikos and other late finds of pi-style tetradrachms in Attica. Most essential, however, will be the long-awaited publication of Agora inscription I 7495.

APPENDIX 1
DATING THE PI-STYLE GOLD

The identification of the Athenian Pi V coins in gold (Fig. 12) with the gold coins that the Athenian general and tyrant Lachares is known to have minted from dedications on the Athenian Acropolis in the early 3rd century has, for several generations now, provided a canonical fixed point in the numismatic chronology of Early Hellenistic Athens. Lachares was famously remembered right after the fact (Kassel-Austin, *PCG* 5, pp. 11–12 = Ath. 9.405–406) as well as by posterity (Plut. *Mor.* 379c; Paus. 1.25.7, cf. 19.16) for having "stripped Athena naked" by removing the gold sheathing from the dress of the statue of Athena Parthenos and melting other dedications on the Acropolis to pay his mercenary troops during Demetrios Poliorcetes' siege of Athens in the spring of 295 (*POxy.* no. 2083 = *FGrH* 257a, fr. 4).

In his seminal 1898 paper on the gold coinages of Athens, Ulrich Koehler observed that the identification of the extant pi-style gold with this gold coinage of Lachares is complicated by the fact that the gold was struck in two varieties, one represented by a small group of (now) three staters without any adjunct symbol on the reverse (Sv. 21.7 [Berlin]; Bingen 1969, p. 24, no. 6 [Thorikos hoard]; and ANS 1967.152.274 [Fig. 12:a]),[41] the other by the more numerous pi-style staters, quarter-staters, and twelfths whose reverses display a symbol that in the numismatic literature had been conventionally called a *kalathos* (basket) (Sv. 21.1–6, 8–22, with ANS 1959.254.19 [Fig. 12:b]).[42] Faced with two issues of gold coins, Koehler proposed two historical occasions for their minting, one being the well-documented gold coining of Lachares during the siege of Athens in the mid-290s, the other a possible but otherwise unattested minting of gold in 339–338 by the Athenians during their all-out preparation for war with Philip at Chaironeia. Koehler admitted uncertainty as to which issue of gold went with which occasion, but this concern disappeared from the literature as subsequent scholars preferred to regard all of the pi-style gold in terms of a single historical episode. While Barkley Head preferred Koehler's pre-Chaironeia hypothesis,[43] all other commentators, beginning with W. S. Ferguson, J. N. Svoronos, and E. T. Newell, have so emphatically and consistently endorsed the identification with the notorious minting of Acropolis gold by Lachares that this identification may be said to have achieved the status of numismatic orthodoxy.[44]

41. All three were struck from the same reverse die, which was partially caked with rust. The Thorikos and ANS staters are both from the same obverse die; the obverse of the Berlin stater attests to a second die.

42. With regard to the dies, Margaret Thompson (1961, p. 421, n. 2) wrote: "It is difficult to make die comparisons from Svoronos' illustrations of seventeen staters of the Lachares issue, but I believe that at least 6 obverse and 11 reverse dies are represented on his pl. 21." From these one must subtract the pair of dies of the Berlin stater without symbol.

43. Head 1911, p. 375.

44. Ferguson 1911, pp. 133–134; Svoronos 1927, pp. 159–168; Newell 1927, pp. 133–134, n. 4.

a b

Figure 12. Pi V gold staters: (a) without symbol; (b) with Eleusis-ring symbol. (a) ANS 1967.152.274; (b) ANS 1959.254.19. Photos courtesy American Numismatic Society

Very recently, however, Christof Flament has proposed an entirely novel interpretation of the gold, one that links it neither to Lachares nor Chaironeia nor any other military emergency.[45] He argues as follows:

(a) According to Polyaenus (*Strat.* 3.7.1), when Lachares was fleeing on horseback to Thebes, he scattered gold darics on the ground to slow his pursuers. Since "daric" was a term that was popularly used to describe the gold staters of Philip, and since in the early 3rd century mercenary soldiers might have preferred to be paid in an established international coinage, the gold coins that Lachares is said to have minted to pay his mercenaries were probably in the form of staters either of Philip or of Alexander.

(b) It is not necessary to assume that Athens' pi-style gold must have been struck, like Athens' earlier gold coinage of 407/6, at a time of military urgency.

