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## NUMERICAL LETTERS ON SYRIAN COINS: OFFICINA OR SEQUENCE MARKS?

**Abstract** – Coins issued by cities in northern Syria from the late first to early third centuries often bear Greek numerals on their reverses. The meaning of the letters has never been satisfactorily explained. This paper considers some of the competing explanations, and presents a die study of some of the relevant issues.

THIS PAPER DEALS WITH A PHENOMENON OF MARKING SYRIAN PROVINCIAL bronze coins that begins at Antioch in the reign of Domitian, and ends under Caracalla.<sup>[1]</sup> It is found commonly on the so-called 'SC' bronzes struck at Antioch, and on the civic coinage of that city. In the second century, between the reigns of Trajan and Marcus Aurelius, it is also found on civic coins of a number of north Syrian cities: Beroea, Chalcis, Cyrrhus, Doliche, Emesa, Germanicia, Hierapolis, Seleucia Pieria, and Zeugma.

The markings are mostly numbers: A, B, Γ, etc., suggesting that they are numerical sequences.<sup>[2]</sup> Often the sequences are short (some go no higher than 2<sup>[3]</sup>), but others are longer. A few run as high as 14 or 15. Others have sequences but with gaps: 1-10, then 20, at Antioch under Nerva; 1-4, then 8, at Beroea under Trajan. Whether it is significant that in both of these cases the highest letter is double that of the next highest letter cannot be determined, but it might suggest that the sequences were cycles independent of the coinage. It is of course possible that the gaps may one day be filled with the appearance of hitherto unknown specimens, but if so, they must be very rare compared to the other coins in their respective sequences, for which there is ample evidence.

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[1] Thanks to François de Callatay and Johan van Heesch for inviting me to participate in the *Marking Coin Issues* conference and giving me the opportunity to revisit the question of the numerical letters, and to various scholars who helped me gather information: Amelia Dowler (*British Museum*); Michel Amandry (*Cabinet des Médailles, BNF, Paris*); Ute Wartenberg and Andrew Meadows (*American Numismatic Society*); Christopher Howgego and Volker Heuchert (*Ashmolean Museum, Oxford*); Adrian Popescu (*Fitzwilliam Museum, Cambridge*); Johan van Heesch (*Penningkabinet, KBR, Brussels*). Thanks also to Bernhard Woytek not only for his rewarding discussion of the matter of *officinae* but also for providing copies of material from the Vienna card files, which provided welcome additional material.

[2] As ECKHEL (1828, p. 300) pointed out, they must be numbers, because they include the *episemon* or *stigma* (Ϛ).

[3] Two cities, Doliche and Germanicia, have only the letter A: CRS, p. 477, nos. 2-3; p. 478, no. 1.

There are also anomalous numbers and letters which are harder to fit into a sequence: ΒΔ, ΓΑ and Χ under Trajan at Antioch (CRS p. 357, 226-228); ΚΕ under Trajan and Hadrian at Chalcis (CRS p. 436, nos. 5, 10; p. 437, nos. 16-17). The latter is taken to be a date, year 25, and assumed to be the era of Chalcis. If this is correct it would have begun around AD 92 under Domitian; since the city was called Flavia Chalcis this interpretation seems the most satisfactory solution.<sup>[4]</sup> However, ΕΚ also appears on coins of Trajan from Antioch (CRS p. 357, 229). This time there is no convenient explanation to hand.

Under Hadrian at Antioch we have pairs of numbers: ΑΒ; ΓΔ; ΕΣ; followed by single numbers Ζ, Η, Θ and Ι (CRS, p. 358, nos. 230-236; see appendix 1). Paired numbers ΓΔ also occur in ligature at Seleucia Pieria (CRS, p. 420, no. 59).

This system of numbers seems to take over from an earlier system employing dots or pellets at four points of the compass (top | right | bottom | left), that had been employed on the Antiochene coins since the reign of Augustus. The transition occurs under Domitian: the dots or pellets are abandoned, and the numerals take over. Domitian then has a sequence of numbers running from 1-9 (CRS p. 354, nos. 170-178). Knowledge of this fact brings us no closer to understanding their meaning, however.

The relative abundance of coins with these markings meant that specimens were encountered by early numismatists, but the simple and repetitive designs did not arouse the interest of these savants. One of the more elaborate architectural types of Seleucia Pieria was featured in the 1568 edition of Sebastiano Erizzo's *Discorso*, and an 'ethnic in wreath' issue of Chalcis was also illustrated and briefly misattributed to Chalcis in Euboea.<sup>[5]</sup> In neither case does Erizzo have anything to say about the letters. Coins of Antioch, Beroea and Chalcis appear, without comment, in Adolphus Occo's catalogue of 1579.<sup>[6]</sup> The first numismatist to devote any serious attention to one of these 'ethnic in wreath' coins was Jean Tristan de Saint-Amant, who in 1635 published a coin of Trajan from Beroea. Based on the fact that Chalcis used similar types, Tristan argued that the two cities must have been close to one another and that the only instance of such a match was in Syria. Therefore this must be a coin of Syrian Beroea and not the Beroea in Macedonia. Though this was a brilliant deduction the numerical letter did not feature in either his description or discussion, although it surely ought to have been a factor in making the Chalcis and Beroea coins look so similar.<sup>[7]</sup>

[4] NORIS 1696, p. 316-322.

[5] ERIZZO 1568, pp. 326 (Chalcis), 328-329 (Seleucia).

[6] OCCO 1579, pp. 147 (Trajan, Beroea), 147-148 (Trajan, Chalcis), 183 (Pius, Antioch).

[7] TRISTAN 1635, p. 319, 'médaille XIX'.

