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Toimittaja Tuukka Talvio

Englannin kielentarkistus Elina Screen

Ulkoasu ja taitto Elvi Turtiainen

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Jyrki Muona

THE ROME MINT COINS OF MARCUS SALVIUS OTHO

Introduction

Surprisingly little is known of the coins of the Rome mint during the brief reign of Emperor Otho. The first real insight into this coinage was offered by William Metcalf in 1993.¹ His main interest lay with the organization of the Rome mint. Metcalf explained his choice of Otho simply and to the point: “It is a relatively compact body of coinage that would seem to offer an ideal testing ground for the *officina* theory”. Although the study was a preliminary one, it clearly demonstrated two important results. First, David W. Mac Dowell’s scheme of the Rome mint did not fit Otho’s coinage and appeared to offer little predictive value. Metcalf was forced to state: “The key to the coinage of Otho remains to be found”. Second, in so far as hoard evidence reflected the actual coin output, minting was enormous during Otho’s reign, both in silver and gold. Katia Pontone gave an overview of Otho and his Rome mint coinage.² She was the first person to point out in print the systematic change in the depic-

tion of Otho’s coiffure on his coins. Finally, Kevin Butcher et al. analyzed the metal-lurgy and stylistic changes of the coinage in detail.³ They were able to demonstrate a significant debasement of the denarii in what was assumed to be the final issue of Otho’s coinage.

Three separate groups of coins seemed to have existed. One group was characterized by the long obverse legend IMP M OTHO CAESAR AVG TRP, another one by the short obverse legend IMP OTHO CAESAR AVG TRP and finally a third group had the short obverse legend, reverses with PONT MAX and denarii with debased silver content. This appeared to be the minting sequence as well.

Intriguing details remained open, however. Why did all the coins include TR P in the obverse legends, even though this title was granted more than a month after Otho seized power?⁴ A similar problem seemed to concern the title PM. Otho became Pontifex Maximus in early March, just over a month before his demise. The coins with

¹ Metcalf 1993.

² Pontone 2000.

³ Butcher & al. 2009.

⁴ Kienast 1996.

the reverse legend PONT MAX appear suspiciously rare to have been minted during the 40-day period in question. If neither of these known dates were reflected on the coinage, could they be relied on in other situations – a question Clay previously discussed with respect to Nero’s coinage?⁵ A die analysis seemed desirable in order to shed light on these questions. Several factors suggested that the material required for a die analysis could be obtained. All the Imperial coins of Otho were minted in Rome during a period of only about three months and the number of types was quite low.⁶ In addition, the coins are pictured regularly in sales catalogues because of their assumed rarity.

A large selection of Otho’s coinage can be seen at the FORUM ANCIENT COIN Gallery site:

<http://www.forumancientcoins.com/gallery/index.php?cat=12136>

In addition to all the known denarius types, the site includes a large selection of Provincial coins and special sections for contemporary and modern forgeries and fantasy pieces.

Material and methods

The project started in 1996 and the sample discussed here was collected between 1996 and 2001. This paper is based on an analysis of the images of the first 1000 coins that could be classified on the basis of their dies – 907 denarii and 93 aurei. The arbitrary cut-off point of one thousand coins was chosen to avoid an endless pursuit of completeness. Coins were entered in the

database without any expressly planned sequence; the only criteria for not including a particular coin were (1) suspected forgery and (2) inability to classify the dies with respect to known ones, usually because of damage or extensive wear. There was no need to treat the gold and silver separately as they were minted with the same dies. About 200 coins were studied during visits to museum collections and coin fairs, 150 were included from images provided by museums and 650 from sales catalogs and internet sales. A further 700 coins have been added later on, but they are not included in the calculations presented here. Observations made on the basis of the new coins are mentioned, however.

All coins or their images were digitally copied. Obverses and reverses were glued on separate cards and compared with the images of corresponding types already classified. Dies were given individual codes



Figure 1. Portrait types.
 Upper row, from left to right: A, A, B draped.
 Middle row, from left to right: B *, C, C *.
 Lower row, from left to right: D, D, Left.
 * Courtesy of Classical Numismatic Group, Inc.