(c) Inasmuch as the pi-style gold was struck in multiple issues (Flament recognizes not two but three separate varieties) and hence at discrete intervals, it could hardly pertain to a single historical episode.

(d) Since the issue-symbol of two of these emissions was a *kalathos,* or wool basket, the gold was probably issued periodically in connection with the Panathenaic Festival, which involved the presentation of a woolen robe to Athena that had been ceremonially woven by young girls of the city.

(e) The connection with the goddess is indicated further by the coin dies listed in varying numbers in variously dated inventories (from 398/7 to 319/8) of dedications stored in the Parthenon and elsewhere on the Acropolis. Such dies, like the ones listed in the inventories of 371 and 368, were, according to Flament, removed every four years for striking gold issues for the Panathenaic Festival.

For all of its originality, it does not require much scrutiny to recognize that this interpretation is untenable. The first four of the above contentions involve errors of omission, judgment, or fact, while the last is too hypothetical to carry any argumentative weight. I take them up in reverse order.

If one thing is clear from Flament's 2004 paper on the coin dies listed in the Acropolis inventories, it is that there is no way of ascertaining for what coinage or coinages any of these dies had been used. To take the best-known example, the dies listed in the inventory of 398/7 may or may not have been employed for the gold coinage of 407/6; their (widely accepted) connection with a gold coinage rests on attractive but extensive and unverifiable restorations in the text. As for the dies inventoried on the Acropolis in other years, including 371 and 368, there is even less to draw on.

Although old publications called the adjunct symbol that appears on most reverses of the pi-style gold a *kalathos,* J. D. Beazley explained that the object was in fact the metal ring that initiates in the Eleusinian Mysteries used to clasp together the boughs of their mystic staff.[46] Referred to now as a "bakchos-ring" or an "Eleusis-ring," it first appears as the reverse type

45. Flament 2007a, pp. 130–132; 2007b, pp. 100–105.

46. Beazley 1941.

of the tiny 4th-century silver ⅜ obols of the first half of the 4th century (Sv. 22.29–43) and is commonly depicted later on Athenian bronze coins associated with the Mysteries but also as a generic Athenian symbol on coins without any explicitly Eleusinian association.[47] One can only guess why this symbol appears on most of the pi-style gold since it is unlikely that the coins had any connection with dedications or festivals of Eleusis. It was probably selected as a conventional Athenian symbol for the purpose of distinguishing the second issue of pi-style gold from the earlier one, which lacked a symbol. It has, in any event, nothing to do with the Panathenaia.

Following Bingen,[48] Flament takes as his third series the gold staters that for more than a century have been recognized as modern forgeries.[49] The forgeries are betrayed by the row of beaded dots that unnaturally line the bizarre S-shaped configuration of Athena's ear and by the thick, swelling leaves of the lotuslike helmet ornament in a distortion of the linear tendrils of genuine pi-style prototypes. In fact, there are only two known varieties of genuine pi-style staters, and while they may very well reflect two episodes of minting, they are hardly congruent with a program of periodic festival minting.

The principle that the Athenians minted gold only at a time of dire military need is documented by the 407/6 gold, by the literary testimonia pertaining to Lachares, and by the New Style gold staters with the names of King Mithradates and Aristion that were struck during or in preparation for Sulla's siege of Athens in 87/6 (Sv. 71. 1–4, all from the same pair of dies). There are no documented exceptions to the principle, and for good reason: Athens stored its wealth in gold in objects dedicated to the gods, which meant that the metal could only be "borrowed" from the city's gods and that in order to convert it into coin, these sacred gifts had to be destroyed. Such acts would not have been contemplated under any but the most desperate circumstances, when the city's available reserves of silver were inadequate to cope with a military emergency.[50]

As J. R. Melville Jones explained in his 1979 paper entitled "Darics at Delphi," by the middle of the 4th century, "daric" had become a general term that was commonly used to describe any gold coin. Just as it was applied to Attic-weight gold staters of Philip, it was a perfectly natural term for describing the gold pi-style staters of the same size and weight that were scattered by the escaping Lachares. Flament's notion that, after Alexander, Macedonian and other regal coinages supplanted Athenian coinage as a preferred international currency for military payrolls and other purposes may be true east of the Aegean, but it does not apply to patterns of monetary use in southern Greece, Thessaly, and the north, where a total of 24 3rd-century hoards show that Athenian pi-style and later owl silver continued to circulate as a high-demand coinage down into the last quarter of that century.[51] Apart from this, it is hard to imagine soldiers refusing payment in a gold coinage of any variety.[52]