Charles Patin published specimens of coins of most of these cities, and included the numerical letters in his descriptions, but not in his analyses, which were concerned with more fundamental questions of attribution and identification.<sup>[8]</sup> However it seems clear that Vaillant and other late seventeenth-century numismatists regarded the numbers as regnal years.<sup>[9]</sup> This was a natural enough assumption, seeing that many numbers on provincial coins are years according to civic eras. Yet a century later Joseph Eckhel had enough evidence to argue that these *notae arithmeticae* could not be regnal years because in some cases the numbers exceeded the number of years of a reign.<sup>[10]</sup> So, for example we have 9 for Lucius Verus at Hierapolis, and numbers 4 and above for Nerva at Antioch. He chose to describe them as *notae monetariorum* though without elaborating on their exact function in this regard.<sup>[11]</sup> In what became the standard catalogue of Syrian coins, the *British Museum Catalogue*, Warwick Wroth devotes very little space to these marks, other than to suggest they are 'marks of successive issues of the mint in each reign' and repeating the views of Eckhel.<sup>[12]</sup>

Other solutions to the mystery of these letters have been proposed. Pick, perhaps mindful of Eckhel's thoughts, proposed that they might be the marks of different *officinae* of the mint, though this did not earn general approval.<sup>[13]</sup> Macdonald, noting that the numbers appeared on civic coins of Antioch which carried dates in years according to its Julian era, thought that they might mark months.<sup>[14]</sup> At the time the highest known number in a sequence was 13, rather than the 12 that would normally be necessary to support the suggestion. This obstacle was overcome by proposing that the occasional use of 13 represented an intercalary month such as that found in the Babylonian and Jewish calendars. Unfortunately this ingenious solution does not work. The calendar of Roman Antioch is well known: it consisted of 12 months with Macedonian names, operating on a Julian 365-day year, without intercalary months; and numbers higher than 13 have since been found on Antiochene coins.

[8] PATIN 1696, pp. 143 (Seleucia), 145 (Hierapolis), 146 (Cyrrhus, Beroea, Chalcis), 161 (Chalcis), 177 (Zeugma), 180 (Cyrrhus), 182 (Seleucia, Hierapolis, Emesa), 183 (Emesa), 196 (Zeugma), 206 (Cyrrhus, Zeugma, Hierapolis). Often the numerical letters are absent from the illustrations as well as the discussions.

[9] VAILLANT 1700, pp. 27 (Beroea), 30 (Seleucia, Chalcis), 41 (Beroea), 42 (Emesa, Hierapolis), 51 (Doliche, Zeugma), 58 (Chalcis), 63 (Zeugma), 68 (Doliche); HARDOUIN 1684, p. 89-90 (Beroea).

[10] ECKHEL 1828, p. 259-260. Note that in *CRS*, p. 237, I erroneously accused Eckhel of treating the letters as regnal years, precisely the opposite of what he argued! It was Vaillant, not Eckhel, who regarded them as such.

[11] ECKHEL 1828, pp. 260, 302.

[12] WROTH 1899, pp. li, lv.

[13] PICK 1887, p. 302-303.

[14] MACDONALD 1903.

In the twentieth century Dieudonné proposed that they were numbers associated with individual obverse dies.<sup>[15]</sup> This is manifestly not the case, because there are usually several obverse dies associated with one number and a single obverse die may be associated with several numbers.

In *Coinage in Roman Syria* I reviewed the evidence and the various solutions proposed, without proposing a solution to this veteran conundrum.<sup>[16]</sup> More recently, R.G. McAlee, in an important contribution to the subject, has revived Pick's idea that they represent *officinae*.<sup>[17]</sup> In support he illustrates three Antiochene coins of Antoninus Pius, all with the same obverse die, and each with a different number: Δ, € , and S. On the die there is a fissure linking one of the loops in the wreath ties behind the emperor's head and a letter in the legend. The coins seem to show the die in two different states: one with a small fissure; and a later state of deterioration where the fissure appears larger (appendix 3). But the sequence is not that expected. The coin marked S (6) appears to show the fissure in an early state, and the one marked € (5) shows the more advanced state. The coin marked Δ (4) is less clear; it might be an intermediate state. McAlee takes this as evidence that the numbers cannot be sequences, but instead they denote numbered *officinae* with dies being shared between them.

If this is the case, it would be the earliest evidence for numbered *officinae* in the Roman empire by far. It would lend great support to long-running debates about the organisation of minting into *officinae*, including arrangements in the mint at Rome. Here would be evidence for an elaborate system of workshops extending back to the time of Domitian and, by assuming that the dots-at-points-of-the-compass represent an earlier version of the same system, back to the reign of Augustus.<sup>[18]</sup> Thus, if correct, the proposition has consequences for our understanding of the organisation of mints outside Syria as well.

As with any proposition concerned with interpreting these letters, the notion that they represent numbered *officinae* has its drawbacks as well as its attractions. How are we to explain the gaps in some of the sequences of numbers? What happened to *officinae* 5-7 at Beroea under Trajan, or 11-19 at Antioch under Nerva? In the latter case the gap is eliminated by suggesting that K stood for 11, but this seems quite implausible: if K is a number, it must stand for 20.<sup>[19]</sup> Other gaps are dealt with by suggesting the *officinae* in question were either idle or closed. This rather implies that the mints at Antioch and other

[15] DIEUDONNÉ 1907.

[16] CRS, p. 236-237.

[17] McALEE 2007, p. 8-12.

[18] Argued by McALEE 2007, p. 11.

[19] However, if the letters are treated not as numbers in this single case, but as an alphabet, then K should indeed follow I. Such a case would be unique, since other sequences of numerical letters higher than 10 are clearly numbers: IA, IB etc.

cities were permanent institutions and that *officinae* retained their numbers even when inactive. At Beroea, however, the city had never issued coins before, yet its *officinae* 5-7 were apparently idle (and they never operated in later reigns, either). The paired letters AB, ΓΔ, ЄS are ingeniously interpreted as amalgamated *officinae*. The mavericks BΔ, ΓA are seen in the same way: mergers of *officinae* 2 and 4, and 3 and 1; X is interpreted as the merger of 12 and 13 'which would otherwise require an unwieldy four letters' – presumably meaning that X is just a random mark, not a number.<sup>[20]</sup> However, if X is a number, it ought to be 600, unless it is a Latin 10 – which is not wholly implausible, given that third and fourth century mints sometimes used a mix of Greek and Latin numerals.

The notion of 'mergers' or some kind of joint operation signified by the double numbers is an attractive solution to some of the more puzzling marks. It would be helpful if it could be shown that dies were transferred from the single *officinae* to the merged ones. There are indeed die links between coins with the double numbers and those with single numbers, but unfortunately this pattern of sharing offers no support for the mergers (ΑΓ/ΓA with Є and I: appendix 4, nos. 3-4).

