

JOHN H. KROLL *

ATHENIAN TETRADRACHM COINAGE OF THE FIRST HALF OF THE FOURTH CENTURY BC

Abstract – Because all earlier 4th-century tetradrachms in Attica were called in and restruck in the year 354/3 BC, hardly any of that coinage has survived except for specimens that had been exported before the restriking and were buried abroad, especially in Egyptian and Sicilian hoards. The Athenian components of several of these hoards together with other published and unpublished tetradrachms make it clear that this coinage of c.400/390 to 353 was not only substantial, but was one of the most prolific Greek coinages of the period. Discussed also is the literary evidence pertaining to the start of the coinage and the origin of the owl tetradrachms belonging to Buttrely's *STYLE X*.

AS KNOWN FROM HOARDS and the numbers of pieces in major public collections, Athens' tetradrachm coinage in the 5th century was enormous, as was the Athenian *pi*-style tetradrachm coinage of the second half of the 4th century. But because of the rarity of extant specimens from the coinage in between, scholars (myself included) have routinely assumed that the coinage of the first half of the 4th century was extremely modest in size and that its apparent insignificance can be attributed to the difficulties that the Athenians faced in reviving their silver mining industry after the disruptions of the Peloponnesian War. ^[1] In a recent re-examination of the *pi*-style coinage, however, it has emerged that the comparative paucity of surviving owl tetradrachms from the first half of the 4th century is due not to an insubstantial level of production but rather to the fact that in the year 353 all tetradrachms in Attica were called in and restruck into *pi*-style tetradrachms. ^[2] This discovery naturally calls for a re-appraisal of the earlier 4th century coinage, which has long been needed anyway since the coinage has remained largely unstudied. In the analyses

* john.kroll@classics.ox.ac.uk

[1] J.H. KROLL, *The Athenian Agora, Results of Excavations Conducted by the American School of Classical Studies*, vol. 26, *The Greek Coins*, Princeton 1993, p. 8. FLAMENT 2007A, p. 124. Following R.J. HOPPER, *Trade and Industry in Classical Greece*, London 1979, p. 177-180, B.S. STRAUSS, *Athens after the Peloponnesian War, Class, Faction, and Policy 403-386 BC*, London & Sydney 1986, p. 46, concludes: "The [mining] industry did not recover until the mid-fourth century."

[2] J.H. KROLL, The reminting of Athenian silver coinage, 353 BC, *Hesperia* 80 (2011), p. 229-256.

that follow, my aim has been to initiate a re-appraisal by reviewing the salient features of the coinage, the evidence for its chronology, and, above all, the data from dies revealing that it was a very substantial coinage indeed.

I. DESIGN AND 353 BC END DATE



Fig. 1A – late 5th century BC (BM)



Fig. 1B – first half 4th century BC (ANS)

Athenian tetradrachms of the first half of the 4th century, such as the one depicted as fig. 1B, are primarily distinguished from tetradrachms of 5th-century type (fig. 1A) by the rendering of Athena's eye. In contrast to the archaic, frontal eye of the earlier coins, the eye of the 4th-century coins is naturalistically rendered in a profile view, often including the slight bulge of the eyeball. This detail is accompanied by three further design innovations. (a) The ear of Athena – previously delineated by two more or less parallel lines extending up from her earring and shaped with attention to the ear's differing upper and lower contours – is more simply rendered, often in a single circular outline, with a dot (known in the literature as the *point tragus*; see FLAMENT 2007A, p. 125 with fig. 4.1) above the earring. (b) The floral ornament on the goddess' helmet is smaller and more delicate, formed with fine lines and two upper and two lower lateral leaves that frequently terminate in sharply turned-up or turned-out hooks. (c) On reverses, leaving aside differing proportions of the owls, the *alphas* are engraved differently: on all 5th-century tetradrachms the *alpha* appears in full (A/A/A), with its lower left foot touching the side of the owl's head; on all tetradrachms of the first half of the 4th century the left leg of the *alpha* is cut off at the middle (A), allowing the letter to fit more tightly up against the owl's head, and making the design within the incuse square frame more compact.



Fig. 1C – pi-style 353-c.295 BC (ANS)



Fig. 1D – pi-style 353-c.295 BC (ANS)



Comparing the earlier 4th-century tetradrachm of fig. 1B with the later, *pi*-style tetradrachms of fig. 1C and 1D, one finds that, apart from the longer and more linear formation of the helmet ornaments, the elements of the *pi*-style Athena heads are otherwise the same as before, whereas the *alpha* on reverses has been lowered so that its left diagonal, now restored in full, is slotted into the indentation between head and shoulder at the owl's neck.

One might assume that the lowering of the *alpha* was a further step in producing a more compact design were there not another major difference between the two 4th-century tetradrachm series as well. Whereas the earlier 4th-century tetradrachms were, like typical owl tetradrachms of the 5th century, struck on flans that had been cast solid, every *pi*-style tetradrachm was struck on a flan that was formed – as one can see from layering along the coin's edge – from a thin, hammered disk that had been folded over, usually twice; when struck, the result was often a coin of distorted and irregular shape. The *pi*-style specimen of fig. 1D is an extreme example; its triangular shape reveals that the flat disk had been folded over in half and then folded again into quarters before striking. The sandwiched layering along at least one edge of other *pi*-style tetradrachms is frequently just as clear.^[3] This flattened and folded technique for making flans was employed for overstriking one coinage (the *pi*-style tetradrachms) over another of the same weight standard, and because of the massive extent of the overstriking, the restruck earlier coinage can only have been all of the tetradrachms previously circulating in Athens, namely, the tetradrachms of the earlier 4th-century type. That is why the new *pi*-style silver was redesigned with the lowered reverse *alpha*: so that after the restriking only the new coins with the easily recognizable lowered *alphas* would be acceptable as legal tender (in Greek, *dokimon*). In my discussion of this overstriking program, I have explained that its purpose was to raise revenue for the city of Athens at a time when the city had been impoverished by the Social War, that the Athenian law authorizing the restriking survives in an unpublished fragmentary inscription from the Athenian Agora, and that the dating formula in the inscription allows us to date the restriking to the year 353 BC.^[4]

For purposes of the present paper, the restriking has two important consequences. It gives an exact date for the start of the *pi* silver and the end of the earlier 4th-century coinage that preceded it. And it explains, as mentioned, why tetradrachms of the first half of the century are relatively scarce. All of them that were circulating or held in savings in Attica in the year 353 disappeared when they were called in and converted into *pi*-style tetra-

[3] *Ibid.*, fig. 5, 6, 8 and 9.

[4] *Ibid.*, p. 238–240.

drachms with the lowered *alpha*. I know of only two earlier 4th-century tetradrachms that have been found in Athens. ^[5] All other specimens for which there is a known or inferred provenience (more than 80 altogether) are from hoards in Sicily, Egypt, and in a few instances the Levant ^[6]; these are coins that must have been exported from Attica before 353, thus escaping the restriking. The tetradrachms found in Sicily and Egypt were presumably carried there for the purchase of Sicilian and Egyptian grain.

