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**METALLURGICAL ANALYSIS OF THE PERSECUTION
“COINAGE” OF MAXIMINUS II DAIA
AND ITS SIGNIFICANCE**

Abstract: A small series of metal coins or tokens were issued in Antioch, Nicomedia, and Alexandria, supposedly in 312 AD, under the auspices of Maximinus II Daia. They have been presumed to be coins issued to promote his persecution of Christians in 312 AD. All other coinage of the time was billon, a mostly copper alloy containing small, but monetarily significant, amounts of silver. The composition of the alloy of these coins at present is unknown, and if they do not contain silver these objects may not have been a coinage but rather tokens issued in relation to the persecution. Nine examples of these objects were metallurgically analyzed to determine the composition of the alloy to better characterize these objects.

Keywords: Maximinus II Daia, persecution coinage, metallurgy, civic coinage, Christian

Introduction

Van Heesch¹ studied what he considered to be a small and coherent group of coins issued in Alexandria, Nicomedia, and Antioch. Examples of the types are illustrated (Fig 1). He concluded the following:

1. They were issued in 312 AD.
2. They were issued as anti-Christian propaganda.
3. They were a fractional currency expressing Maximinus' desire to persecute Christians after Galerius issued his edict of toleration in 311 AD.
4. That they represented a brief return to a civic coinage.

Over time they have become commonly referred to as a “persecution coinage” and have been considered due to Maximinus Daia's² rescript of April

¹ J.Van Heesch, *The Last Civic Coinages and the Religious Policy of Maximinus Daza (AD 312)*, *The Numismatic Chronicle*, 153, (United Kingdom 1993), 65-75.

² For the rest of this work his name will be shortened to Maximinus, and it is understood that this name does not refer to Maximinus Thrax, who ruled 235-238 AD.

6, 312 AD³ renewing Christian persecutions. The author is not convinced that all of these issues form a coherent group and suspects that the rarest ones might not be coins at all. Evidence to support this will be presented. These items will henceforth be described as “civic issues” rather than a “persecution coinage”.

Additionally, at the time of Van Heesch’s study metallurgical analyses had not been done on these issues so it was unknown whether they were made of bronze or billon. Since the compositions of the alloys of these issues may be important and help in their further evaluation, this study was performed to determine their compositions, especially their silver contents.

Study sample

Nine of these “civic issues” were obtained from the trade and form the study sample (Table 1, Figure 2). Examples from all three mints which issued them, Antioch, Nicomedia, and Alexandria, were studied. The majority (7) were from Antioch (one of Van Heesch type 2 and six of Van Heesch type 3) as these issues are much more common than those from Nicomedia and Alexandria and are therefore less expensive to acquire and are much more amenable to the mildly destructive analyses performed on all but one of the nine coins in this study. Nicomedia and Alexandria were represented by single examples each, and comprise the study sub-sample of the much rarer types, which will be described more later. Although in an ideal situation more examples of the rarer types (Van Heesch 1 & 4-9) would have been studied, the cost and unavailability of these rare issues precluded the study of more of them. The iconographic coherence of these rarer types (to be discussed) however makes it very likely they all share the same composition thus allowing the conclusions of this study that will subsequently be made. Whenever possible low grade but still identifiable examples were used. In addition a total of five nummi⁴ from the three mints which struck these civic issues, three contemporaneous with and two issued just after these civic issues were struck, were also compositionally analyzed to form a basis of comparison with the results from the persecution issues (Table 3, Figure 3).

Method of metallurgical analysis and study design

Metallurgical analysis was performed in the following manner with a Quanta electron microscope upon eight of the nine civic issues, issues 1-8, Figure 2 (but excluding the issue from Nicomedia, issue 9, Figure 2) as well as the five comparison nummi⁵, Figure 3. These issues were mounted in acrylic

³ J. Mitchell, *Maximinus and the Christians in AD 312: A New Latin Inscription*, *Journal of Roman Studies*, 78, Cambridge 1988, 114.

⁴ The currently preferred names for the copper alloy coinage of this period is *nummus* (singular) and *nummi* (plural).