There are not many obverse dies associated with each number at many of the cities, and obverse die links between different numbers are quite common. It does not suggest that output per '*officina*' was particularly great. McAlee draws a comparison between these numbers and the numbered *officinae* of Antioch in late Antiquity, when production was on a much grander scale.<sup>[21]</sup> Would so many *officinae* have been necessary to strike these provincial issues? Under Trajan (AD 98-117) there were perhaps five workshops at the mint of Rome.<sup>[22]</sup> Under Gallienus, Claudius II and Quintillus, when debased radiate production was very high, there were only 12 *officinae* in operation in the Rome mint.<sup>[23]</sup> The fourth-century FEL TEMP REPARATIO coinage of AD 348-361 of Constantius II, which must be among the most plentiful issues of coinage produced in the Roman world, was struck in 15 *officinae* at Antioch (RIC VIII, pp. 521-524, 528). Constantinople had 11 *officinae* in the same period (RIC VIII, p. 453-461), and Rome had 6 or 7 (RIC VIII, p. 256-279). The mint at Alexandria managed with just 4 *officinae* (RIC VIII, p. 539-545). In contrast, the much rarer Antiochene issues of Antoninus Pius would have been produced in 10-12 *officinae*, and those of Marcus Aurelius and Lucius Verus in up to 15 *officinae*. The city of Hierapolis would have had 8 *officinae* under Antoninus Pius, and 11 under Antoninus Pius and Lucius Verus. These numbers seem

[20] McALEE 2007, p. 10.

[21] McALEE 2007, p. 11, where the numerical letters on provincial coins and the third-century *officina* marks on radiates are described as 'the same marking system'.

[22] WOYTEK 2010, p. 54-55.

[23] BESLY & BLAND 1983, pp. 25, 30.

inappropriate considering the apparently restricted output of these mints, but is that restricted output illusory?

The only way one can gain any idea of the size of the coinage is to conduct a die study. For the purposes of this paper I began an obverse die count for the issue of Hadrian with 8 different marks, which includes the 'merged' *officinae*. The study is incomplete, so this can be taken only as a preliminary result (for full details, see appendix 1). So far I have counted 18 or 19 different obverse dies distributed as follows:<sup>[24]</sup>

Mark	Observed dies	Estimate (GOOD) <sup>[25]</sup>	Estimate (CARTER) <sup>[26]</sup>
AB	2	2	2.11
ΓΔ	2	2	2.22
ЄS	6	10	12.1
Z	2	2.7	3.25
H	2	2	2.33
Θ	2 *	2	2.42
I	3	4.5	3.69

\* one of which appears to be a re-cut die from the ЄS group

Clearly we are not looking at a large operation, and the small number of obverse dies involved explains why the coins are not very common today. It would be easy enough to imagine all the dies listed above being employed by a single *officina*. Nor does there seem to be any very obvious pattern in the distribution of dies among the numerical letters, other than the fact that the number of obverse dies per mark was very few. Most probably had only 2 to 4 obverse dies. Two of the double numbered groups do not have larger numbers of dies than the single numeral ones, yet coins of these two, AB and ΓΔ, have a high survival rate. Coins of the third group, ЄS (assuming a sequence), have the largest number of dies, although the survival rate is quite poor. Whether this represents different production levels or merely accidents of survival is unknown. It could, I suppose, be argued that under Hadrian some of the *officinae* spent their time making other sorts of coins, such as silver tetradrachms, which could have skewed the pattern of bronze production, though the tetradrachms do not bear the numerical letters and the quantity of these silver coins produced under Hadrian does not appear to have been particularly large either.

[24] These studies are very much incomplete and I have not attempted to estimate the coverage or degrees of confidence (see ESTY 1986).

[25] The Good estimator (GOOD 1953) is generally regarded as less accurate than that of Carter (CARTER 1981). I include it here as a complement.

[26] On the application of both the Good and Carter estimators, see ESTY 1986.

Another die study, for Beroea under Trajan, presents a similar picture of limited output per ‘*officina*’ (for full details, see appendix 2), but also contains a number of die links between different numbers:

LARGE DENOMINATION			
Mark	Observed dies	Estimate (GOOD)	Estimate (CARTER)
A	6 *	7	7
B	3 (4?) <sup>[27]</sup> **	3 (4.18)	3.14 (4.35)
Γ	9 ***	9	10
Δ	3 ****	3.5	4.36
H	3	3	3.26

\* one of which is perhaps shared with B  
\*\* one of which is perhaps shared with A  
\*\*\* three of which are shared with Δ  
\*\*\*\* all of which are shared with Γ

MEDIUM DENOMINATION			
Mark	Observed dies	Estimate (GOOD)	Estimate (CARTER)
A	2	2	2.22
B	2 *	2	2.79
Γ	4 ** <sup>[28]</sup>	–	–
Δ	No coins known	–	–
H	1 ***	–	–

\* one of which is shared with Γ and H  
\*\* one of which is shared with B and H  
\*\*\* shared with B and Γ

As with the previous example, the number of dies per numerical letter is not very great (the sample for the medium denomination with Γ is clearly not sufficient to give a reliable estimate of the number of its dies). There are, however, more dies and fewer *officinae* than at Antioch. And as under Hadrian at Antioch, the third mark, in this case Γ (assuming a sequence), has the most dies, and large denomination coins with this numerical letter are commonest today. For the large denomination the die links between A and B (possibly) and between Γ and Δ (certainly) might suggest pairings, like the ‘merged’ *officinae* under Hadrian, but this cannot apply to the medium denomination, where a link between B, Γ and H occurs; therefore the comparison with the Hadrianic issue of ‘merged’ numbers might not be appropriate here.

[27] One coin, in the Ashmolean Museum, shares an obverse die with coins clearly marked A, but may be marked with the numerical letter B (see appendix 2). If it is eliminated from the corpus of dies for B, the number of observed dies drops from 4 to 3.

[28] All four dies are represented by a single coin.

If Δ is an independent *officina*, why does it share all of its known dies with Γ? The evidence here might favour a sequence: the dies commenced with Γ, and continued with Δ, with no new dies being engraved. The Δ coins are also rarer than coins with the other numbers, no doubt because they represent only part of the lives of the obverse dies utilised. The large denomination H appears to have no links with any others (though there is a link between H and other marks for the smaller denomination). If one assumes a sequence, it looks as if H comes after Δ, without the need to postulate as yet undiscovered coins marked €, S and Z to fill the gap.