II. INCEPTION IN 393 ?

What little attention Athenian tetradrachms of the first half of the 4th century have received has focused primarily on their inception, which on the conventional view is believed to have occurred in or soon after 393, a date indirectly derived from textual inferences. The key passage is Aristophanes' *Ecclesiazusae* – now believed to have been produced in 391 or, less probably, a year earlier or later ^[7] – *ℓ.* 815-822, where the speaker refers to the bronze coinage that the Athenians voted and to the herald's proclamation when it was demonetized "not to accept bronze any longer, for we are using silver." In 393 the Athenian Conon, as admiral of the Persian fleet that had defeated the Spartan navy at Cnidus, brought the fleet to Athens and with it a large subvention of Persian money to hasten the rebuilding of the Long Walls and the walls of the Piraeus and to continue naval operations against Sparta (Xen., *Hell.* 4.8.8-10). According to the orthodox reconstruction that goes back at least to the 1880s ^[8] and recently has been elaborated by Christophe Flament, it was this Persian money that enabled the Athenians to demonetize the bronze and to begin coining silver for the first time since the last years of the Peloponnesian War. ^[9]

The reconstruction rests on the assumption that Athens' silver-plated bronze coinage, issued in 406/405 as an emergency measure, continued to

[5] Agora coins N 12175, *ibid.*, fig. 4:a, and N 74094, an unpublished tetradrachm from the late 4th-century 2005 Agora hoard, *ibid.*, p. 240, n. 29, and p. 256.

[6] See *ibid.*, p. 256-257, hoards no. 10-17; and Table 1, p. 20-21.

[7] For the date, STRAUSS, *op. cit.* [n. 1], p. 149, note 85; A.H. SOMMERSTEIN, *Ecclesiazusae, the Comedies of Aristophanes*, vol. 10, Warminster 1988, p. 4-7; J. HENDERSON, *Aristophanes, Frogs, Assemblywomen, Wealth*, Cambridge (MA) & London 2002, p. 238.

[8] E.g., B.V. HEAD, *British Museum Catalogue of Greece Coins. Attica – Megara – Aegina*, London 1888, p. XXIX.

[9] FLAMENT 2007A, p. 121-124; 2007B, p. 95-97. But Flament goes too far in alleging that in *Plutus*, *ℓ.* 170-174, Aristophanes attributes the manning of ships, the support of mercenary peltasts, and attendance at the Assembly to Persian money. The text merely attributes these activities to the god Plutus/Wealth.

circulate as Athens' sole currency for as many as twelve years before being replaced with silver. But not only is such a prolonged use of a hugely over-valued fiduciary coinage monetarily implausible, it also overlooks references to money that imply that normal silver currency had been restored before 393. The speaker at Lysias 14.14, states that during the mobilization for the Haliartus campaign in 394, he helped two impecunious soldiers meet the costs of service by giving them thirty drachms each. In a speech delivered in 399, Andocides refers to a thousand drachms that was paid as a bribe in the previous year and to thirty-six talents that a tax-farming syndicate collected in 402 from the two-percent harbor tax; of this amount the members of the syndicate were able to keep six talents in profit (And. 1.121 and 133–134). It is hard to imagine that at the time of these passages the Athenians were using any coinage other than their conventional coinage of silver.

In *Ecclesiazusae*, ll. 813–829, the bronze coinage is mentioned as just one of three pieces of legislation with laughable outcomes that the Athenian Assembly had voted in the past. Since the bronze coinage was voted in 406/5, and since Aristophanes' speaker asks his friend to recall "when we voted for it" (not when it was demonetized), it is not at all clear from the context when after 405 the silver currency was re-established. I am not alone in suspecting that the emergency war bronze was withdrawn in favor of silver when the war ended in 404 or when democratic government was restored a year later.^[10] In an important note Adalberto Giovannini explains that the withdrawal of the bronze through an exchange for silver may have been a gradual process that began in 404 and only ended with the herald's declaration of demonetization.^[11] But even an incremental exchange need not have required more than a few years. At the end of the war there was plenty of Athenian silver coinage in private purses and savings. A wealthy metic like Lysias had three talents of it in the strongbox in his house (Lysias, 12.11). When needed, such silver on hand would not have been withheld from circulation.

When Athens began to mint new silver coins is of course a different question entirely, since it depended on the acquisition of new silver and/or

[10] J.H. KROLL, Aristophanes' *πονηρὰ χαλκία* : a reply, *GRBS* 17 (1976), p. 339–341; and *op. cit.* [n. 1], p. 8. S. ALESSANDRI, Il significato storico della legge di Nicofonte sul *dokimastes* monetario, *Annali della scuola normale superiore di Pisa*, ser. 3, 14 (1984), p. 391.

[11] A. GIOVANNINI, Athenian currency in the late fifth and early fourth century BC, *GRBS* 16 (1975), p. 190, n. 19. Noting that the demonetization of the bronze took place sometime between 403 and 392, SOMMERSTEIN, *op. cit.* [n. 7], p. 209, notes that it was "perhaps more likely early than late in that period since the taxation decree of [*Ecclesiazusae*, ll. 823–829] is described as 'recent' in apparent contrast to the coinage changes."

the reminting of old. While new silver from the Persians in 393 remains a possibility, there is nothing in the literary sources that precludes a revival of Athenian minting from domestic resources before that date.

III. EARLY FOURTH CENTURY ATHENIAN TETRADRACHMS IN SICILIAN HOARDS ^[12]

That Athens resumed the minting of silver in quantity early in the 4th century is clear from three hoards that are the earliest finds known to contain Athenian tetradrachms of early 4th-century type. In addition to their importance for chronology, the hoards also provide some of the most informative assemblages of early 4th-century Athenian silver that have yet come to light. The hoards are Sicilian, and on the basis of their Sicilian and Athenian contents are dated in the *Inventory of Greek Coins Hoards* to c.390? (Lentini) or between c.390-380 BC (Manfria and Contessa), datings that in general terms hold up under further scrutiny. In all three hoards, the latest pieces from Sicilian Greek mints are the Syracusan decadrachms, a coinage that for some time has been recognized as belonging to the long tyranny of Dionysius I (404-367). It is comprised of three groups: decadrachms signed by Kimon (c.404-400), those signed by Euainetos (c.404-390), and, thereafter, those of Euainetos type with symbols but without the signature; these continued to be struck certainly to c.380, and possibly to the end of Dionysius' reign in 367. ^[13]

[12] For my study of the hoards and their Attic tetradrachms, I am indebted to Christof Boehringer and Maria Caccamo Caltabiano for correspondence, to Peter van Alfen for assistance with photos of the Lentini tetradrachms at the ANS, and, above all, to the curators in the Gela and Syracuse museums who in 1970 kindly provided me with the photographs of the Manfria and Licata coins reproduced on pl. II-IV, and to Lucina Gandolfo of the Archaeological Museum, Palermo, for the photo of the previously unpublished Contessa hoard coin (N.I. 26008) reproduced as pl. IV.5.