⁵ Clay 1982: 11–16.

⁶ Sutherland 1984.

and the data were entered in a database. About 1,100 coins were studied to obtain a data set with the targeted 1000 coins. In order to break the material in more manageable groups, the dies of certain coin types were classified in subgroups. Obverse dies were classified into six groups on the basis of the portraits. For the analysis, five separate types were used (Fig. 1). Type A depicts the back of the hair with free-flowing locks, type B with small, more orderly and neat locks, type C with three or four horizontally placed waves and type D with waves on the top of the head united with the ones at the back of the head. Finally there is a portrait “Left” type with the same coiffure as in type D. The rare draped version of types A and B was not treated separately in the analysis and the two forms of type D were considered to be variants only. Reverse dies of the SECVRITAS and PAX types were subdivided on the basis of legend breaks in order to simplify the die comparisons: SECVRITAS, SECVRITAS, SECVR-I-TAS and PAX ORBIS, PAX ORB-IS and PAX ORBI-S.

The number of coins and dies in the material are given in Tables 1 and 2. The number and distribution of die-links is given in Fig. 2. Estimates of the “true” die numbers (D_{est}) as well as the coverage of the samples (C_{est}) and the confidence intervals (95%) were calculated according to Esty.⁷ The coverage with its confidence interval is an approximation of the probability that a known die will be found in a new sample. As an example, for an IMP

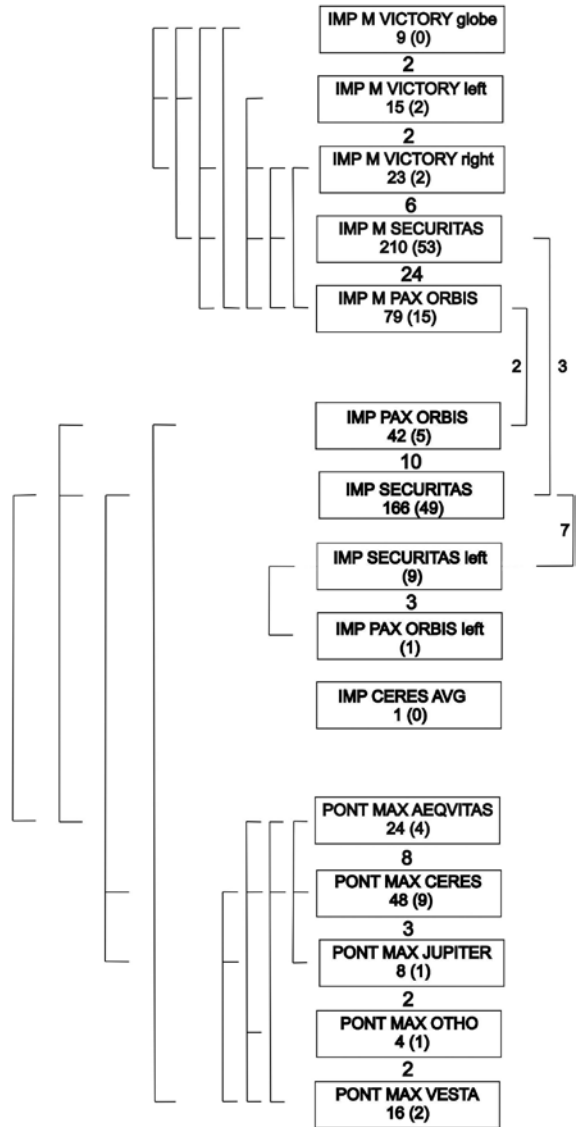


Figure 2. Die links.

The three sets of boxes represent the three groups of Otho's precious metal coins minted in Rome, fifteen types altogether. The numbers in the boxes refer to the number of dies in the sample (Number of reverse links within the type in the sample). Numbers between boxes refer to the number of reverse links between different types. Non-adjacent pair-wise links and links joining more than two reverse dies are shown separately left of the boxes. On the right side a sample of links joining obverses via reverses is given. The numbers refer to the number of such links observed in the sample.

⁷ Esty 1986; Esty 1997.

M type obverse die it is $58.4\% \pm 6\% = 52.4\% - 64.4\%$.