Sequences are implied by other links between obverse dies (see appendix 4): where they can be readily understood as numbers (and thus leaving out marks like ΓA or AΓ) the links usually occur between adjacent numbers, rather than randomly between numbers. Thus at Beroea Γ and Δ share dies, not A and Δ or A and H. At Antioch adjacent numbers often share dies: A with B, B with Γ, Γ with Δ, Δ with €, and so on. This does not preclude the occasional links between non-adjacent numbers, though these tend to occur in issues employing a very small number of dies.<sup>[29]</sup> If *officinae* operated using a common pool of dies we might have expected more random links.

But what of the evidence of die deterioration? The example presented by McAlee is not the only example of deterioration observable in this coinage: he illustrates another from the same reign (Antoninus Pius), but in this case the sequence is what we would expect: the damage is absent on some specimens with Δ, and present on specimens with Γ and Δ, apparently becoming more pronounced on the coin with Δ.<sup>[30]</sup> But if we were to find a specimen bearing the number Δ without damage to the obverse die, would this mean that a sequence is out of the question? It surely depends on what we mean by sequence. If we mean that the issue of coins marked Δ began only after Γ had finished, then such a discovery would be incompatible with the hypothesis that the numbers represent a sequence. If, on the other hand, the numbers relate to some cycle or system that involved overlap it is possible to envisage some Γ and Δ coins being produced concurrently.

The other of McAlee's damaged obverse dies is the one that upsets the sequence theory, with a coin marked S that is in an earlier state than a coin marked €. A cursory hunt for specimens struck from this die reveals that it is quite common as a proportion of the whole of Antoninus Pius' Antiochene SC issues (appendix 3, die 1). The specimens reveal that coins with € and S exhibit

[29] The jump from Γ to H for the medium denomination at Beroea probably should not be included as an example, since there is no evidence for coins marked Δ, €, S or Z (though Δ is entirely possible and probably should be anticipated).

[30] McALEE 564(c)/1, 564(c)/2, 564(d)/1. Another damaged obverse die of Antoninus Pius is likewise known for two numerical letters, A and B (appendix 3, die 2). It too exhibits the die in both states, damaged and undamaged, for both numerical letters.



both states of the die, and perhaps also those with  $\Delta$  (unless it is an intermediate stage). While this could mean that  $\Delta$ ,  $\epsilon$  and  $S$  represent three different *officinae* that shared a die, it could also represent a sequence in which there was overlap, particularly with  $\epsilon$  and  $S$ .

If we were to accept the numbers as marks denoting different *officinae*, what kind of operation are we to envisage? Do the numbers represent different divisions of a mint, each with their own officials and teams of workers; or are we simply talking about 'work stations', that is, numbered teams each with their own anvil, with all teams working together in the same place and under the same supervision? In the cases considered above, the number of dies involved seems very small for either arrangement. There is no evidence here for the kind of scale or complexity that might be expected from a mint with many different *officinae* or work stations. A fuller die study of the issues examined here, including the reverses, might seem desirable, and would perhaps provide greater resolution; alternatively case studies of other issues marked with these letters might provide a better avenue of study for comprehending the phenomenon of the numerical letters.<sup>[31]</sup> One of the hazards of undertaking die studies in order to understand mint organisation is that one never knows how informative the exercise will be until it is substantially complete.

Taken together, the evidence of die links and the numerical letters suggest structure, if nothing else. In spite of the evidence of the die deterioration it is difficult to eliminate the sense that this structure involves numbered sequences, with dies occasionally being carried over from one numbered group to another, rather than the enumeration of *officinae* operating simultaneously. If the numbers instead represented batches of metal to be processed, with those batches sometimes being processed separately, and at other times together in the same single workshop, we would end up with the same kind of pattern as observed here. But that would still not explain the apparent gap between  $\Delta$  and  $H$  at Beroea, unless one supposes that the missing batches were processed into something other than coins. Given that we know next to nothing of the organisation of these Syrian mints such a supposition would be purest speculation, but not out of the question. Perhaps the solution to the numerical letters will be found by looking for parallels outside the coinage, on other mass-produced objects such as the products of quarries or mines; but there is always the possibility that their meaning will forever evade us.

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[31] A full die study of the coinage of Emesa of Antoninus Pius, marked with the letters  $A - Z$ , has been undertaken by J. Nurpetlian (NURPETLIAN, *forthcoming*). These coins do not differ from the general pattern presented here.

**APPENDIX 1 – OBERSE DIES OF ANTIOCHENE SC BRONZES OF HADRIAN**

(CRS, p. 358, nos. 230-236, McALEE 2007, p. 536)

One diagnostic feature of individual dies that is easily described is the position of letters in the obverse legend in relation to the tip of the laurel wreath the emperor wears. This feature is described for every die.

Obverses: Laureate, draped, cuirassed bust right. AYΤ KAIC Θ TP Π YI Θ NCP YIΩ TPA AΔPIANOC CEB(AC).

Sometimes with countermark, GIC 378, CRS, no. 237 (♯ in rectangular incuse).

**1 – WITH REVERSE SC, NUMERICAL LETTERS AB BENEATH. ALL WITHIN LAUREL WREATH OF EIGHT BUNCHES OF LEAVES, TERMINATING IN CIRCLE**

**AB·1 – Letters PY directly above point of laurel wreath**

BNF 446 – 11.9 g – ↑↑ | BNF 447 – 14.31 g – ↑↑ (countermarked) (fig. 1) | SNG Munich 225 – 15.04 g – ↑↑ | SNG Glasgow 2936 – 14.07 g – ↑↑ | SNG Glasgow 2937 – 16.07 g – ↑↑ (countermarked) | McALEE 536(a)1 – 16.68 g (countermarked) | CNG EA 246 lot 286 – 14.28 g – ↑↑ (ex McALEE) | CNG EA 247, lot 236 – 19.03 g – ↑↑ | CNG EA 247, lot 237 – 14.98 g – ↑↑ (countermarked) | Münzen & Medaillen DE 20, lot 548 – 13.84 g

**AB·2 – Letters YI directly above point of laurel wreath**

Ashmolean Museum – 13.38 g – ↑↑ | BM 1975 4-11-169 – 13.99 g – ↑↑ | ANS 1944·100·65739 – 14.99 g – ↑↑ (fig. 2) | CGB Monnaies 21 lot 2529 – 10.99 g – ↑↑ = Monnaies 13 lot 281