In sum, the strength of the attribution of the second and major pi-style gold coinage to Lachares rests on its unproblematic, coherent simplicity. But a problem remains nevertheless, namely, how are we to understand the earlier gold pi-style staters that lack the reverse symbol? As observed above in note 41, the three extant specimens of this variety were struck from a

47. See *Agora* XXVI, p. 28, with indexes II.3, II.4; Sv. 22.29–40, 24.42–50, 104.8, 9.

48. Bingen 1969, p. 17.

49. Head 1911, p. 375, nn. 1, 2; Sv. 114.17–22; Kinns 1984, pp. 27–28, no. 29, pl. 3.

50. Svoronos (1927, pp. 168–169) conjectured, plausibly (see Habicht 1997, p. 310), that the gold from which the Mithradates-Aristion staters of 87/6 were struck was probably gold that Aristion had removed from the temple treasure of Apollo on Delos and brought to Athens in the previous year.

51. Nicolet-Pierre and Kroll 1990.

52. Flament, while proposing that Lachares must have minted pseudo-Philip or pseudo-Alexander gold staters, did not attempt to identify any variety among the many extant gold staters of these kings in support of this hypothesis.

single reverse die that happened to have been partially encrusted with rust. Since the diameters of gold staters and silver drachms are identical, the dies for this earlier gold were probably silver drachm dies that, having been unused for some time, were withdrawn from storage and suddenly pressed into service at a point before the dies for the minting of the Eleusis-ring gold had been prepared. One possibility is that the two pi gold coinages represent two phases of Lachares' gold, which may have been struck either continuously, with no interval between them, or in two stages. In either case, the earlier staters without symbol would belong to the 290s. The alternative possibility is that the staters without symbol were struck in connection with an earlier military emergency, such as the run-up to Chaironeia, as Koehler suggested, or during Athens' struggles against Antipater after the death of Alexander, or, to mention one more hypothetical occasion, during Cassander's siege of Athens in 304.

I do not know of any evidence, stylistic or otherwise, that would help decide among these possibilities. One of the earlier staters comes from the Thorikos hoard (hoard **3**), and if Bingen was correct in assuming that the burial of the hoard—and damage to the mining infrastructure in southeast Attica,[53] which ended the minting of pi-style silver—resulted from Demetrios Poliorcetes' plundering of Attica during his siege in the spring of 295, the coin must have been struck before then, but how much so? A month, a year, a decade, or more? For the present, I believe this question has to remain open. But this question only, since we have every reason to believe that the more substantial gold coinage with the Eleusis-ring symbol should date to Lachares' defense of Athens during the siege of 295.

53. By infrastructure, I refer above all to the great number of slaves, who were the most indispensable and costly element in the silver extraction industry. Whether by escape or capture, they were also the most vulnerable to enemy attack.

APPENDIX 2
COIN HOARDS CITED

Greece outside of Attica

1 Delos 1910 (*IGCH* 110; Flament 2007a, p. 233; color photograph in Evgenidou and Tselekas 2010, pp. 28–29). Pot hoard of 50 fresh pi-style tetradrachms (42 illustrated in Sv. pl. 30), all Pi II and III, except perhaps for one or two Pi I. There is a notable amount of die duplication. Five specimens have an elongated oval shape. This being the earliest known hoard of pi-style tetradrachms, it dates near the middle of the 4th century.

2 Myonia, near Delphi (*IGCH* 66; Flament 2007a, pp. 128, 181; 2007b, pp. 98–99). One Pi V tetradrachm found with 12+ Amphictyonic staters, buried ca. 335–330. The dulled relief of the tetradrachm's obverse may result from the use of a worn die rather than (as Flament suggests) prolonged circulation of the coin itself.[54]