Esty discussed the complexities involved with die-links in detail.⁸ It is usually assumed that the obverse die was permanently fixed and the reverse dies were exchanged according to some predefined system. How the mint was organized during the first century is largely unknown, however. Was the obverse die always permanently fixed? Were reverse dies deposited in safekeeping every night and if so, did they serve the whole day and if not, could they have been returned to service twice or more often the same day? Obviously if unanswered, such questions render calculations very difficult. The die counts given here simply express the minimum number of die-changes that are required to explain the observed obverse and reverse die-links. In Fig. 2 the uppermost box represents my Type 1 coins, 1A + 1B, with the reverse VICTORIA standing on globe. Nine such reverse dies are included in the sample, each of which is only known combined with a single obverse. However, two cases are known where this type of reverse is combined with a reverse of the next coin type, 2A + 2B, reverse VICTORIA advancing left. This is shown with the number 2 between the boxes. The lines linking types to the left of the boxes refer to single obverse dies combining either (1) non-adjacent types – a technical problem of the presentation in table form or (2) more than two types. A line combining four dies adds three die-links to the total number of die-links but contains only that piece of information. Reverse dies link ob-

verse ones as well. Three such links are shown in Fig. 2 right of the boxes.

The structure of the three coin groups is not optimal for die-link studies. The reverses of group one and two are partly shared and the obverses of groups two and three are partly shared, but the obverses in the group two are partly different from those of the other groups. Thus the number of useful links is necessarily limited and not directly comparable between the groups.

Chronology, dies and die-links

Recent metallurgical studies of the first-century Rome mint coins establish one aspect of the chronology beyond doubt: the PONT MAX group of coins cannot be the first issue. The “Revised Neronian Standard” of silver issues, about 90%, was followed by Galba and groups one and two of Otho’s coins.⁹ The PONT MAX group coins were debased to 80%, a standard followed by Vitellius and Vespasian. Both the gold and bismuth traces in the bullion support this scenario.¹⁰ Further evidence exists in support of the first group being the first issue. Four of the nine reverse dies of Type 1 VICTORIA show signs of having been recut. In coins minted with these dies, the original letters “P” and “R” appear more or less clearly under the two “O”s of “OTHONIS” – this is especially clear with respect to the latter letter. Although coins minted with VICTORIA PR type Galba dies are not known as recut Otho dies, it seems clear that the reworked dies were originally intended for coins of Galba. Such dies can be connected only with the first days of Otho’s principate.

⁸ Esty 1990.

⁹ Butcher & al. 2009: 303.

¹⁰ Butcher & Ponting 2014.

Table 1. Otho, obverse dies.

The dies are divided into two groups according to the long and short obverse legends. Within both groups they are tabulated using the portrait classes A, B, C, D and Left. The draped dies are listed separately. Correspondence with Esty's formula: N = coins, d = dies, d1 = unique, d2 = 2. Dies observed in 3s or more are listed as well.

TYPE	COINS	DIES	UNIQUE	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MDR	16	4	0	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0
MA	341	159	92	31	17	8	1	0	5	1	1	1	2	0	0	0	0	1
MB	117	77	59	10	4	2	1	1	0	1	0	0	0	0	0	0	0	0
MC	59	40	27	8	4	1	0	0	0	0	0	0	0	0	0	0	0	0
MD	5	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IMP M OBVERSES TOTAL	538	283	179	54	25	11	2	1	5	2	1	2	2	0	0	0	0	1
A	5	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
B	84	52	37	5	3	4	1	1	0	0	0	0	0	0	0	0	0	0
C	24	12	6	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0
D	309	156	87	29	15	16	3	1	1	2	0	0	1	0	0	0	0	0
LEFT	40	16	6	4	2	2	0	2	0	0	0	0	0	0	0	0	0	0
IMP OBVERSES TOTAL	462	238	137	40	22	25	4	4	1	2	0	0	1	0	0	0	0	0
ALL OBVERSES TOTAL	1000	521	316	94	47	36	6	5	6	4	1	2	3	0	0	0	0	1