⁵ The Michigan Center for Materials Characterization, the University of Michigan, Ann Arbor, Michigan, USA, is acknowledged for allowing the author to use a self-funded research account to fund use of their electron microscope for this study.

resin ⁶ and an edge of each was smoothed on a polishing wheel with progressively smaller abrasives, first using 320 grit sandpaper and then progressively smaller diamond suspension grits, ranging from 9 microns down to 50 nanometers in average size. This resulted in a shiny surface which was smooth to at least 2000x magnification. Each coin surface was abraded through the surface patina to a total abrasion depth of about one millimeter, well into virgin alloy since the patina layers were thin, substantially less than 0.5 mm. The internal alloy of these coins was analyzed, rather than the surfaces, so as to avoid erroneous results induced by surface corrosion. The edge of the rare Nicomedian example (issue #9, Tables 1&2, Figure 2) was not smoothed in this manner owing to its rarity and value. Only its surface was analyzed for reasons to be discussed shortly.

The center points of the internal alloy, free from surface corrosion, of all examples except the Nicomedian issue were then analyzed with X-ray energy dispersive spectroscopy (XEDS) ⁷ using the Quanta unit. Only the unaltered surface patina in a field of the Nicomedian coin underwent XEDS. This is acceptable if the surface silver concentration is negligible, because the surfaces of billon coins which have undergone environmental oxidation (patination) virtually always undergo surface enrichment ⁸, which results in a higher concentration of the elements less prone to oxidation than copper (most importantly silver in this study) at the surface than in the internal metal. Therefore if the surface silver concentration of the Nicomedian coin was negligible, it had to be negligible internally as well.

Late Roman billon coinage alloy was composed mostly of copper, with smaller amounts of silver, tin, and lead, as determined from many Roman coins destructively and chemically analyzed by Cope ⁹; however, he did not analyze these civic issues, thus showing the need for this study. Other metals were also present, usually in minute quantities, but these were unintentional impurities in Roman times. Therefore these minute quantities were ignored and the compositions of these civic issues are reported in terms of copper, silver, tin, and lead, with the results given in weight percents.

⁶ Quickmount self-setting resin, Fulton Metallurgical Products Corp., P. O. Box 427, Saxonburg, PA 16056, 724-898-3600. Equal parts of liquid and powder components were mixed and the coins suspended in the solution, which hardened in about thirty minutes.

⁷ A detailed explanation of the technique is beyond the scope of this study. In short, a beam of electrons from a gallium source bombarded the shiny surface of each coin and caused the emission of X-ray photons, with characteristic energies for each metal. The energies of these X-rays were detected and the numbers of X-ray photons counted, and through a series of complex calculations the concentrations of each element in the alloy were determined and expressed in weight percents. Like XRF, XEDS only measures the composition of the superficial aspect of an alloy. This is why the samples were smoothed to reveal internal metal.

⁸ L. Cope, E. Hall, D. Metcalf (eds.), *Methods of Chemical and Metallurgical Investigation of Ancient Coinage RNS Special Publication No. 8*, London 1972, 265; also K. Butcher and M. Ponting, *The Metallurgy of Roman Silver Coinage*, Cambridge 2014, 107.

⁹ L. Cope, C. King, J. Northover, T. Clay, *Metal Analyses of Roman Coins Minted Under the Empire*, London 1997, 31-55.

Van Heesch's original study listed the numbers of issues in each of his classes 1-9 available to him. Since that time many more examples of the more common types have come to light. To assess whether an updated number of these issues might suggest that they actually self-divide into two different classes, examples of issues which have come to light since his study were sought. This was done by consulting the professional version of the digital database Coin Archives.¹⁰

Results

The data in Table 2 show that in all eight civic issues with smoothed edges, issues 1-8, Fig 2, the silver concentration of the bulk internal alloy was no greater than approximately 0.4%. This is a very tiny amount and does not represent the intentional addition of silver to the alloy by the Romans. An amount this small is an unintentional "impurity". Cope has shown that very low concentrations of silver were even present in first century Roman imperial bronzes, which did not contain intentionally added silver.¹¹

Analysis of the surface of the one issue from Nicomedia, coin 9, Fig 2, returned a value of 0.5% at the surface, Table 2. Since this value could not be higher than that of the silver concentration in the internal alloy, and was almost certainly higher due to environmental surface silver enrichment, this value also indicates a negligible and unintended amount of silver in the alloy of this coin.