[13] For the chronology, see C. ARNOLD-BIUCCHI, Syracusan dekadrachms revisited, *NZ* 116/117 (2008) (Festschrift für Günther Dembski), p. 18-24, and her earlier summary in H. NICOLET-PIERRE & C. ARNOLD-BIUCCHI, *Le trésor de Lentini (Sicile) 1957 (IGCH 2117)*, in S. MANI-HURTER & C. ARNOLD-BIUCCHI (eds.), *Pour Denyse, Divertissements Numismatiques*, Bern 2000, p. 166-167. Another recent chronological review but one that focuses on the tetradrachm coinage that preceded the decadrachms is K. RUTTER, *Dating the Period of the "Signing Artists" of Sicilian Coinage*, in D.B. COUNTS & A.S. TUCK (eds.), *Koine, Mediterranean studies in honor of R. Ross Holloway*, Oxford & Oakville 2009, p. 124-139. The lone dissenting specialist in Sicilian numismatics is M. CACCAMO CALTABIANO (*I decadrachmi di Evainetos e Kimon : per un spedizione navale in Oriente, Studi per Laura Breglia*, *BollNum*, Suppl. 4, 1987, p. 119-137), who prefers a somewhat earlier chronology for the decadrachms. So far as the eye-in-profile Athenian tetradrachms in the hoards are concerned, an earlier dating of the decadrachms

The Lentini 1957 hoard from South Eastern Sicily (IGCH 2117), the least securely dated, is by far the richest in Athenian material (pl. I.1-12, II.1-7). Four of the hoard's nineteen owl tetradrachms (pl. I.1 and II.1, 5 and 7) were purchased by the American Numismatic Society in 1959. The remaining tetradrachms are known only from photographs that were sent to the ANS by Leo Mildenberg, who also described eleven Sicilian coins from the hoard that were dispersed without having been photographed.^[14] The latest Sicilian pieces were *fleur-de-coin* Syracusan decadrachms of general Euainetos type, which led Kraay to assign a date of c.390? to the find in IGCH. In the article on the hoard that Carmen Arnold-Biucchi co-authored with Hélène Nicolet-Pierre, she ventured that the decadrachms might belong to the unsigned group, in which case the burial date could belong to the 380s, the 370s, or even as late as the 360s.^[15]

As one can see at a glance from the photos, the Athenian tetradrachms are also in a very fresh condition and display a wide range of stylistic variation. There is only one instance of obverse die duplication, between coins pl. II.2 and 3. Among the eighteen obverse dies, we can identify two small stylistic groupings, one with boldly designed, round Athena heads with large, widely open, and heavily outlined eyes (pl. I.1-2), and at the opposite end of the spectrum, a group with Athena heads that have fine, delicately shaped eyes and noses (pl. II.4-7). The Athena heads on the rest of the coins have various intermediate and unexceptional features, including the standard form of helmet ornament with hooked lateral leaves common to all these obverses. The large featured, bold type of obverse may be early but it is clear that the other obverses do not unfold in a stylistically linear progression, with the fine heads necessarily last, for, whereas some early obverses of the succeeding *pi*-style tetradrachms are fine and delicate like the one illustrated in fig. 1C, plenty others are not.^[16] Apparently the variety of facial proportions and features reflects the stylistic proclivities of individual die cutters.

I once assumed from the great variety of obverse styles and the elegance of many of them that the hoard's burial ought to fall as late in the first half

would not make any difference, since the Attic tetradrachms and therefore the hoards cannot be placed before c.400.

[14] Mildenberg's information and his photos with weights of all nineteen of the Athenian coins were published by NICOLET-PIERRE & ARNOLD-BIUCCHI, *op. cit.* [n. 13], p. 165-171, pl. 18 and 19. I reproduce the same photographs but in a different order.

[15] NICOLET-PIERRE & ARNOLD-BIUCCHI, *op. cit.* [n. 13], p. 165-169; similarly, ARNOLD-BIUCCHI, *op. cit.* [n. 13], p. 20, n. 48.

[16] Cf. KROLL, *op. cit.* [n. 2], fig. 5, 6 and 8.

of the 4th century as the partially-described Syracusan decadrachms would allow, say in the 360s; ^[17] but as we see from the two other Sicilian hoards, this need not be so. The other hoards imply that such Athenian obverses as are found in the Lentini assemblage were being struck early on, and could date very well to the second decade of the 4th century. Thus the near equivalence of obverse dies to the number of coins in the find suggests the hoard's eighteen obverse tetradrachm dies are but a fraction of the total number of obverse dies that had been engraved, not for the production of this earlier 4th-century coinage as a whole, but for only the first third or half of a coinage that continued to be struck for another twenty-five or thirty years. Even by Athenian standards, it was, before it was all restruck in 353, by no means the minor coinage that it commonly had been thought to be.

We are on firmer chronological ground with a second hoard from SE Sicily, recovered in 1948 at Manfria, near Gela (*IGCH* 2121). In the 1950s Kenneth Jenkins examined the forty-eight coins saved from the hoard in the Gela Museum, ^[18] and, despite their heavy corrosion, identified the fourteen Euainetos-type Syracusan decadrachms as early issues with the artist's signature. While this in itself might allow for a burial in the later 390s, Jenkins proposed *c.* 390–380 because he was struck by the similarity of the find to the Contessa hoard (*below*), which also has profile-eye Athenian coins that he thought must belong after 393.

In Manfria there are eighteen Athenian tetradrachms, a number of which are badly preserved or heavily over-cleaned. Jenkins identified ten of them as being 5th-century types, presumably those illustrated here as pl. II-8-11 and III-1-6, on which the head of Athena is shown with a frontal or largely frontal eye (from the photographs it is hard in some cases to be sure). Among these pieces at least three (pl. III-2-4) are related to the problematic group of crude and arguably imitative owls that belong to Theodore Buttrey's *STYLE X* (see *below*). Of the eight Athenian tetradrachms with clearly 4th-century, profile eyes, the first (pl. III-7) might belong with the large-eye, bold group, but among the better-preserved specimens, it is the next four (pl. III-8-11) that are most notable since they have the soft visage and refined eyes, noses, and mouths of the more delicate, and hence most advanced-looking Athena heads in the Lentini hoard. Accordingly, there does not seem to be any reason why the Lentini assemblage should be appreciably later, if it is later at all, than the Manfria find.

^[17] J.H. KROLL, Athenian tetradrachms recently discovered in the Athenian Agora, *RN* 162 (2006), p. 60–61.

^[18] G.K. JENKINS, *The Coinage of Gela (Antike Münzen und Geschnittene Steine II)*, Berlin 1970, p. 153, no. 15.

The much larger and more varied Contessa 1888 find (IGCH 2119) is a deposit of 113 coins, all but seven of which are Sicilian and come from fourteen different Greek and Siculo-Punic mints on the island. The latest of the Sicilian Greek coins are the latest signed decadrachms of Euainetos (with the letter Δ), but in his review of the hoard, Jenkins was guided by the find's Athenian profile-eye tetradrachms to date the burial after 393 to c.390/380. ^[19] Subsequently this dating has found some confirmation from Jenkins' study of the Punic coinages of Sicily and is no longer dependent on an assumed *terminus post quem* for the latest Athenian pieces. Two of the Punic series are especially well represented in Contessa, and since the run of Contessa specimens is nearly duplicated in the Punic component of a large hoard that was buried near Rhegium in 387, ^[20] the parallelism implies a burial for Contessa in the early to mid 380s, which, by extension, strengthens the 380s for Manfria.