All reverse type dies of the first group are linked with each other and several obverse dies link three or four types with each other. The portrait types A and B dominate the dies of the first issue. They resemble, especially with respect to the coiffure, portraits of Nero. This may well have been an intentional attempt to obtain support from the section of the people who had preferred Nero to the strict Galba. Ancient sources tell us Otho had restored overturned statues of Nero and Poppea and allowed people to

call him Nero Otho.¹¹ To what extent the images on coins depict Otho – whether in real life or in sculptures – is not known. As Mogens Gjodesen pointed out, no secure portraits of Otho exist.¹²

The chronology and significance of the second and third group of coins is not as simple. They share the new short obverse legend omitting M but differ in bullion composition. Are these coins parts of two separate issues that followed each other or ones that were minted more or less

¹¹ Wellesley 2000: 60.

¹² Gjodesen 1959: 24–27.

Table 2. Otho, reverse dies.

The dies are divided into two groups according to the long and short obverse legends. Within both groups they are tabulated according to the reverse types. The five dies uniting the long and short obverse types are listed in parenthesis. They are counted either as unique or as doubles, depending on the type of calculation. Within an obverse group they are unique, for total counts doubles.

Correspondence with Esty's formula: $N = \text{coins}$, $d = \text{dies}$, $d1 = \text{unique}$, $d2 = 2$. Dies observed in 3s or more are listed as well.

REVERSE TYPE	COINS	DIES	UNIQUE	2	3	4	5	6	7	8	9	10	11
IMP M OBVERSE													
PAX	109	79	57 (+2)	15 (+2)	2	1	2	0	0	0	0	0	0
SECVRITAS	322	210	143 (+3)	36 (+3)	16	6	4	2	0	0	0	0	0
VICTORIA, globe	19	9	5	1	1	1	1	0	0	0	0	0	0
VICTORIA, left	29	15	7	6	0	1	0	1	0	0	0	0	0
VICTORIA, right	59	23	12	3	2	3	1	0	1	0	0	0	1
IMP M REVERSE TOTAL	538	331 (+5)	224 (+5)	61 (+5)	21	12	8	3	1	0	0	0	1
IMP OBVERSE													
PAX	52	42	33 (+2)	5 (+2)	1	1	0	0	0	0	0	0	0
SECVRITAS	244	166	116 (+3)	29 (+3)	10	6	1	0	0	1	0	0	0
CERES AVG	3	1	0	0	0	0	0	0	0	0	0	0	0
PONT MAX, Aeqvitas	35	24	17	4	2	1	0	0	0	0	0	0	0
PONT MAX, Ceres	72	49	37	8	1	1	0	2	0	0	0	0	0
PONT MAX, Jupiter	19	8	5	0	0	2	0	1	0	0	0	0	0
PONT MAX, Otho	12	5	2	1	1	0	1	0	0	0	0	0	0
PONT MAX, Vesta	25	16	11	4	0	0	0	1	0	0	0	0	0
IMP REVERSE TOTAL	462	303 (+5)	218 (+5)	51 (+5)	15	11	2	4	0	1	0	0	0
ALL REVERSES TOTAL	1000	639	442 (+5)	112 (+5)	36	23	10	7	1	1	0	0	1

simultaneously? The third group coins have no characteristics linking them to the first issue as both the obverse and reverse dies differ. The second group coins do, however, show connections in both directions. The PAX and SECVRITAS reverse coins can share reverse dies with coins of the first issue and such die combinations do exist. They are very few in number and this is significant. There are 53 internal die-links between the SECVRITAS reverses in the first group and 49 in the second group. For PAX reverses the corresponding numbers are 15 and 5. Only three SECVRITAS dies and two PAX dies have been found linking the long and the short obverse legend coins. Clearly the second group is sharply separated from the first one. This is further supported by the portraits. Portrait type A vanishes from the dies at this stage and D becomes the absolutely dominant one – the type “Left” being basically a mirror image of type D. Only three dies are known to have a type D portrait and the long obverse legend. These findings indicate that the switch involving shortening the legend and changing the portrait took place practically overnight. The difference between issue one and group two is easy to see in one glance at the coins. There is a slight difference in the obverse legends but a major change in the way the emperor is depicted. It is reasonable to believe that the portrait is the key element for producing this group of coins as the silver content of the coins did not change. Otho wanted to establish his own identity and possibly disassociate himself from Nero in people’s minds.