The silver concentrations in the five comparison coins of Constantine I and Licinius I, three issued just before or at the same time as (coins a-c, Figure 3 and Table 3), and two just after the issuance of these persecution issues (coins d & e, Figure 3 and Table 3) are comparable to those of similar coins as determined by Cope using destructive chemical analyses.¹² These silver concentrations are substantially higher than those in the persecution issues, generally being in the 1.5-3% range. These results showing coherence with Cope's results is an indication of the validity of the analysis technique used in this study.

The Coin Archives search uncovered 212 additional examples of civic issues, which when added to the original 171 issues known to Van Heesch, results in Table 4. Of note is that Van Heesch types 2 and 3, with totals of 114 and 191, respectively, far outnumber the seven other types, with a combined total of only 49 for the remaining seven types.

¹⁰ The professional version of Coin Archives (www.coinarchives.com) is a searchable digital internet database containing the auction listings for nearly all major ancient coin auction firms for approximately the last 24 years. Its database commenced approximately five years after Van Heesch's study was published. Since the database is composed of auctions from major dealers who usually feature coins of high, or relatively high, value the sample under-represents the common Antiochene issues relative to the rarer issues.

¹¹ *Metal Analyses of Roman Coins Minted Under the Empire* / op.cit, 19 & 20.

¹² *Metal Analyses of Roman Coins Minted Under the Empire* / op.cit, 39, 42, & 43.

Discussion

This study shows that these civic issues lacked monetary amounts of silver¹³ and thus would have had a shiny copper-colored appearance after production. In 312 AD, all other contemporaneously issued copper alloy coinage was billon and had a bright silvered surface when first issued¹⁴ due to a thin coating of silver on the surface typical of the billon alloy coinage of this period. Therefore these civic issues would have looked very dissimilar to the contemporaneously made coinage and would have stood out prominently compared to all other bronze or billon coinage of the time.

Now that more material has come to light since Van Heesch's study, it can be seen that these civic issues seem to divide themselves into two distinctly different issues: the first being the two common types from Antioch (Van Heesch classes 2 and 3) and the second being the seven rare types (Van Heesch types 1 & 4-9). These separating factors are:

1. For Van Heesch types 2 and 3, there are now at least 114 and 191 examples, respectively, and only 49 examples total for the other seven rarer classes combined (Table 4). And at the beginning this discrepancy may be even greater as Coin Archives listings are weighted towards the rarer and thus more expensive items, disproportionately including these more expensive issues and thus under-sampling the more common and therefore cheaper Antiochene issues (Van Heesch types 2 and 3). These types can no longer be considered rare or even scarce. A survey of recent auction results showed an average price ratio of 3:1 for the seven rare types combined as compared to the common two Antioch types¹⁵.

2. The more common Antiochene issues were struck in up to ten officinae, while the rare issues were struck in only one to three officinae¹⁶, providing further evidence that the two Antiochene issues were struck in far greater quantities than the seven rare types.

3. The common Antiochene issues depict seated figures on the obverse which are not necessarily city gods and likely represent important local statues, the Tyche erected by Eutychides, the Apollo by Bryaxis of Athens, and possibly

¹³ Although only two of the less common types were studied due to their rarity, it is believed that the lack of monetary silver in these two issues can be extrapolated to the other rarer issues due to the commonality of the types.

¹⁴ It would have worn away with time, but initially the surface would have had a bright shiny silver appearance.

¹⁵ A survey of recent auction prices in Coin Archives reveals the following: for the most recent twenty issues of Van Heesch types 2 & 3, the average auction price was \$74; for the most recent ten issues (during approximately the same time interval as the twenty) of the remaining seven Van Heesch types the average auction price was \$228, resulting in a price ratio of approximately 3:1 for the two groups.

¹⁶ *The Last Civic Coinages and the Religious Policy of Maximinus Daza (AD 312)* / op.cit, 66 & 67.

the Zeus Nikephoros of the temple of Apollo at Daphne ¹⁷ (Fig 1, types VH2 and VH3). The rare issues depict head and neck images of city gods (Nicomedia and Alexandria) and the city genius (Antioch).