Attica

3 Thorikos 1969 (*IGCH* 134; Flament 2007a, pp. 125–128, 233–234). Two hundred eighty-two pi-style tetradrachms, about two-thirds of which are Pi V, along with four worn Attic triobols, a gold Pi V stater without symbol, and five Macedonian regal gold and silver coins, the latest of which, a posthumous gold stater of Philip II, gives a terminus post quem of 310 for the hoard's burial. Primarily because of the Athenian gold stater, which has long been identified with the gold coins minted by the Athenian general and tyrant Lachares during Demetrios Poliorcetes' siege of Athens in the spring of 295 (see Appendix 1), Bingen proposed that the hoard dated to that year and was in all probability hidden away in anticipation of Demetrios's marauding operations in the Attic countryside in connection with the siege (Plut. *Dem.* 33).[55] Alternatively, if the gold stater without a symbol happened to have been minted on some earlier occasion, the burial could date to the last decade of the 4th century rather than the first decade of the 3rd.

4 Piraeus 1937 or 1938 (*IGCH* 125, listed as "Attica, c. 1937"). Ca. 600 pi-style tetradrachms, of which a lot of 162 in Athens has yet to be published. The 100 tetradrachms in Athens illustrated as *CoinH* III.27 (Piraeus 1938) is apparently a second lot from the same hoard. The accompanying note in *CoinH* III states that there is no die duplication. The four Pi V tetradrachms illustrated in Nicolet-Pierre and Kroll 1990, p. 3, pl. 1, are from this hoard. A late pi-style hoard, with a preponderance of Pi V pieces.

54. For 24 3rd-century hoards from Greece and the Balkans containing pi-style tetradrachms, see Nicolet-Pierre and Kroll 1990. Especially notable are Thessaly/Pherai 1938 (*IGCH* 168, ca. 260): 52+ pi-style tetradrachms; and Corinth 1938 (*IGCH* 187, ca. 215): 89 pi-style tetradrachms.

55. Bingen 1969, pp. 11–16.

5 Athenian Agora 2005 (Camp 2007, pp. 658–660, fig. 32). Three hundred eighty-five tetradrachms, all pi-style except at least one of earlier 4th-century type, found in a corroded mass beneath the floor of a building. As of April 2010 less than half of the coins had been cleaned. Another late pi-style hoard (mostly Pi V). Publication by dies will be undertaken by Irini Marathaki.

Hoards of Silver Fractions

6 Ag. Ioannis Rentis 1961 (*IGCH* 89; color photograph in Evgenidou and Tselekas 2010, pp. 20–21). Lamp hoard, comprising a worn 5th-century drachm and 12 triobol and diobols of earlier 4th-century type (Kroll 2006, pp. 60–61). Burial of the first half of the 4th century.

7 Anavyssos 1948 (*IGCH* 135). A single, fresh Pi II or III tetradrachm (elongated oval shape; obverse style similar to obverses in Delos 1910 hoard), 11 heavily worn 5th-century drachms, and 51 fractions—23 triobols, 10 diobols, 8 obols, 5 tritemoria, and 5 hemiobols—most of which are worn specimens of earlier 4th-century varieties. Nevertheless, a few of these fractions belong to the pi-style period, as indicated by the lowered alpha on the reverses of the freshest obols and hemiobols, and by the elongated oval shape of the one unworn tritemorion. In an earlier summary of this hoard, Picard observed that five of the least-worn triobols have the pi-style helmet ornament,[56] but since the ornament is actually of the Pi I type that was characteristic also of the earlier 4th-century silver, it is unclear whether any of these latest triobols were in fact of pi-style mintage. None of these coins have been published with photographs. Burial near or soon after the middle of the 4th century.[57]

8 Kaki Thalassa 1968 (*IGCH* 128; Picard 1969). Lamp hoard with two tetradrachms, 14 triobols, and two hemiobols, all pi-style except for three or more worn triobols of the earlier 4th century (certainly nos. 4, 5, 8). One of the tetradrachms (shown to be pi-style by the straight edge of its flan from folding) has a heavily worn obverse; the other (no later than Pi III or IV) is fresh. The find is definitely later than the hoard from Anavyssos (**7**) and is probably earlier than the 1956 hoard from Piraeus (**9**).