The PONT MAX reverse legend characterizes the group three coins. One re-

verse type, CERES, is a carry-over from the second group but the four others are new. The obverse dies do not differ from those used for minting the group two coins. Within the third group there are ten possible links between the types, nine of these are found in the sample. The missing one CERES – OTHO is present in the additional material. The PAX reverse of group two is linked with AEQVITAS and VESTA in the third group, and the SECVRITAS reverse with AEQVITAS, CERES and JUPITER. Altogether four obverse dies link the second and third group coins in the sample. A fifth linkage was found in the additional material and these coins were obtained for metallurgical study. The results showed that the coin with the SECVRITAS reverse was minted following the “Revised Neronian Standard” of 90% silver, whereas both the PONT MAX OTHO reverse coins were debased to 80%.¹³ Clearly the debasement was sharply executed and connected with a change of the reverse types. This further supports the conclusion that group three forms a separate issue characterized by a new look and a change in silver content.

As groups two and three can be linked only via their obverses and group two with issue one via its reverses the number of these links is not directly comparable. Looking at the links within types and between types reveals an interesting fact, however. The observed proportions are dominated by links within types. For issue one the numbers are $78/48 = 1.63$ and for group two $54/10 = 5.40$. In the third issue the situation is different, the numbers being $17/25 = 0.68$. Here the majority of the links are between types. This suggests that the third issue coins might have been minted

¹³ Butcher & al. 2009: 300–303.

employing a system that was different from the earlier one with respect to die-usage. In addition to the debasement and the change in reverse types, the third group denarii seem to be about 5–10% lighter than the previous ones.¹⁴ Adequate random data on the weights are not available, however, as hoards with recently minted coins do not exist.

The frequency distribution of the aureus types differs dramatically. Only five aurei of the third group were included in the sample. Two additional ones have been seen since, both of the CERES PONT MAX type. The first issue sample included 68 aurei and many have been added thereafter.

Clearly the third group is quite distinct, and there is good evidence supporting it as being a separate issue. The second group is problematic. It can be defined only by the features it lacks with respect to the other two groups.

Dating the issues

When the Senate granted Otho the imperial titles on the evening of 15 January 69 CE, he became the emperor of Rome, not the Roman Empire. The situation was precarious and there can be no doubt that he needed large amount of gold and silver to help secure his position. As shown earlier, the hoard evidence strongly supports massive minting of coins.¹⁵ As no coins of Otho without the TR P in the legend exist, it has been suggested he did not start minting coins immediately.¹⁶ However, the date for the official vote for his tribunician power, 28 February, is simply too late as a

starting point for minting. He needed the coins immediately and he needed them to show he was the emperor. One can hardly imagine Otho distributing coins of Galba to the praetorians who had murdered the previous emperor on his behalf. The re-engraved Galba reverses support such a scenario. There would be no need for such dies to exist had there been enough time to produce new ones. Clay has studied this question with respect to Nero and he pointed out that the same problem existed with respect to Otho.¹⁷ Whether constitutionally fitting or not, I can see no other solution than that offered by him: the emperors took the TR P title immediately, at least in practice. Accepting the starting day for Otho coinage as 16 January, the maximum number of days of production would be about 90. In reality it must have been less as minting most likely did not continue every day. If we assume a constant, even minting for 90 days, the consumption of dies was 11 obverses and 17 reverses per day, calculated using the point estimates for die numbers. The shortening of the obverse legend and change of the portrait type can be placed around 7 March on the basis of 562 obverse dies versus 440, i.e. 51 days after 16 January. Such a calculation is of course far from precise, especially as the second group's obverse die estimate has the poorest coverage of them all. The correct date is likely to be earlier. Even though these calculations cannot be seen as precise and may be off by a substantial margin, the calculations and die estimates appear good enough to show that

¹⁴ Butcher & al. 2009: 304.

¹⁵ Metcalf 1993.

¹⁶ Butcher & al. 200: 292–293.