From his inspection of the Contessa coins, Jenkins noted that two of the three Attic tetradrachms are of the 4th-century type. These would be our pl. iv.4 and 5, both typical earlier 4th-century owls that would not be out of place among the Lentini coins. The third Contessa tetradrachm, pl. iv.3, differs from them in two respects. The first is the shape of Athena's eye, which, as in quite a lot of late 5th-century owl coinage, including the 407 gold and 406 silver-plated bronze drachms, ^[21] is rendered as partially frontal but, being slightly open at the front, partially in profile, in a configuration that is sometimes described as a three-quarter profile eye. Still, Athena's ear (with the *point tragus*), the small, compact helmet ornament, and on the reverse the partially truncated *alpha* show that the coin cannot be grouped with 5th-century owls. Rather it would appear to be a transitional striking that presumably stood at the very beginning of the new 4th-century series, at a moment before the die-cutters abandoned the eye in three-quarter profile for one in full profile. The other detail that sets the first Contessa tetradrachm apart is the distinctive way the owl's left foot

[19] *Ibid.*, p. 149, no. 8.

[20] Vito Superiore 1939 (IGCH 1910), the burial of which is dated to the fall of Rhegium to Dionysius I. For the close similarity of two Punic series in both hoards, see G.K. JENKINS, *Coins of Punic Sicily*, Part 4, *SNR* 57 (1978), p. 55 and 67. The four Panormus (*ziz/sys*) tetradrachms in Vito come down to die-combination 30; the four in Contessa come down to the end of the series in die-combination 34. The parallelism is much closer in the Carthage tetradrachms: the seven in Vito come down to the penultimate die-combination 46, whereas the twelve in Contessa come down to die-combination 47, the final combination in the series.

[21] Illustrations of the gold and silver-plated bronze: Sv., pl. 15.1-13, 19-26. FLAMENT 2007A, p. 118, fig. 30, and p. 120, tabl. 3.

is rendered in two short parallel lines that slant right up to and touch the *epsilon* of the ethnic. It is a rendering that immediately plunges us into the controversial status of the notorious family of early 4th-century owl tetradrachms disparagingly dubbed by Buttrey in 1982 as STYLE X. ^[22]

IV. STYLE X

The STYLE X owls are easy to recognize, as one can see from the four owl tetradrachms in another Sicilian hoard, Licata 1926 (*IGCH* 2130), dated c.350-340 by its Corinthian staters. Two of the owls (pl. IV.8-9) are standard 4th-century Athenian specimens of the pre-353 era. The two others (pl. IV.6-7) are standard STYLE X. Like all of the STYLE X tetradrachms they have the two-tier left foot extension that we have seen on the Contessa coin, the lines of the foot rising towards the *epsilon* at a slight angle. Just as typically, the die cutting of the STYLE X Athenas is rudimentary, inorganic, and highly linear. Noses and chins tend to be pointed. Eyes are frontal, nearly or entirely closed at the front, and usually narrow. Ears, too, continue the 5th-century design. And the helmet ornament is *sui generis*: its three thick lower extensions are practically parallel to each other in an arrangement that is devoid of 5th-century antecedents or unlike any 4th-century configuration before the advent of the developed *pi*-style ornament after 353 BC. Yet the hoard evidence unequivocally shows that the STYLE X tetradrachms were struck early in the 4th century.

They circulated ubiquitously. Besides the twenty-odd specimens with proveniences in Egypt, including those from the Tell el-Maskhuta hoard (*IGCH* 1649) and the Fayum 1933-1934 hoard, ^[23] both of the first quarter of the 4th century, specimens have been recovered from Palestine, Syria, South

[22] T.V. BUTTREY, Pharaonic imitations of Athenian tetradrachms, in T. HACKENS & R. WEILLER (eds.), *Proceedings of the 9th International Congress of Numismatics, Bern, September 1979*, vol. 1, Louvain-la-Neuve & Luxembourg 1982, p. 137-140, pl. 21.

[23] For the Fayum (or "Karanis") hoard, see *ibid.*, and C. ARNOLD-BIUCCHI, La trouvaille de Fayoum 1933-1934 et le problème des chouettes égyptiennes, *Annuaire de l'École pratique des hautes études, Section des sciences historiques et philologiques, Résumés des conférences et travaux* 139 (2006-2007), p. 91. Arnold-Biucchi reports that the find contained only one Athenian eye-in-profile tetradrachm. Now that owl tetradrachms of Buttrey STYLES B and M are known to have been minted before the destruction of Sicilian Naxos in 402 (M.C. LENTINI & S. GARRAFFO, *Il tresoretto di Naxos* 1985, dall'isolato urbano C4, casa 1-2, *Istituto italiano di numismatica, Studie e materiali* no. 4, Rome 1995, p. 1-49, pl. 1-14 ; cf. FLAMENT 2003, and FLAMENT 2007A, p. 80-82), the burial of the Fayum hoard is to be placed early in the 4th century.

Central Anatolia, as well as Sicily. ^[24] Besides these canonical STYLE X pieces, there are a number of closely-related coins that have some of the STYLE X features but, like several tetradrachms in the Manfria hoard (pl. III-2-4), are designed with a variant type of obverse helmet ornament or a simplified, more conventional form of the extended reverse foot. ^[25]

It is obvious why with only one exception commentators have unhesitatingly assumed that these STYLE X tetradrachms were third-rate, pseudo-Athenian imitations. ^[26] Measured even against the haphazard standards of much late 5th-century Athenian die-engraving, the crude linearity of most of the STYLE X obverses places them in an inferior skill category altogether. But does this mean that they must be imitative strikings of foreign mintage? In two discussions published in 2007, Flament boldly insisted that they were not, and that they should be identified as among the earliest issues of Athens' resumed minting in the 390s. ^[27] Regarding the quality of the obverse die-cutting as irrelevant, he looked to two other criteria for mint attribution: the sources of the silver from which the coins were struck and the circumstance that the diagnostic design characteristic of the STYLE X reverses, namely the two-tiered, rising left foot of the owl, is shared with other owl tetradrachms with perfectly competent obverses.

[24] FLAMENT 2001, p. 44-45, lists published specimens – beginning with Sv., pl. 19.6-8 and 12 – and illustrates two tetradrachms from the Fayum hoard (pl. I-11-12), two from Tell el-Maskhuta (pl. II-3-4), and two from the Karaman (Lycaonia) hoard (IGCH 1243) (pl. II-1-2). The list is extended by P.G. VAN ALFEN, The “owls” from the 1989 Syria hoard, with a review of pre-Macedonian coinage in Egypt, *AJN*² 14 (2002), p. 19, with illustrations of the seven STYLE X tetradrachms at the ANS (pl. 11). Important additions are two pieces excavated in Palestine: H. GITLER, M. PONTING & O. TAL, Athenian tetradrachms from Tel Mikhhal (Israel) : a metallurgical perspective, *AJN*² 21 (2009), pl. 4-B2-B3; and one excavated from the submerged Egyptian port of Herakleion-Thonis : F. GODDIO, *Egypt's Sunken Treasures*, München & London 2008, p. 224 and 353, no. 436.