4. As Van Heesch noted, the mintmark of the Nicomedia issue, OPA (Van Heesch type 1), and the mintmarks of the Alexandrian issues, (MS and SM), are highly unusual for bronze or billon coins from those mints during the time in question.¹⁸

For these reasons it is possible, perhaps even likely, that these common civic issues, Van Heesch types 2&3, were not issued in 312 by Maximinus and do not refer to the persecutions, and were perhaps issued earlier when the empire was more stable, when other types of silver-lacking fractional coinages were issued, and for which a lack of a silver content would not have been considered unusual. If they had been issued in 312 AD, it seems curious that Maximinus would have issued any coins, even fractional ones, that would be easily seen to lack silver while his rivals, Constantine I and Licinius I, issued only silver-containing billon coins for their non-precious metal coins. Such non-argentiferous coins would be easily seen by the populace to be a fiduciary coinage contrasting markedly with the billon coinage of Constantine I and Licinius I. At a time when three emperors were competing for control of the entire empire, a lack of silver in any portion of the coinage might have been seen as a “loss of face” compared to the other two emperors at a time when image was all-important to not only the populace, but especially the military. This issue invites further study.

The second group of these civic issues is now considered. They are much rarer than the common types and have a different iconography more directly promoting the pagan gods, going so far as to declare DEAE SANC CERERI on the single issue from Nicomedia (type VH 1, Fig 1), and DEO SARAPIDI, DEO SANCTO SARAPIDI, SANCTO NILO, and DEO SANCTO NILO on the issues from Alexandria ¹⁹ (types 6-9, Figure 1), or the city Genius of Antioch, GENIO CIVITATIS (types 4 & 5, Figure 1). Although it cannot be proven that these issues were not a fractional currency, their even more pagan references and their rarity compared to the common Antiochene issues suggest that they may have had a different, non-coinage purpose. They could have been distributed by city officials during public ceremonies as tangible evidence of the renewed persecutions. And if used in this way, large numbers would not have been needed. Furthermore, in the same year these rarer issues were struck (312 AD), Maximinus removed the tax burden from pagans but left it intact for Christians in his rescript of 312 AD ²⁰. It is possible that these issues were tokens to be presented by pagans at the time of tax collection to prove they were not to pay the poll tax. Sincere Christians would not in good conscience have used such tokens in this manner and therefore would not have escaped this tax.

¹⁷ D. Vagi, *Coinage of the Roman Empire*, Chicago 1999, Vol. II, 516.

¹⁸ *The Last Civic Coinages and the Religious Policy of Maximinus Daza (AD 312)* / op.cit, 68.

¹⁹ The single rare Antioch issue is of two types, one with the obverse legend GENIO CIVITATIS and the other exactly like the type with this legend but which is anepigraphic.

²⁰ *Maximinus and the Christians in AD 312: A New Latin Inscription*, / op.cit 122-124.

It is also possible that these issues were tokens for the populace to present at a ceremony or official meeting to prove they were pagans and not Christians, directly analogous to the papyrus libelli ²¹ of the Decian persecution of Christians in 250 AD.

Conclusions

The civic issues described by Van Heesch seem to divide themselves into two distinctly different classes. The much more common Antiochene issues were likely to have been a fractional currency produced at a time when non-argentiferous bronze coinage was accepted by the populace, but may not have been issued in 312 AD, may not have promoted the persecution of Christians, and may have been issued to celebrate another, earlier or later, event. It is possible the much rarer issues may have been a very small or soon-aborted fractional currency, but may instead have been directly used in the persecution of Christians in a non-coinage way. They could have been used as a token to proclaim the holder was not a Christian in a public way, similar to the libelli of the Decian persecution in the prior century, or as a token to be presented by the pagans to escape the payment of poll taxes.

Table 1. Civic issues of this study which underwent metallurgical analyses.²²

| | Van Heesch | | | |
|------|---------------|------------|---------|--------------------------|
| Coin | Attribution | Mint | Wt. (g) | Min x max (mm) |
| 1 | Plate 11, #3 | Antioch | 1.27 | 16.4 x 17.1 |
| 2 | Plate 11, #2 | Antioch | 0.70 | 12.6 x 15.5 (chipped) |
| 3 | Plate 11, #3 | Antioch | 1.43 | 16.3 x 16.8 |
| 4 | Plate 11, #3 | Antioch | 1.45 | 15.1 x 15.5 |
| 5 | Plate 11, #3 | Antioch | 1.33 | 14.8 x 15.1 |
| 6 | Plate 11, #3 | Antioch | 2.24 | 15.9 x 16.5 |
| 7 | Plate 11, #3 | Antioch | 1.52 | 15.2 x 15.7 |
| 8 | Plate 11, #10 | Alexandria | 1.00 | 14.3 x 15.2 |
| 9 | Plate 11, #1 | Nicomedia | 1.47 | 16.1 x 16.2 |

²¹ A labellum was a papyrus document written by a scribe and performed in the presence of witnesses wherein a citizen took an oath that he was not Christian.