¹⁷ Clay 2008.

the PONT MAX coinage cannot be seen as a separate third issue starting on 9 March, when Otho was conferred the title. Accepting the maximum number of obverse dies used for the PM coins as $263 + 70 = 333$ and the minimum number for all the others, $495 + 163 = 658$, we get the ratio $658/333$ which translates into 60 days, i.e. 16 March. It is clear that such an exercise is not warranted on the basis of the die estimates. A calculation closer to reality would give us 216 PM obverses and 825 other ones which would push the starting day to 23 March, 71 days from 16 January. A week earlier Otho had left Rome to meet Vitellius at Cremona for the decisive battle. Neither of these dates appears particularly attractive assuming (1) minting was constant, (2) it continued until news of Otho committing suicide reached Rome and (3) the PONT MAX coins formed a separate, final issue of the coinage.

The debasement of the PONT MAX denarii, the probable lowering of their weight and the scarcity of the aurei all suggest this group was special. Otho had no access to new bullion and his silver coins were basically minted from reused old coinage.¹⁸ If there was little to remint, debasement had to take place and minting of aurei to stop. The key to this issue might be simply an impending bankruptcy. Another possibility would be the minting of the PONT MAX issue for the needs of the army heading for the battle in North. A special issue promoting him as the victorious Emperor on horseback and joined by images of Jupiter, Vesta, Aeqvitas and Ceres could be seen as a moral boost.

The die-links show that all the coins without PONT MAX are linked typically

within the type, not between the types. The PONT MAX coins on the other hand are linked more often between the types than within them. One explanation for this change in mint practice could be that these coins were produced by a mint moving with the army. Greater variation in mixing the dies could easily take place in such a situation.

The coins

First group

Obverse legend: IMP M OTHO CAESAR AVG TRP

Reverse legends: VICTORIA OTHONIS, SECVRITAS PR, PAX ORBIS TERRARVM.

Head right, portrait bare or slightly draped.

Obverse D_{est} : 563 ± 69 , C_{est} : $66.7 \% \pm 6 \%$.

Reverse D_{est} : 767 ± 110 , C_{est} : $58.4 \% \pm 6 \%$

Portrait types: A = 58 %, B = 27 %, C = 14 %, D = 1 %.

TYPE 1. VICTORIA OTHONIS, Victory standing left on globe, holding wreath and palm.

Reverse D_{est} : 18 ± 9 , C_{est} : $73.7 \% \pm 25 \%$.

Portrait types: A = 89 %, B = 11 %.

1A. Aureus. This type is missing in all references, but it was to be expected. Two coins were included in the sample (the Fitzwilliam Museum, Cambridge and trade 1986, SKZ 4: 378).

1B. Denarius. RIC 17.

TYPE 2. VICTORIA OTHONIS, Victory advancing left, holding wreath and palm.

Reverse D_{est} : 27 ± 12 , C_{est} : $75.9 \% \pm 28 \%$.

Portrait types: A = 93 %, B = 3 %.

2A. Aureus. RIC 15. Four coins included.

2B. Denarius. RIC 16. One die has the obverse legend misspelled: "OTHONS". This is the only error observed in the legends of Otho's coins minted in Rome.

¹⁸ Butcher & Ponting 2014.

TYPE 3. VICTORIA OTHONIS, Victory advancing right, holding wreath and palm.

Reverse D_{est} : 38 ± 10 , C_{est} : $79.7\% \pm 13\%$.

Portrait types: A = 78 %, B = 22 %.

Type 3A. Aureus. RIC 13. Four coins included.

Type 3B. Denarius. RIC 14.

TYPE 4. SECVRITAS PR, Secvritas standing left, holding wreath and sceptre.

Reverse D_{est} : 509 ± 100 , C_{est} : $55.6\% \pm 7\%$.

Portrait types: A = 51 %, B = 25 %, C = 2 %, D = 2%

Type 4A. Aureus. RIC 7. By far the least rare Otho aureus, fourty-one coins included.

Type 4B. Denarius. RIC 8. The commonest Otho denarius.

TYPE 5. PAX ORBIS TERRARVM, Pax standing left, holding branch and caduceus.

Reverse D_{est} : 242 ± 88 , C_{est} : $47.7\% \pm 14\%$.