**2 – WITH NUMERICAL LETTERS ΓΔ BENEATH**

**ΓΔ·1 – Legend divided by point of laurel wreath NCP-YIΩ**

BMC 298 – No weight on ticket – ↑↑ (fig. 3) | BMC 299 – No weight on ticket – ↑↑ | BNF 448 – 16.07 g – ↑↑ | BNF 449 – 14.64 g – ↑↑ | BNF 450 – 14.36 g – ↑↑ | Ashmolean Museum – 14.95 g | McALEE 536(b) | Private collection, UK – 16.24 g – ↑↑

**ΓΔ·2 – Legend divided by point of laurel wreath NCP-YIΩ**

Ashmolean Museum – 14.12 g (countermarked) (fig. 4) | ANS 1953·171·1514 14.12 g – ↑↑ (countermarked)<sup>[32]</sup>

**3 – WITH NUMERICAL LETTERS CΣ BENEATH**

**CΣ·1 – Letters AΔ directly over point of laurel wreath**

BM 1978 3-7-1 – 15.45 g – ↑↑ (fig. 5)

**CΣ·2 – Letters PA directly over point of laurel wreath**

BNF 451 – 13.93 g – ↑↑ (fig. 6) | McALEE 536(c) – 12.4 g

**CΣ·3 – Letters TP directly over point of laurel wreath**

BNF 452 – 10.01 g – ↑↑ (countermarked) (fig. 7)

<sup>[32]</sup> This coin is noted in CRS, p. 358 as possibly having letters reading IΔ rather than ΓΔ, but a re-examination, and the fact that it shares its obverse die with a specimen clearly reading ΓΔ, leaves little room for doubt that the correct reading is indeed ΓΔ.

**€S·4 – Letters TP directly over point of laurel wreath**

SNG Copenhagen 209 – 16.53 g – ↑↑ (countermarked) | ANS 1971·193·26 – 15.79 g – ↑↑ (fig. 8)  
 (same rev. die as SNG Copenhagen 209) | ANS 1953·171·1510 – 13.91 g – ↑↑ (countermarked)

**€S·5 – Letter W directly over point of laurel wreath**

ANS 1953·171·1561 – 12.85 g – ↑↑ obv. cmk. (fig. 9)

**€S·6 – Letters TP directly over point of laurel wreath; bust bare, drapery on shoulder?**

SNG Copenhagen 226 – 16.79 g – ↑↑

**4 – WITH NUMERICAL LETTER Z BENEATH****Z·1 – Letter Y directly over point of laurel wreath**

Gitbud & Naumann – 13.5 g (countermarked) | BMC 295 – 14.47 g – ↑↑ (fig. 10) | SNG Copenhagen 208 – 14.07 g – ↑↑ (countermarked)

**Z·2 – Letter I directly over point of laurel wreath**

BNF 440 – 13.88 g – ↑↑ (fig. 11)

**5 – WITH NUMERICAL LETTER H BENEATH****H·1 – Letter W directly over point of laurel wreath**

Ashmolean Museum – 15.9 g (countermarked) | Ashmolean Museum – 12.12 g | McALEE 536(e) – 13.14 g | BMC 296 – 15.77 g – ↑↑ (fig. 12) | BNF 441 – 13.97 g – ↑↑ (countermarked) | SNG Newcastle 733

**H·2 – Letters TP directly over point of laurel wreath**

ANS 1974·226·197 – 16.21 g – ↑↑ (fig. 13) | ANS 1944·100·65737 – 12.51 g – ↑↑

**6 – WITH NUMERICAL LETTER Θ BENEATH****Θ·1 – Letters IW directly over point of laurel wreath**

BNF 443 – 14.69 g – ↑↑ (countermarked) (fig. 14) | ANS 1953·171·1515 – 12.77 g – ↑↑ (countermarked) | Forum 23158 – 13.69 g – ↑↑ (countermarked)

**Θ·2 – Letters TP directly over point of laurel wreath (appears to be €S·3 with some re-cutting of the hair)**

BNF, Chandon de Briailles 1632 – 13.08 g – ↑↑ (fig. 15) | BNF 442 – 11.33 g – ↑↑ | SNG Munich 222 – 10.65 g – ↑↑ | SNG Munich 223 – 16.77 g – ↑↑ | McALEE 536(f) – 12.78 g

**7 – WITH NUMERICAL LETTER I BENEATH****I·1 – Letters IW directly over point of laurel wreath**

BMC G 2149 | BNF 444 – 19.19 g – ↑↑ | BNF 445 – 14.02 g – ↑↑ (fig. 16) | ANS 1944·100·65740 – 14.82 g 1 – ↑↑ (countermarked)

**I·2 – Legend unclear**

McALEE 536(g)/1 – 10.6 g

**I·3 – Markedly different style; legend appears blundered, point of wreath dividing ΝΕΡΥΙΩΤΡΙΙΙ-ΠΑΝΟΚΚΕΡΑΒ (*sic*)**

ANS 1944·100·65738 – 8.67 g 1 – ↑↑ (fig. 17) = McALEE 536(g)/2

**APPENDIX 2 – OBVERSE DIES OF LARGE BEROEA BRONZES OF TRAJAN**

(CRS, p. 439–440, nos. 3a–10a)

Obverses: Laureate bare bust right. ΑΥΤΟΚΡ ΚΑΙC ΝΕΡ ΤΡΑΙΑΝΟC ΑΠΙCΤ' CΕΒ Γ'ΕΡΜ ΔΑΚ ΠΑΡΘΙ, variously abbreviated.

Reverses: ΒΕΡΟΙ/ΑΙΩΝ/letter, all within laurel wreath of eight bunches of leaves, terminating in circle.