[25] E.g., FLAMENT 2007B, pl. I-2-3, 5-6 (all but one reproduced from sales catalogues), and GITLER, PONTING & TAL, *op. cit.* [n. 24], pl. 4, no. B1.

[26] For a recent affirmation of this view, see ARNOLD-BIUCCHI, *op. cit.* [n. 23], who nevertheless is disposed to accept Buttrey STYLE M and perhaps B tetradrachms as being of bonafide Athenian mintage. Specimens of both styles have turned up in hoards excavated in Attica: M. OECONOMIDES, Contribution à l'étude du monnayage athénien à l'époque classique : Le trésor trouvé au Pirée en 1977, *RBN CXLV* (1999), p. 17-20, pl. II-III; and *idem (suite)*, Le trésor trouvé à Ano Voula en 1979, *RN* 162 (2006), p. 73-76, pl. V-VI. Moreover, elemental analyses of more than thirty STYLE M and B tetradrachms by the PIXE technique indicate that all were minted from Laurion silver (FLAMENT & MARCHETTI 2004, p. 179-184). Of the two STYLE M tetradrachms subjected to chemical and isotopic analysis by GITLER, PONTING & TAL, *op. cit.* [n. 24], one (no. B7, cf. p. 36 and 48) was struck from Laurion silver, the other (no. B8, cf. p. 48) apparently from “mixed” silver.

[27] FLAMENT 2007A, p. 123-124, and in more detail, 2007B, p. 92-97.

In laboratory analyses of four STYLE X tetradrachms and one tetradrachm related to STYLE X, ^[28] the silver of only one of these coins was shown to contain the minimal copper and gold percentages that are indicative of Laurion silver, while the more elevated elemental percentages of the other four tetradrachms indicate that their silver came from non-Attic sources. This, Flament proposed, is exactly as one would expect from a coinage struck in Athens in the late 390s, when the city, he assumed, might have had some native silver on hand for minting but for the most part had to rely on silver received from the Persians for the prosecution of the Corinthian War against Sparta. In 2009 Haim Gitler, Matthew Pointing, and Oren Tal published their results of combined chemical and lead isotope analyses of eleven owl tetradrachms excavated at Tel Mikhal, Israel. In their report three tetradrachms, namely those that can be classified as or near STYLE X, stood apart from the rest as having been made from silver that was most unlike Laurion silver as measured by the coins' chemical and lead isotope signatures, ^[29] thus bringing the tally of STYLE X metallurgical results so far to one specimen struck from Attic silver, five from foreign silver (or seven if one includes the two tetradrachms that are close to STYLE X).

Although these analyses are consonant with the proposition that the coins could have been struck in Athens if and when the city was obliged to strike silver mostly from Persian subventions, they hardly rule out the alternative possibility that the STYLE X coins, including the one minted from Laurion silver, could just as well have been struck elsewhere, say in Egypt or the Levant. These places were dependent on imported silver, which in the course of the 5th century included massive quantities of silver from Attica, so much so that it would be surprising indeed if some Eastern imitations were not in fact made from Laurion silver. ^[30]

[28] For the analysis of two of the STYLE X tetradrachms, both from the Karaman hoard and now in Paris, see J. DIEBOLT & H. NICOLET-PIERRE, *Recherches sur le métal de tétradrachmes à types athéniens*, SNR 56 (1977), p. 83, and pl. 125, no. 2 and 3. The analysis of the three other tetradrachms, all in Brussels, from the Tell el-Maskhuta hoard, is reported in FLAMENT 2007B, p. 94-95. These are inv. II·37·516 (Attic silver) : illustrated in FLAMENT 2001, pl. II·4; inv. II·37·519 : *ibid.*, pl. II·4 = FLAMENT 2007B, pl. I·4; and inv. II·37·515 : FLAMENT 2001, pl. I·10 = FLAMENT 2007B, pl. I·11, but this last has an obverse with a different type of helmet ornament and facial character, and does not belong to STYLE X proper; in FLAMENT 2001 it is classified under "STYLE A" (*see below*).

[29] GITLER, PONTING & TAL, *op. cit.* [n. 24], p. 37-42. The coins are nos. B1-3, the ones cited above in n. 24 and 25.

[30] As its triangular shape indicates (and as Frédérique Duyrat of the Paris *Cabinet des Médailles* has kindly confirmed *per litt.*), the STYLE X tetradrachm from the Karaman hoard that is illustrated in FLAMENT 2007B, pl. I·1, has been restruck from another coin that had been flattened and twice folded over, in the technique

Flament's second observation points also in more than one direction. As he noted, the Contessa tetradrachm is not the only one with a *STYLE X* type reverse joined to an obverse struck from a proficiently engraved die. Two tetradrachms from the late 4th-century Tell el-Athrib hoard from Egypt (pl. v.1-2) are similar; the first of these seems to share its reverse die with the Contessa coin, and both, like the Contessa obverse, have an Athena with a largish, not fully profile eye, as does, though to a lesser extent, the next tetradrachm, pl. v.3, whose Athena head has a more maidenly appearance. I illustrate next to it another tetradrachm with a nearly identical obverse but a reverse owl with conventional feet. Positing that the curious *STYLE X* owl feet were the idiosyncratic work of a single die-engraver or group of engravers, Flament argued that all coins with this feature, those struck with competently engraved obverse dies and those whose obverse Athena heads are crude, are the products of a single coinage: either all must come from Athens or all must be considered foreign imitations. Since the silver of one *STYLE X* coin is known to have been Attic and the obverse dies of some tetradrachms with the extended owl's foot are quite fine, he concluded that all must have been struck in Athens.

Missing here, however, is consideration of a middle position, namely, the likelihood that the tetradrachms with the finer obverses are indeed Athenian, that the reverse type of owl with extended left foot was the creation of an engraver in Athens when the minting of the state coinage was revived, and that once minted and exported, tetradrachms with this type of owl's foot were copied abroad by imitators. In my view this is a far more satisfactory solution as it allows the *STYLE X* tetradrachms to be identified both by the way they look and by the silver from which they were struck as alien imitations.

V. SCALE AND IMPLICATIONS

If this solution is correct, the Contessa coin and others like it would belong to the earliest class of tetradrachms minted by Athens in the 4th century. ^[31]

described at the beginning of this paper. Since the technique was used for re-striking a coin into another coin of the same weight, there is reason to suspect that the original coin may have been an old owl from Attica.