Portrait types: A = 64 %, B = 29 %, C = 6 %, D = 1 %.

Type 5A. Aureus. RIC 3. Seventeen coins included.

Type 5B. Denarius. RIC 4.

Second group

Obverse legend: IMP OTHO CAESAR AVG TRP

Reverse legends: SECVRITAS PR, PAX ORBIS TERRARVM, CERES AVG. Portraits right or left.

Right-facing obverse D_{est} : 191 ± 28 . C_{est} : $79.3\% \pm 7\%$.

Left-facing obverse D_{est} : 26 ± 8 . C_{est} : $77.5\% \pm 19\%$.

All obverses D_{est} : 216 ± 30 . C_{est} : $79.1\% \pm 10\%$.

Reverse D_{est} : 527 ± 115 . C_{est} : $51.7\% \pm 8\%$.

Portrait types: A = 0.4 %, B = 16 %, C = 3 %, D = 74 %, Left = 7 %.

Because the left and right facing obverse type dies might not have been freely interchangeable I have calculated the die-estimates for both separately as well as pooling them together. The results of the sepa-

rate calculations do not differ from that of the whole set.

TYPE 6. PAX ORBIS TERRARVM, Pax standing left, holding branch and caduceus. Portrait left.

Reverse dies included with those of type 7.

Portraits: Left = 100 %.

Type 6A. Aureus. Not known, but mostly likely existed.

Type 6B. Denarius. RIC 6. Rare.

TYPE 7. PAX ORBIS TERRARVM, Pax standing left, holding branch and caduceus. Portrait right.

Reverse D_{est} : 192 ± 110 , C_{est} : $32.7\% \pm 19\%$. Values include 6B.

Portrait types: A = 3 %, B = 31 %, C = 9 %, D = 57 %.

Type 7A. Aureus. RIC 5. Extremely rare, only one example included in the sample (Triton I: 1348, 1997, with known pedigree from the late 19th century). I have subsequently seen another example (Brussels Coin Cabinet).

Type 7B. Denarius. This type is not included in RIC or other major references. It used to be uncommon or even rare, but internet sales suggest more coins of this type have been found from the 1980s on.

TYPE 8. SECVRITAS PR, Secvritas standing left, holding wreath and scepter. Portrait left. Reverse dies included with those of type 9. Portrait type: Left = 100 %.

Type 8A. Aureus. RIC 11. Three included in the sample.

Type 8B. Denarius. RIC 12. Rare.

TYPE 9. SECVRITAS PR, Secvritas standing left, holding wreath and scepter. Portrait right. Reverse D_{est} : 439 ± 102 , C_{est} : $52.5\% \pm 9\%$. Values include 8A and 8B.

Portrait types: A = 0.4 %, B = 18 %, C = 3 %, D = 79 %

Type 9A. Aureus. RIC 9. Eighteen coins included in the sample.

Type 9B. Denarius. RIC 10.

Type 10. CERES AVG. Ceres standing left, holding corn ears and cornucopia. Portrait right.

Die estimates not calculated as only one is known.

Portrait type: D = 100%.

Type 10A. Not known.

Type 10B. Denarius. RIC 2. The rarest Otho denarius. The sample included three coins. I have studied four additional ones later. All seven coins were minted with the same die-pair.

Third group

Obverse legend: IMP OTHO CAESAR AVG.

Reverse legend: PONT MAX. Portrait right.

Obverse D_{est} : 263 ± 70 . C_{est} : $54 \% \pm 11 \%$. Reverse D_{est} : 250 ± 67 . C_{est} : $56 \% \pm 10 \%$.

Portrait types: C = 3 %, D = 97 %.

TYPE 11. Aeqvitas standing left, holding scales and scepter.

Reverse D_{est} : 76 ± 41 , C_{est} : $51.4 \% \pm 23 \%$.

Portraits: C = 8 %, D = 92%

Type 11A. Aureus. RIC 18. Two coins included.

Type 11B. Denarius. RIC 19.

TYPE 12. Ceres standing left, holding corn ears and cornucopia..

Reverse D_{est} : 157 ± 66 , C_{est} : $48.6 \% \pm 16 \%$.