**1 – WITH NUMERICAL LETTER A BENEATH****A·1 – ΚΑΙ and ΠΑΡΘ**

Private collection, UK – 13.32 g – ↑↑ (fig. 18)

**A·2 – ΑΥΤΟΚΡΚΡ (sic) and ΠΑΡΘ**

BMC 2 – 12.98 g – ↑↑ (fig. 19)

**A·3 – Die break between forelock and letter Γ of legend**

Ashmolean Museum – 10.87 g (fig. 20) | Institut für Numismatik und Geldgeschichte, Universität Wien, Numismatische Zentralkartei, 122

**A·4 – ΠΑΡΘ**

BNF 1591 – 11.81 g – ↑↑ | BNF, Chandon de Briailles 1753 – 12.81 g – ↑↑ | Cambridge, Leake 1330 – 13.30 g – ↑↑ = SNG Fitzwilliam 5848 | ANS 1944·100·65312 – 12.67 g – ↑↑ (fig. 21) | ANS 1948·19·1979 – 11.38 g 1– ↑↑ | ANS 1944·100·65313 – 13.99 g – ↑↑ | ANS 1991·3·4 – No weight on ticket – ↑↑ | SNG Glasgow 2697 – 15.44 g – ↑↑ | SNG Munich 444 – 13.79 g – ↑↑ (misread as letter Δ) | SNG Copenhagen 36 (?) – 14.05 g – ↑↑ | Den of Antiquity, August 2010 – 10.75 g | David Connors, 2011 – no weight

**A·5 – ΠΑΡΘ**

Cambridge, Leake 1329 – ↑↑ | SNG Munich 440 – 11.85 g – ↑↑ | SNG Leipzig 218 – 11.27 g – ↑↑ | CNG EA 226 lot 464 – 13.18 g – ↑↑ (fig. 22) (same reverse die as Cambridge, Leake 1329)

**A·6**

SNG Milan 5 – 12.14 g – ↑↑ (fig. 23) | SNG Leipzig 219 – 14.66 g – ↑↑

**2 – WITH NUMERICAL LETTER B BENEATH****A·3 – Die break between forelock and letter Γ of legend**

Ashmolean Museum 02 – 12.35 g (fig. 24) (letter B on reverse indistinct; could be A)

**B·1 – ΠΑΡΘ**

SNG Munich 441 – 12.37 g – ↑↑ | BMC 4 – 11.26 g – ↑↑ | BMC 5 – 13.96 g – ↑↑ (fig. 25) | SNG Milan 6 – 11.85 g – ↑↑

**B·2 – ΠΑΡΘ**

BMC 6 – 12.45 g – ↑↑ (fig. 26) | BNF 1595 – 12.36 g – ↑↑ | BNF, Chandon de Briailles 1756 – 9.41 g – ↑↑ | Ebay 29/V/2011 – no weight or die axis (same reverse die as BNF CB 1756) | Kölner Münzkabinett 43, 13/IV/1987, lot 269 | Beast Coins, 2010 – 12.6 g | Failla Numismatics 23/III/2011 – 11.5 g | Time Machine Co. 2011 – 9.7 g (pierced)

**B·3 – ΠΑΡΘ. Note irregular disposition of letters CΕΒ**

BM G 0910 – 11.99 g – ↑↑ (letter unclear, B or Γ) | BNF 1594 – 11.72 g – ↑↑ (fig. 27) | BNF RF 6721 1925·6 – 13.37 g – ↑↑ | BNF, Chandon de Briailles 1755 – 11.67 g – ↑↑ | ANS 1944·100·65314 – 12.37 g 1– ↑↑ | SNG Glasgow 2699 – 14.92 g – ↑↑ | Markov Auction 6,

9/XII/1998, lot 90 – 10.7 g | Peus 366, 25/X/2000, lot 1074 – 13.01 g | Münzen & Medaillen 20 10/X/2006 – 10.35 g ex Righetti | Wildwinds – no weight

### 3 – WITH NUMERICAL LETTER Γ BENEATH

#### Γ·1 – ΠΑΡ/Θ (Θ raised at end of legend)

Private collection, UK – 12.07 g – ↑↑ (fig. 28) | Winterthur 5086 – 11.40 g – ↑↑ | Ashmolean Museum – 12.93 g – ↑↑ | BNF 1604 – 8.78 g – ↑↑ | SNG Munich 442 – 13.08 g – ↑↑ | Aequitas. com 2010 | Münzzentrum Rheinland 138, 4/VII/2007, lot 115 – 10.9 g = Numismatica 13, 1976, 732 | Institut für Numismatik und Geldgeschichte, Universität Wien, Numismatische Zentralkartei, 122 | Zurquieh Co., 2011 – 13.98 g

#### Γ·2 – ΠΑΡ. Note two strokes of hair between O and C in ΤΡΑΙΑΝΟC

SNG Copenhagen 38 – 11.76 g – ↑↑ | BMC 7 – 14.35 g – ↑↑ (fig. 29) | BMC 9 – 12.16 g – ↑↑ | SNG Milan 3 – 12.3 g – ↑↑

#### Γ·3 – ΚΑΙ and ΠΑΡΘ. Very elongated head, high at rear of skull

BMC 8 – 13.84 g – ↑↑ (fig. 30) | Institut für Numismatik und Geldgeschichte, Universität Wien, Numismatische Zentralkartei

#### Γ·4 – ΠΑΡΘ

Ashmolean Museum – 10.49 g – ↑↑ (fig. 31) | ANS 1948·19·1980 – 11.44 g 1– ↑↑ | SNG Glasgow 2700 (?) – 10.23 g – ↑↑ | BNF CB 1758 – 11.94 g – ↑↑ | BNF, Voguë 209 – 11.64 g – ↑↑

#### Γ·5

SNG Leipzig 217 – 14.61 g 1– ↑↑ | Trade, 2011 (fig. 32)

#### Γ·6 – ΚΑΙ and ΠΑΡΘ

BNF 1597 – 12.82 g – ↑↑ (fig. 33) | BNF 1598 – 11.45 g – ↑↑ | SNG Milan 7 – 11.7 g – ↑↑ | Ancient Imports, 2011 – 12.11 g

#### Γ·7 – ΠΑΡ/Θ (Θ raised at end of legend)

Paris CB 1757 – 9.9 g – ↑↑ (fig. 34)

#### Γ·8 – ΠΑΡΘ

Münzen & Medaillen Basel 32 (1966), lot 458 (fig. 35)

#### Γ·9 – ΠΑΡΘ

BNF 1600 – 11.05 g – ↑↑ (fig. 36)

### 4 – WITH NUMERICAL LETTER Δ BENEATH

#### Δ·2

SNG Milan 1 – 13.43 g – ↑↑ | KBR 324 – 14.64 g – ↑↑ (fig. 37)