^[31] Originally Flament (2001, p. 43) grouped such tetradrachms with *STYLE X* type reverses but with various other types of obverses under the rubric of "*STYLE A*", but later preferred to divide them into roughly-delineated subsets that include tetradrachms with regular owl reverses (FLAMENT 2007B, p. 93, with pl. 1.9-11 and 11). At least one of these coins (regular owl reverse) was struck from Attic silver (Brussels, inv. 11.37.518 = *ibid.*, p. 94, analysis no. 10, and pl. 11.5) and one was not (Brussels, inv. 11.37.515, the last coin listed above in n. 28). Nearly all of these tetradrachms (as opposed to the *STYLE X* and related specimens) have the 4th-century

The extended left foot of the owl may perhaps be understood as a short-lived detail that was introduced to distinguish the new series of coins from the old. Other changed details – the truncated *alpha* and, on obverses, the more compact and neatly designed ear and helmet ornament – were retained, as the enlarged, three-quarter profile eyes of Athena gave way to eyes in full profile. The new series commenced no later than the 390s, but whether just before or during the early, middle, or later part of the decade is impossible to say. Quickly, possibly even before c.390, the designing of obverses became increasingly naturalistic and delicate, bringing into existence the standard earlier 4th-century obverse styles that are best known from the Lentini find, which from its relatively early date in the century and its minimal amount of obverse die duplication implies that by the 380s at the latest, Athens' tetradrachm coinage was being minted in considerable quantity. One assumes that such quantity continued to expand over the next twenty-five to thirty years until in the *pi*-style recoinage of 353 the coinage was called in and restruck. ^[32]

In order to give a sense of the coinage's scale, I append in Table 1 a preliminary record of the coinage compiled from publications and several unpublished collections. This admittedly incomplete record comes to 146 tetradrachms. From these a quarter of the tetradrachms must be subtracted as being too poorly preserved or photographed for satisfactory obverse die identification. Among the remaining 109 specimens the pattern of low obverse die repetition remains the same as we saw in the Lentini find. Eighty-one identified dies are singletons, known from but a single coin. Only ten are doubletons or higher. When these figures are inserted into the die predictor equation devised by Giles Carter, ^[33] the formula estimates a proba-

type of ear with the *point tragus*, which, on the whole, supports attribution to the mainstream Athenian coinage of the earlier 4th century. Accordingly, of the eight 4th-century owl tetradrachms in the ANS Nahman's hoard (P.G. VAN ALFEN, Two unpublished hoards and other owls from Egypt, *AJN*² 14 (2002), p. 62-63, pl. 13, no. 2-9), five pass as Athenian, while the three that have Athena's ears of the 5th-century type (no. 3, 4 and 9) must be identified as imitations.

[32] There is little that can be said about Athens' coining of fractional denominations in the first half of the 4th century. Sv., pl. 21-43, 60-62, illustrates a few triobols and diobols with the recognizable bold type of Athena obverses; and more good specimens turned up in the lamp hoard of the first half of the century found at Ag. Ioannis Rentis (*IGCH* 89), see KROLL, *op. cit.* [n. 2], p. 256, hoard no. 6. The drachm in this hoard is of 5th-century type and is worn, like the drachms in a later hoard of fractions from Anavyssos 1948 (*IGCH* 135); *ibid.*, hoard no. 7. Apparently, during much or all of the first half of the century, fresh drachms were not minted.

[33] G.F. CARTER, A simplified method for calculating the original number of dies from die link statistics, *ANSMN* 28 (1983), p. 195-206. The resulting die estimates are 423.9 ± 80.8 .

ble original total for the coinage of about 3.7 to 5.5 times the existing die count of 91, that is, roughly between about 340 and 500 dies. For a coinage that spanned some forty or forty-plus years, this allows an average of about seven to twelve obverse tetradrachm dies a year, a number that may seem modest until one looks for other classical Greek civic coinages of this scale and discovers that there are hardly any. In the 4th century Corinth comes closest; over the first half of the century its estimated 246 obverse stater dies give a total of only about five obverse dies *per annum*.^[34] Instead of the negligible coinage that we all thought it was, Athens' tetradrachm coinage from the 390s to 353 now appears to be one of the most voluminous civic coinages of its time, perhaps even the most voluminous.

One may then ask why Xenophon expressed concern about the state of Athens' silver mining industry in his treatise on public revenues (*Poroi*), written in or about 355. His statement (4.28) that investors in the industry had only recently begun to explore for new mine workings does not mean that the industry was just recovering from the Peloponnesian War; rather his point was that, even though the old mines were operating successfully, exploration for new veins of silver needed to be undertaken if the industry were to expand and return to its full, 5th-century potential. Andrew Meadows' calculations for Athenian tetradrachm production in the 440s give a glimpse of how vast that potential was: on Meadows' reckoning the minting of tetradrachms required between 55 and 450 obverse dies a year.^[35] As Xenophon knew, the industry of his own time had a very long way to go before it could reach the almost unbelievable output of the previous century.

Even so, just as the mining industry had recovered and was swiftly expanding within a decade after the Persian occupation of Attica in 480,^[36] there is no reason why it should not have recovered after Athens' defeat in the Peloponnesian War with a similar rapidity. Xenophon (*Poroi*, 4.25) attests that the establishment of the Spartan base at Decelea in 413 took a toll on the slave labor that worked in the mines, but to what extent is un-

[34] Fr. DE CALLATAÏ, *Recueil quantitatif des émissions monétaires archaïques et classiques*, Wetteren 2003, p. 167-168.

[35] Meadows' study, based on the 143 Athenian tetradrachms in the Malayer (Iran) hoard (IGCH 1790) awaits publication. Summary in J.H. KROLL, What about coinage?, in J. MA, N. PAPAZARKADAS & R. PARKER (eds.), *Interpreting the Athenian Empire*, London 2009, p. 198, with n. 12.

[36] The only question seems to be whether the first series of coins to be struck after 480 belong to the middle years of the 470s (so C.G. STARR, *Athenian coinage 480-449 BC*, Oxford 1970, p. 19) or earlier in the decade (so J.H. KAGAN, *Chronology and consequences*, in I. CARRADICE (ed.), *Coinage and administration in the Athenian and Persian empires* (BAR International Series 343), Oxford 1987, p. 22). By the mid 460s, the Athenian mint was striking decadrachms.

clear.^[37] The Athenians' decision in 409 to secure the mining district with forts at Thoricus and Anaphlystus (Xen., *Hell.*, 1.2.1, with *Poroi*, 4.43) implies a determination to continue mining operations during the Decelean War. Since the bronze coinage of 406/5 could only have been issued for internal use, the mining and minting of silver at whatever level possible may very well have continued for external naval expenses down to the end of the Peloponnesian War.^[38] In any event, with the return of peace, the mineshafts, the washeries, and furnaces were still in place. The problem was the need for capital to amass and maintain the necessary amount of slave labor, a difficulty that continued to handicap the industry as late as the 350s (*Poroi*, 4.5). Nevertheless, the Athenians seem to have managed well enough over the first half of the century for sustained mining at a significant level.