²² The Last Civic Coinages and the Religious Policy of Maximinus Daza (AD 312) / op.cit, 66 & 67.

- Coin 1,3-7: OBV.: Antioch seated facing on rock, Orontes swimming below, GENIO ANTIOCHENI. REV.: Apollo standing left, patera in right hand and lyre in left, APOLLONI SANCTO, SMA in exergue.
- Coin 2: OBV.: Jupiter seated on throne left, holding a globe in his right hand and a vertical scepter in his left, IOVI CONSERVATORI. REV.: Victory advancing left, holding a wreath in her right hand and a palm in her left, VICTORIA AVGG, ANT in exergue.
- Coin 8: OBV.: Head of Serapis with modius right, DEO SANCTO SARAPIDI. REV.: Nilus reclining left, holding a reed in his right hand and cradling a cornucopia in his left arm, DEO SANCTO NILO, ALE in exergue.
- Coin 9: OBV.: Veiled and diademed bust of Ceres left, holding corn ears in her hand, DEAE SANC CERERI. REV.: Fortuna with rudder and cornucopia, standing left, GEN CIVIT NICOM, OPA in exergue.

Table 2. Compositions of the nine Maximinus persecution coins in this study ^{23 24 25}

| Coin | %Cu | %Ag | %Sn | %Pb |
|------|-------|------|------|------|
| 1 | 90.63 | 0.39 | 5.72 | 3.27 |
| 2 | 87.26 | 0.16 | 6.97 | 5.61 |
| 3 | 91.59 | 0.31 | 2.39 | 5.71 |
| 4 | 94.60 | 0.15 | 2.37 | 2.88 |
| 5 | 90.26 | 0.17 | 3.09 | 6.48 |
| 6 | 93.02 | 0.15 | 2.70 | 4.13 |
| 7 | 95.94 | 0.09 | 2.23 | 1.74 |
| 8 | 97.74 | 0.40 | 0.55 | 1.31 |

²³ The results are expressed as weight percents.

²⁴ Please note the following regarding the compositions: Although the analytic software of our electron microscope reports the compositions to two decimal places, the experimental uncertainty of the method does not actually support such accuracy. It is most appropriate to round the compositions to the nearest half percent. For example, a silver composition of 0.15% (coin 9650) is most appropriately considered to be 0.0%, while a silver composition of 0.39% (coin 9178) should be rounded to 0.5%. While at first glance this might seem to indicate our detection method is not very accurate since non-destructive measurements in other studies may have been reported to two decimal places, it is highly unlikely that any non-destructive method can actually achieve two decimal place accuracy, for reasons beyond the scope of this work.

²⁵ Cu is the chemical symbol for copper, Ag for silver, Sn for tin, and Pb for lead.

| | | | | |
|---|-------|------|------|------|
| 9 | 95.95 | 0.50 | 1.15 | 2.40 |
|---|-------|------|------|------|

Table 3. Compositions of Billon Coins Just Before and After Maximinus Persecution Coins^{26 27}

| Coin | Attribution | Mint | Date of Issue | Composition in Weight percent | | | |
|------|-------------|------------|---------------|-------------------------------|------|------|------|
| | | | | %Cu | %Ag | %Sn | %Pb |
| a | RIC VI 164b | Antioch | 312 AD | 92.85 | 2.27 | 2.22 | 2.66 |
| b | RIC VI:77b | Nicomedia | 312 AD | 92.54 | 3.00 | 2.13 | 2.33 |
| c | RIC VI:160b | Alexandria | 312-313 AD | 92.95 | 1.72 | 2.70 | 2.64 |
| d | RIC VII:7 | Antioch | 313-314 AD | 92.28 | 2.68 | 2.28 | 2.77 |
| e | RIC VII:13 | Nicomedia | 313-317 AD | 93.80 | 1.39 | 1.92 | 2.90 |

Table 4. Updated numbers of civic issues for each of Van Heesch types 1-9.