9 Piraeus 1956 (*IGCH* 127; Thompson 1957). Pot hoard containing 89 pieces of small denomination silver, drachms to hemiobols, most of which can be classified as pi-style. At least four of the 64 triobols are worn, pre-pi strikings of the first half of the 4th century (nos. 3–5, 12), as shown by their compact owls, delicate olive sprays, and carefully centered striking. Margaret Thompson was probably correct to date thisassemblage late in the 4th century, if not early 3rd, for whereas many of the pi triobols especially are in a fairly fresh condition, a number look heavily worn (nos. 8, 10, 15–18). Thompson attributed some of this wear to the overuse of worn obverse dies, but about half of these pi specimens show wear on both sides, implying a lengthy interval between the start of the pi silver and the closing of the hoard.

Sicily

10 Lentini 1957 (*IGCH* 2117). Sicilian silver and 19 Athenian tetradrachms, all of the first half of the 4th century (cf. Kroll 2006, pp. 59–61). Nicolet-Pierre and Arnold-Biucchi (2000) provide excellent photographs of the tetradrachms and a discussion of the hoard's date in the first third of the century.

Other Sicilian hoards of the first half of the 4th century that have produced two or more Athenian profile-eye tetradrachms of pre-pi type are Contessa 1888 (*IGCH* 2119; see Breglia 1969, pl. III.7), Manfria-Gela 1948, and Licata 1926 (*IGCH* 2121, 2130).

56. Picard 1969, p. 828.

57. The worn 5th-century drachms in this hoard and in hoard **6** point to the curious fact that no drachms seem to have been struck during the first half of the 4th century. Minting in silver during that period was limited to tetradrachms (e.g., Sv. 19.5, 13–16, 25, 32), triobols (Sv. 21.43), diobols (Sv. 21.60–62), and a few smaller denominations.

Egypt

11 Tell el Maskhouta 1947–1948 (*IGCH* 1649). Over 6,000 Athenian 5th-century tetradrachms with some imitations and at least one tetradrachm of earlier 4th-century type: Naster 1948, pl. 1:12 = Flament 2007b, pl. 2:2.

12 Tel el Athrib 1903 (*IGCH* 1663). Forty pi-style tetradrachms (Nicolet-Pierre 2001, nos. 1–40, of which five are illustrated as Sv. 26.20–24), and 28 tetradrachms of earlier 4th-century type (Nicolet-Pierre 2001, nos. 42–69; Sv. 26.2–19). The remaining tetradrachms are worn 5th-century specimens and various imitations of 5th- and 4th-century Athenian types.

13 "Nahman's Hoard" early 1920s (van Alfen 2002b, p. 62, pl. 13). Nine tetradrachms of 5th- and earlier 4th-century type. Some of these may be imitative, but at least four of the earlier 4th-century profile-eye tetradrachms (nos. 5–8) are genuine.

The Levant and Iraq

14 Syria 1989 (*CoinH* VIII.158). The legible owl portion of the hoard (van Alfen 2002a, pls. 1–7) consists of 90 pi-style tetradrachms (nos. 1–47, 49–91), one genuine earlier 4th-century tetradrachm (no. 48), and 41 pseudo-Athenian imitations (nos. 91–132). Most of the genuine pi tetradrachms are classified as Pi II and IV, but at least 10 are Pi V.

15 "ANS Near East" late 1980s (Anderson and van Alfen 2008, pls. 47–58). A hoard very similar to (if not actually a part of) hoard **14**, but with 353 pi-style tetradrachms (to Pi V) (nos. 116–118, 120–469); nine Athenian tetradrachms of earlier 4th-century type (nos. 104, 106, 107, 110–114, 119); and 72 remaining tetradrachms of 5th-century type, both genuine and imitative, 4th-century type imitations, and uncertain. The publishers of the hoard propose a burial date between 334 and 330.

16 Near East Owl and Bullion hoard (van Alfen 2004–2005, pls. 6–13). Another (probably) Levantine hoard of the 330s, this one consisting entirely of 76 Athenian and pseudo-Athenian tetradrachms of 5th- and 4th-century types and two small ingots. Relevant to the present article are the bona fide Athenian tetradrachms of the 4th century: approximately 30 legible pi-style tetradrachms (Pi I–V) and one tetradrachm of the earlier 4th-century profile-eye type (no. 29).

17 Iraq 1973 (*CoinH* VII.188), a hoard buried probably around 323. Van Alfen (2000) illustrates and analyzes the 163 Athenian owl pieces in the deposit. Of these, nos. 1–45 are genuine or probably genuine pi-style tetradrachms (Pi I–V). The rest of the owls are imitations.

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