It goes without saying that the foregoing discussion has important implications for the history of Athens in the first half of the 4th century. For one thing, it has a critical bearing on the interpretation of the nomothetic law of 375/4 pertaining to the public Certifiers (*dokimastai*) of the city's silver coinage.^[39] Scholars who believed that one purpose of the law was to allow foreign imitations of Athenian coins, if of good silver, to be legally accepted in Attica on the same terms as bonafide Athenian silver coins, have from time to time explained that such foreign coinage was needed in order to supplement the domestic currency that was assumed to be in short supply.^[40] In 388 or 387 the well-off speaker of Lysias 19 (section 11) does refer to a current scarcity of money in the city and asserts that it may prejudice the jury against his case, but whether we accept this at his word or question it as an exaggerating rhetorical *topos* for gaining sympathy, it belongs more than a decade before the nomothetic law in question. By effectively removing any possibility that Athens might have been expe-

[37] STRAUSS, *op. cit.* [n. 1], p. 45-46, with n. 20, has a sensible discussion. S. LAUFFER, *Die Bergwerkssklaven von Laureion*, part 2, *Akademie der Wissenschaften und der Literatur, Abhandlungen der geistes- und sozialwissenschaftlichen Klasse*, 1956, no. 11, p. 978-991, was convinced that the mine slaves were constrained from joining the mass desertion of Athenian slaves to Decelea. But Strauss counters that many probably escaped before Laurion was fortified in 409 and that the emancipation of slaves in 406 to help man the fleet before Arginusae (Xen., *Hell.*, 1.6-24, with *Poroi* 4.42) might have also reduced their number.

[38] Likewise, the issuing of the emergency gold for external obligations should not lead us to assume that minting at Laurion had ceased. Athens' situation was desperate primarily because her reserves in silver had run out at a time that income from her *arche* had become sporadic.

[39] P.J. RHODES & R. OSBORNE, *Greek Historical Inscriptions 404-324 BC*, Oxford 2003, p. 112-118, no. 25.

[40] E.g., R.S. STROUD, An Athenian law on Silver Coinage, *Hesperia* 43 (1974), p. 170-171, 180.

riencing a shortage of coin in the 370s, the hoard and die evidence presented above eliminates this *rationale* for the alleged legalizing of foreign currency use in the city. On the contrary, there are very good reasons for understanding that the thrust of the law was to exclude pseudo-Athenian coins from being absorbed into the pool of the officially circulating state currency, which in trade had to be accepted under force of the legal penalties specified in the law.^[41] At the time of the law Athens had plenty of excellent silver money of her own. But were it not for those 4th-century tetradrachms that had been removed from Attica prior to 353, ultimately to be found in hoards overseas, hardly any of it would be known today.

[41] These were advanced especially by T.V. BUTTREY, The Athenian currency law of 375/374 BC, in O. MØRKHOLM & N. WAGGONER (eds.), *Greek numismatics and archaeology, Essays in honor of Margaret Thompson*, Wetteren 1979, p. 33–45, and More on the Athenian coinage law of 375/4 BC, *Quaderni Ticinesi* 10 (1981), p. 71–94; with O. MØRKHOLM, Some reflections on the production and use of coinage in ancient Greece, *Historia* 31 (1982), p. 293–296. But the sentence of the law that concerns the disposal of “foreign silver with the same type as the Attic” (lines 9–13) has made it hard for a number of scholars to accept this position (see D. TAI ENGEN, “Ancient greenbacks”: Athenian owls, the law of Nikophon, and the Greek economy, *Historia* 54 (2005), p. 371–381). The sentence specifies that such imitations were to be returned to their owners, unless they had a bronze or lead core or were made of debased metal, in which case the imitations were to be cut through and confiscated. Since foreign imitations made of good silver were not confiscated, nor cut, nor even marked, but were simply returned, these scholars have assumed that, by returning such a coin, the *dokimastes* implicitly certified it as *dokimon*, i.e., officially valid with state-guaranteed value and acceptability. What needs to be appreciated, however, is that, in the exclusive, or monopolistic, or “closed” currency system operated by Greek states that produced their own currency, any “foreign” (*xenikon*) coin is, *ipso facto*, *adokimon*, i.e. legally invalid and unacceptable – a principle that follows from the opening clause of the law: “Attic currency is to be accepted whenever it is found to be silver and bears the official stamp”. (For the monopolistic character of polis coinages, see M. CRAWFORD, *La moneta in Grecia e a Roma*, Roma & Bari 1982, chapter II. For the legal categories of *dokimon/adokimon* currency at Athens with reference to the 353 restriking, see KROLL, *op. cit.* [n. 2], p. 230–233, 237 and 239). The law allows imitations that were plated or debased to be mutilated and confiscated because they were worthless; but the State could not take a coin of genuine silver without compensating the owner inasmuch as the coin was still worth at least its weight in bullion. The owner was left to dispose of it on his own. Since it had already been suspected and refused by one merchant, it was likely to be questioned and refused again; hence the owner’s best option was to take it to the *trapezitai* and sell it for the best price that he could get, a price that was unlikely to be less than about 90 per cent of its value were it of authentic Athenian mintage. The imitation need not have been cut nor counter-stamped if “the *dokimasia* was an on-the-spot judgment intended to settle tendentious disputes” (BUTTREY, *supra*, p. 37). But in any event, defacing the imitation would have greatly reduced its value for sale at the table of any moneychanger, who would have known that the imitation could be re-introduced in trade abroad. Counter-stamping, on the other hand, although commonly used to revalidate or revalue coins, was never, to my knowledge, used to invalidate them.

Table 1 – Preliminary Census of Early to Mid Fourth-Century Athenian Tetradrachms *

A = Number of specimens
B = Number of specimens allowing identification of obverse die
C = Number of additional obverse dies

	A	B	C
SPECIMENS WITH KNOWN PROVENIENCES			
<i>Athens – Agora Excavations</i>			
a. N 12175 : KROLL, <i>loc. cit.</i> [n. 2], fig. 4:a	1	1	1
b. N 74094 [n. 5], unpublished	1	?	
<i>Sicilian hoards</i>			
a. Contessa (IGCH 2119), pl. IV·3-5	3	3	3
b. Manfria (IGCH 2121), pl. III·7-12, IV·1-2	8	2	2
c. Lentini (IGCH 2117), pl. I·1-12, II·1-7	19	19	18
d. Licata (IGCH 2130), pl. IV·8-9	2	1	1
e. Leonforte (IGCH 2133), unpublished, very worn	1	0	0
f. Catania region : <i>La circolazione della moneta ateniese in Sicilia e in Magna Grecia</i> , Roma 1969, pl. XIII·3	1	0	0
<i>Egyptian hoards</i>			
a. Fayum (n. 23 above)	1	?	
b. Tell el-Maskhuta (IGCH 1649), FLAMENT 2007B, pl. II·2 and II·5	2	2	2
c. Nahman's, VAN ALFEN, <i>AJN</i> 2002, pl. 13·2, 5-8	5	4	3
d. Tell el-Athrib (IGCH 1663), Sv. pl. 26·2-19; NICOLET-PIERRE, <i>ArchEph</i> 2001, pl. 4 and 5, no. 42-69	28	18	16

* This listing does not pretend to be exhaustive. I have not canvassed any unpublished collections other than the few cited. Secondly and more importantly, my study of obverse dies has relied entirely on photographs, which because of the lighting can sometimes distort details and often do not reveal in full the precise configuration of the curved lines that make up the floral terminal of the helmet ornament. This configuration is one of the most diagnostic details of any given die, and I have noted a number of instances where two coins might seem to be from the same die were it not for a distinct variation in two or three lines in the ornament. If one were to redo the die study from plaster casts, I suspect that in some cases two coins that appeared from photos to have been struck from different dies would prove to be from a single die, resulting in a die total that would be slightly less than recorded here. For the present, however, I believe it has been better to err on the side of caution by not assigning two or more coins to the same die unless the attribution appeared beyond reasonable doubt. The purpose of this exercise, in any case, was not to give absolute and final die figures, but only to provide a sense of scale. I have omitted a few tetradrachms that can be seriously suspected of being foreign imitations (e.g., above [n. 31]).