#### Δ·3

SNG Munich 443 – 12.74 g – ↑↑ | SNG Copenhagen 39 – 11.74 g – ↑↑ | Private collection, UK – 14.64 g – ↑↑ (fig. 38) | Ashmolean Museum – 14.16 g – ↑↑

#### Δ·4

Ashmolean Museum 14.12 g – ↑↑ (fig. 39)

### 5 – WITH NUMERICAL LETTER Η BENEATH

#### Η·1

SNG Munich 445 – 8.81 g – ↑↑ | SNG Milan 2 – 13.31 g – ↑↑ | SNG Milan 4 – 12.16 g – ↑↑ (fig. 40) | SNG Glasgow 2701 – 8.97 g – ↑↑ | Private collection, UK – 12.82 g – ↑↑ | Forum Ancient

Coins auction 25/IX/2010 – 12.7 g | Forum Ancient Coins, 2010 | Stoa Image Gallery, 2010 | Sayles & Lavender, 2010 – 9.66 g – ↑↑

### H·2 – ΠΑΡΘ

BNF 1601 – 10.50 g – ↑↑ (fig. 41) | SNG Bern 1856 – 14.39 g – ↑↑ | SNG Newcastle 652

### H·3 – ΠΑΡΘ

CNG EA 246 lot 222 – 13.7 g – ↑↑ (fig. 42) | Ashmolean Museum 08 – 10.42 g – ↑↑ | BMC 10 – 13.83 g – ↑↑ | Münzen & Medaillen DE 14-16/IV/2004 – 12.35 g | Forum Ancient Coins 21841 – 13.94 g (same dies as previous)

## OBVERSE DIES OF MEDIUM BRONZES

(CRS, p. 439-440, nos. 3b-10b)

Type as previous.

### 1 – WITH NUMERICAL LETTER A BENEATH

#### MA·1 – ΚΑΙ (?) ΠΑΡΘ (?) (Θ raised at end of legend)

Private collection, UK – 6.65 g – ↑↑ | SNG Glasgow 2698 – 6.91 g – ↑↑ | ANS 1944·100·65316 – 6.27 g – ↑↑ (fig. 43) | SNG Munich 446 – 6.63 g 1–↑↑ | SNG Munich 449 – 6.15 g – ↑↑

#### MA·2 – ΚΑΙ and ΠΑΡΘ/Θ (Θ raised at end of legend)

BMC 3 – 5.33 g – ↑↑ | BNF 1592 – 6.99 g – ↑↑ | BNF 1593 – 4.69 g – ↑↑ | BNF, Chandon de Briailles 1754 – 7.00 g – ↑↑ | ANS 65317 (fig. 44)

### 2 – WITH NUMERICAL LETTER B BENEATH

#### MB·1 – ΠΑΡΘ

SNG Newcastle 651 | KBR – 5.79 g – ↑↑ (fig. 45)

#### MB·2 – ΠΑΡΘ/Θ (Θ raised at end of legend)

Private collection, UK – 5.41 g – ↑↑ | BNF 1596 – 5.67 g 1–↑↑ (fig. 46) | BNF, Chandon de Briailles 1760 – 5.47 g – ↑↑

### 3 – WITH NUMERICAL LETTER Γ BENEATH

#### MB·2

BNF 1599 – 6.16 g – ↑↑ (fig. 47)

#### MΓ·1 – ΚΑΙ and ΠΑΡΘ/ΘΙ (ΘΙ raised at end of legend)

Leake 1332 – 8.54 g – ↑↑ (fig. 48) = SNG Fitzwilliam 5849

#### MΓ·2

SNG Munich 448 – 6.62 g – ↑↑

#### MΓ·3

SNG Munich 447 – 6.65 g – ↑↑

### 4 – WITH NUMERICAL LETTER H BENEATH

#### MB·2

BNF 1603 – 4.88 g – ↑↑ (fig. 49)

**APPENDIX 3 – OBERSE DIES OF LARGE DENOMINATION BRONZES  
OF ANTONINUS PIUS FROM ANTIOCH**

Die 1 (note fissure extending between the bottom loop of the wreath ties and the second N of ANTΩNEINOC in the legend).

**Δ**

BMC 309 – 12.77 g (figs. 50-51) (small fissure) | McALEE 557(d) – 12.1 g (intermediate/large fissure?) | Markov Auction 9 (14/XII/2000), 107 – 13.87 g (small fissure) | Münz-zentrum Rheinland 136 (18/IV/2007), 217 – 16.6 g (small fissure)

**€**

McALEE 557(e) – 14.44 g, (large fissure) | SNG Newcastle 740 (large fissure) | Private collection, UK – 13.20 g – ↑↑ (fig. 52) (intermediate fissure ?)

**S**

BNF 485 – 14.97 g – ↑↑ (fig. 53) (large fissure) | McALEE 557(f) – 12.9 g (small fissure) | CNG Electronic Auction 246, lot 299 – 12.67 g (small fissure) | Forum Ancient Coins, May 2011, no. 33832 – 17.01 g (fig. 54) (small fissure)

Die 2 (note the damage to the wreath ties and extending across the emperor's neck).

**A**

BNF 483 – 14.48 g – ↑↑ (fig. 55) (without damage) | CNG EA 71, lot 85 – 15.46 g (fig. 56) (with damage)

**B**

SNG Glasgow 2966 – 12.28 g – ↑↑ (without damage) | BNF 484 – 14.23 g – ↑↑ (fig. 57) (with damage) | Private collection, UK 13.83 g (with damage)

**APPENDIX 4 – SAMPLE LIST OF OBVERSE DIES SHARED  
BETWEEN DIFFERENT NUMERICAL LETTERS**

(this list does not include coins already listed in appendices 1-3)

***Antioch, Trajan***

1. McALEE 488(b) B = McALEE 488(c)  $\Gamma$  = Private collection, UK, no numerical letter
2. McALEE Trajan 487(h) H = McALEE 487(i)  $\Theta$
3. McALEE 492(c)  $\Gamma A$  = McALEE 492(f) I = SNG Munich 216  $A\Gamma$
4. McALEE 497(b)  $\epsilon$  = McALEE 497(f)  $\Gamma A$