| Van Heesch type | # of Van Heesch examples | # of Coin Archives examples | Total # of examples |
|-----------------|--------------------------|-----------------------------|---------------------|
| 1 | 4 | 11 | 15 |
| 2 | 46 | 68 | 114 |
| 3 | 96 | 95 | 191 |
| 4 | 2 | 10 | 12 |
| 5 | 2 | 10 | 12 |
| 6 | 10 | 15 | 25 |
| 7 | 2 | 0 | 2 |
| 8 | 6 | 3 | 9 |
| 9 | 3 | 0 | 3 |

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МЕТАЛУРШКА АНАЛИЗА НОВЧАРСТВА „ПРОГОНА“ МАКСИМИНА II
ДАЈЕ И ЊЕН ЗНАЧАЈ

Такозвано новчарство „прогона“ из времена Максимиана Даје састоји се из девет различитих типова који варирају од ретких до уобичајених. Наводно су отковани 312. године (н.е.) и анализирани су од стране Ван Хеша који је један од најпоузданијих аутора у вези са овом темом. Уколико је реч о фракционој валути, имали су четврт или половину нумуса. Нумус је садржао изузетно ниску деноминацију бронзаног новца тог

²⁶ These coins are illustrated in Figure 3.

²⁷ RIC VI: Standard abbreviation for Roman Imperial Coinage, Volume VI: R. Sutherland, C. Carson, The Roman Imperial Coinage, Vol. VI, From Diocletian's reform to the death of Maximinus, London, 1967.

времена и садржао је од 2 до 5 процената сребра. Састав овог новца није раније одређиван. Ако новац не садржи сребро доводи се у питање да ли је откован 321. године или не из два разлога : 1) новац откован 312. године или око 321. године садржао је сребро 2) после 312. године није било нумуса. Испитивања су показала да је новац садржи мало сребра ($\leq 0.5\%$) али и нечистоћа које нису биле типичне за римске ковнице и њихову технологију тога доба. Новац о којем је реч углавном садржи представе Антиоха, Тихе, Аполона и Зевса, што указује да није било повезаности са хришћанским контекстом. Није искључено да је овај новац коришћен и као врста жетона које је користио Максимин за време прогона хришћана, дакле коришћен је за време неке церемоније налик *libelli* за време Децијевог прогона хришћана 250. године.



Fig. 2. Civic coins in the study sample. Coin numbers match those of Tables 1 & 2. Coins 1 and 3-7 are Van Heesch type 3; coin 2 is Van Heesch type 2; coin 8 is Van Heesch type 6; coin 9 is Van Heesch type 1.



Type 7 is very rare and an image is not available. It is the same type as VH6, but smaller. See description in heading, VH7

Type 7 is very rare and an image is not available. See description in heading,

VH9

Fig 1. The nine types of civic issues described and numbered by Van Heesch, (all images here and elsewhere are neither life-size nor to scale). The designation names are shortened to VH1-VH9. (Types VH1-VH6 range in size from approximately 12-17 mm and weigh approximately 1.4-1.6 g. Types VH7-VH9 are approximately 10.5-13.6 mm and weigh approximately 1.0 g.) VH1 shows Ceres left, DEAE SANC CERERI / Fortuna, GEN CIVIT NICOM / OPA; VH2 shows Jupiter seated left, IOVI CONSERVATORI / Victory advancing left, VICTORIA AVGG / ANT; VH3 shows Antioch seated, GENIO ANTIOCHENI / Apollo, APOLLINI SANCTO / SMA or AMS; VH4 shows bust of Antioch, GENIO CIVITATIS / Apollo, APOLLONI SANCTO / SMA; VH5 is the same as VH4 but is anepigraphic; VH6 shows Sarapis, DEO SANCTO SARAPIDI / Nilus reclining, DEO SANCTO NILO / ALE (sizes ranging from 14.1-17.0 g); VH7 (not illustrated) is the same as VH6, but is smaller at approximately 13 mm and 1.0 g; VH8 shows Sarapis, DEO SARAPIDI / Nilus reclining, SANCTO NILO / ALE; VH9 (not shown) is small, ca. 1.0 g, and shows Sarapis, DEO SARAPIDI / Alexandria reclining, GENIO ALEXAND / SM, MS, or blank. All images courtesy Classical Numismatic Group.



Fig. 3. Coins struck just before or during (a-c) and coins struck just after (d,e) the civic issues. These are described, and their compositional results given, in Table 3.