Syrian and Levantine hoards

a. Syria 1989 (CH VIII.158), VAN ALFEN, <i>AJN</i> 2002, pl. 3-48	1	1	1
b. Owl/bullion hoard, VAN ALFEN, <i>AJN</i> 2004/5, pl. 8-29	1	1	1
c. ANS Near East hoard, ANDERSON & VAN ALFEN, <i>AJN</i> 2008, pl. 55-56, nos. 104, 106-107, 110-114, 119	9	0	0

OTHER SPECIMENS, PUBLISHED

a. Sv. pl. 19-2, 4-5, 13-21, 24-26, 31-32, 35, and pl. 20-1 (various collections, incl. Athens, Berlin, Dresden, London, Paris, Tübingen, Vienna, and Vatican)	19	19	9*
b. SNG ANS, Berry coll., no. 693	1	1	1
c. SNG Cambridge, Fitzwilliam, no. 2095	1	1	1
d. SNG Paris, Delepierre coll., no. 1470, 1472	2	2	2
e. SNG Munich, Athens, no. 90 (same A ₇ die as Delepierre, no. 1472)	1	1	0
f. SNG Stockholm, no. 357	1	1	1
g. BMC, <i>Attica</i> , pl. v-5	1	1	1
h. British Museum, NC ⁴ XVII (1917), pl. I-15	1	1	1
i. Oxford: KRAAY, <i>Coins of ancient Athens</i> , Newcastle upon Tyne 1968, pl. IV-5	1	1	1
j. Oxford: KRAAY, <i>Archaic and Classical Greek Coins</i> , London 1976, pl. 11-200	1	1	1
k. Cambridge (MA): MILDENBERG-HURTER (eds.), <i>A.S. Dewing collection</i> , New York 1985, no. 1625	1	1	1
l. Boston: BRETT, <i>Catalogue of Greek coins</i> , Boston 1955, no. 1093	1	?	
m. FORRER, <i>The Weber collection</i> , London 1924, no. 3473	1	1	1
n. <i>Collection de Nanteuil</i> , Paris 1925, no. 923	1	1	1
o. Lanz, Munich, Auction cat. 117, 24 November 2003, pl. 13, nos. 259-260	2	2	2
p. Specimens in other recent sales catalogues, illustrated in FLAMENT 2007B, pl. II-1, 3, 4, 6, 8, and III-1, 4-7	10	10	9

UNPUBLISHED

a. Alpha Bank collection, Athens	1	1	1
b. British Museum (one with same A ₇ die as Lentini hoard, pl. II-1)	4	3	2
c. ANS, all but one from E.T. Newell and H. Miller coll.	13	9	8

TOTALS 146 109 91

* A₇ die sharing in SVORONOS: a. Four coins from one die (pl. 19-18, 19, 24, and pl. 20-1; the die is counted in the tally of the Tell el-Athrib hoard, which has a fifth specimen (Sv. pl. 19-18 = NICOLET-PIERRE, no. 69). b. Three coins from another die (pl. 19-13, 14 and 25). c. Two from a third die (pl. 19-31 and 32, the last now in Oxford); this last die was also used for two unpublished tetradrachms at the ANS.

PLATE I – LENTINI 1957 HOARD (JGCH 2117)

Photos on file at ANS – except for plates I-1 and II-1, 5 and 7, the coins are dispersed



PLATE II – LENTINI 1957 HOARD (CONT.)



II-1 – ANS 1959-137-4



II-2



II-3



II-4



II-5 – ANS 1959-137-3



II-6



II-7 – ANS 1959-137-2



MANFRIA 1948 HOARD (IGCH 2121)

Photos courtesy of Museo Archeologico Regionale di Gela



II-8



II-9



II-10



II-11



PLATE III – MANFRIA 1948 HOARD (CONT.)



III.1



III·2



III·3



III·4



III·5



III.6



III·7



III.8



III·9



III·10



III. 11



III·12



PLATE IV – MANFRIA 1948 HOARD (CONT.)



IV.1

IV.2

CONTESSA 1888 HOARD (IGCH 2119)



IV.3 – Reproduced from *Notize della Scavi 1888*, pl. xvi.20

IV.4 – Reproduced from *La circolazione della moneta ateniese in Sicilia (Roma 1969)*, pl. III.7



IV.5 – Photo courtesy of Museo Archeologico Regionale di Palermo

LICATA 1926 HOARD (IGCH 2130)

Photos courtesy of Museo Archeologico Regionale di Siracusa



IV.6

IV.7



IV.8

IV.9

PLATE V – TELL EL-ATHRIB HOARD (EGYPT, IGCH 1663)



v.1 – Reproduced
from Sv., pl. 26:8



v.2 – Reproduced
from Sv., pl. 26:9



UNKNOWN PROVENIENCES



v.3 – Paris; reproduced
from Sv., pl. 19:5



v.4 – “Commerce”; reproduced
from Sv., pl. 19:16



REFERENCES

- FLAMENT 2001 = Chr. FLAMENT, À propos des styles d’imitations athéniennes définis par T.V. Buttrey, *RBN* CXLVII, p. 39-50, pl. I-II.
- FLAMENT 2003 = Chr. FLAMENT, Imitations athéniennes ou monnaies authentiques ? Nouvelles considérations sur quelques chouettes athéniennes habituellement identifiées comme imitations, *RBN* CXLIX, p. 1-10.
- FLAMENT 2007A = Chr. FLAMENT, *Le monnayage en argent d’Athènes. De l’époque archaïque à l’époque hellénistique (c.550-c.40 av. J.-C.)*, Louvain-la-Neuve.
- FLAMENT 2007B = Chr. FLAMENT, Quelques considérations sur les monnaies athéniennes émises au IV^e s., *Quaderni Ticinesi* 36, p. 91-105, pl. I-III.
- FLAMENT & MARCHETTI 2004 = Chr. FLAMENT & P. MARCHETTI, Analysis of ancient silver coins, *Nuclear Instruments and Methods in Physics Research B* 226, p. 179-184.
- Sv. = J.N. SVORONOS, *Les monnaies d’Athènes*, completed by B. Pick, 1923/26 Munich; reprint, translated with additions, as *Corpus of the Ancient Coins of Athens*, Chicago 1975.