***Antioch, Hadrian***

1. No numerical letter = A CRS, p. 360
2.  $\bar{A}$  = B CRS, p. 361

***Antioch, Antoninus Pius***

1. McALEE 564(c)  $\Gamma$  = McALEE 564(d)/1  $\Delta$
2. McALEE 565(c)  $\Gamma$  = McALEE 565(d)  $\epsilon$
2. McALEE 564(d)/2  $\Delta$  = McALEE 564(e)  $\epsilon$
3. McALEE 566(d)  $\Delta$  = McALEE 566(e)  $\epsilon$

***Antioch, Marcus Aurelius as Caesar***

1. McALEE 581(d) H = Private collection, UK,  $\Theta$
2. McALEE 581(a)/2  $\bar{A}$  or  $\Delta$  = Private collection, UK,  $\epsilon$  (see also CRS, p. 365)
3. McALEE 584(b)/2 B = McALEE 583  $A\Gamma$
4. McALEE 587(a)  $\bar{A}$  = McALEE 587(c)  $\Delta$

***Antioch, Lucius Verus***

1. McALEE 605(b) IA = McALEE 605(c) IB

***Hierapolis, Aurelius and Verus***

1.  $\Theta$  = I CRS, p. 450
2. I = IA CRS, p. 450

***Seleucia Pieria, Trajan***

1.  $\Gamma$  = S CRS, p. 420



FIGURES



*Fig. 1*



*Fig. 2*



*Fig. 3*



*Fig. 4*



*Fig. 5*



*Fig. 6*



*Fig. 7*



*Fig. 8*



*Fig. 9*



*Fig. 10*



Fig. 11



Fig. 12



Fig. 13



Fig. 14



Fig. 15



Fig. 16



Fig. 17



Fig. 18



Fig. 19



Fig. 20



Fig. 21



Fig. 22



Fig. 23



Fig. 24



Fig. 25



Fig. 26



Fig. 27



Fig. 28



Fig. 29



Fig. 30



Fig. 31



Fig. 32



Fig. 33



Fig. 34



Fig. 35



Fig. 36



Fig. 37



Fig. 38



Fig. 39



Fig. 40



Fig. 41



Fig. 42



Fig. 43



Fig. 44



Fig. 45



Fig. 46



*Fig. 47*



*Fig. 48*



*Fig. 49*



*Fig. 50*



*Fig. 51*



*Fig. 52*



*Fig. 53*



*Fig. 54*



*Fig. 55*



*Fig. 56*



*Fig. 57*

## BIBLIOGRAPHY

- BESLY & BLAND 1983 = E. BESLY & R. BLAND, *The Cunetio Treasure. Roman Coinage of the Third Century AD*, London.
- CARTER 1981 = G.F. CARTER, Comparison of methods for calculating the total number of dies from die-link statistics, *Journal of the European Study Group on physical, chemical and mathematical techniques applied to archaeology, statistics and numismatics*, PACT 5 – III.4, p. 204–213.
- CRS [2004] = K. BUTCHER, *Coinage in Roman Syria, Northern Syria, 64 BC–AD 253*, London.
- DIEUDONNÉ 1907 = A. DIEUDONNÉ, Les sigles littérales des monnaies d'Antioche et autres villes de Syrie à l'époque impériale, *JIAN* 10, p. 273–286.
- ECKHEL 1828 = J. ECKHEL, *Doctrina numorum veterum. Pars I, volumen III. Editio secunda*, Wien.
- ERIZZO 1568 = S. ERIZZO, *Discorso di M. Sebastianio Erizzo, sopra le medaglie de gli antichi*, Venezia.
- ESTY 1986 = W.W. ESTY, Estimation of the size of a coinage: a survey and comparison of methods, *NC* 146, p. 185–215.
- GOOD 1953 = I.J. GOOD, The population frequencies of species and the estimation of population parameters, *Biometrika* 40:3–4, p. 237–264.
- LYON 1965 = C.C.S. LYON, The estimation of the number of dies employed in a coinage, *Numismatic Circular* LXXIII, p. 180–181.
- HARDOUIN 1684 = J. HARDOUIN, *Nummi antiqui populorum et urbium illustrati*, Paris.
- MACDONALD 1903 = G. MACDONALD, The numerical letters on imperial coins of Syria, *NC*<sup>4</sup> III, p. 105–110.
- MCALEE 2007 = R.G. MCALEE, *The Coins of Roman Antioch*, Lancaster, PA.
- NORIS 1696 = E. NORIS, *Annus et epochae Syromacedonum in vetustis urbium Syriae nummis praesertim Mediceis expositae. Additis fastis consularibus anonymi omnium optimis. Accesserunt nuper dissertationes de paschali Latinorum cyclo annorum lxxxiv, ac Ravennate annorum xcv*, Leipzig.
- NURPETLIAN forthcoming = J. NURPETLIAN, *Coinage in Roman Syria. The Orontes Valley* (PhD thesis, University of Warwick).
- OCCO 1579 = A. OCCO, *Impp. Romanorum Numismata a Pompeio Magno ad Heraclium: Quibus insuper additae sunt inscriptiones quaedam veteres, arcus triumphales, & alia ad hanc rem necessaria. Summa diligentia & magno labore collecta ab Adolpho Occone R. P. Aug. Medico, antiquitatum studioso*. Antwerpen.
- PATIN 1696 = C. PATIN, *Imperatorum romanorum numismata ex aere mediae et minimae formae, descripta & enarrata*, Paris.
- PICK 1887 = B. PICK, Zur Titulatur der Flavii III. Die griechischen Münzen, *ZN* 14, p. 294–374.
- TRISTAN 1635 = J. TRISTAN, *Commentaires historiques, contenant en abrégé les vies, éloges et censures des empereurs, impératrices, caesars et tyrans de l'empire romain*, Paris.
- VAILLANT 1700 = J.-F. VAILLANT, *Numismata Imperatorum, Augustorum et Caesarum a populis, romanae ditionis, graece loquentibus, ex omni modulo percussa*, Third edition, Amsterdam.
- WOYTEK 2010 = B. WOYTEK, *Die Reichsprägung des Kaisers Traianus (98–117)* (MIR 14), Wien.
- WROTH 1899 = W. WROTH, *A Catalogue of the Greek Coins in the British Museum. Greek Coins of Galatia, Cappadocia, and Syria*, London.