Portraits: A = C = 8 %, D = 92%

Type 12A. Aureus. RIC 20. Three coins included. Two further ones seen since.

Type 12B. Denarius. RIC -. Although not accepted as genuine in RIC, this type is well established and in fact the most frequently seen PONT MAX type.

TYPE 13. Jupiter, seated right, holding thunderbolt and scepter.

Reverse D_{est} : 11 ± 4 , C_{est} : $73.6 \% \pm 18 \%$.

Portraits: C = 7 %, D = 93 %

Type 13A. Aureus. Not known.

Type 13B. Denarius. RIC 21.

TYPE 14. Otho on horseback right, holding spear.

Reverse D_{est} : 6 ± 4 , C_{est} : $91.7 \% \pm 18 \%$.

Portrait: D = 100 %

Type 14A. Aureus. Not known. A fairly unconvincing forgery of this type is in the Ashmolean Museum, Oxford. The obverse legend reads (D)MP M CAESAR AVG (TR P), a typical error found in many contemporary forgeries of Otho denarii. A very similar, although not die-identical, false denarius of this type is in the Brussels Coin Cabinet.

Type 14B. Denarius. RIC 22. A rare type. Only four dies were used to mint the twelve coins included. Subsequently I have seen seven additional coins with one new die. The additional material gives even stronger support for the peculiar nature of this issue: reverse D_{est} : 6 ± 2 , C_{est} : $94.7 \% \pm 9 \%$. The only simple explanation for such high coverage with few dies would be finding these coins in hoards with freshly minted coins. However, this does not seem to be the case. The old museum coins as well as the coins offered in trade since 1996 vary greatly in condition and cannot come from same sources. As far as is known, these coins have been found singly in hoards around Europe. Certain finding spots for single coins include well known hoards from Syria (Talkallah/Tel Kalak) and Scotland (Falkirk) as well as unpublished small hoards from Bulgaria (2), Romania and the former Yugoslavia.

TYPE 15. Vesta seated left, holding patera and scepter.

Reverse D_{est} : 48 ± 27 , C_{est} : $56 \% \pm 30 \%$.

Portraits: C = 6 %, D = 94%

Type 15A. Aureus. Not known. Forgeries of this type are in the Hunterian Coin Cabinet, Glasgow (with obverse legend IMP M OTHO CAESAR AVG TRP) and the British Museum.

Type 15B. Denarius. RIC 24.

All obverses D_{est} : 997 ± 88 . C_{est} : $68 \% \pm 7 \%$.
All reverses D_{est} : 1551 ± 171 . C_{est} : $56 \% \pm 4 \%$.

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Kirjoittajat

Frida Ehrnsten

FM, museoassistentti,
Suomen kansallismuseo
frida.ehrnsten@nba.fi

Antti Heinonen

Valtiotieteiden lisensiaatti,
johtava neuvonantaja
antti.heinonen@ecb.europa.eu

Tuomas Hyrsky

Taiteen lisensiaatti, kultaseppämestari
tuomas@hyrsky.fi

Eeva Jonsson

Numismatiikan opiskelija (pro gradu),
Helsingin yliopisto
eeva.jonsson@ark.su.se

Petteri Järvi

FM, intendentti, Turun museokeskus;
SNY:n puheenjohtaja
petteri.jarvi@turku.fi.

Outi Järvinen

FM, amanuessi, Suomen kansallismuseo
outi.jarvinen@nba.fi

Mauri Kiudsoo

MA, Tallinnan yliopiston historian
instituutin rahakokoelman hoitaja
mauri.kiudsoo@tlu.ee

Ivar Leimus

PhD, Viron Historiallisen Museon
rahakokoelman hoitaja
ivar@ajaloomuseum.ee

Aimo Linkosalmi

Varatuomari, SNY:n kunniapuheenjohtaja
aimo.linkosalmi@elisanet.fi

Antti Matikkala

PhD, antti.matikkala@helsinki.fi

Jyrki Muona

PhD, professori, yli-intendentti,
Luonnontieteellinen keskusmuseo
Senior curator, Finnish Museum of Natural
History, University of Helsinki
jyrki.muona@helsinki.fi

Jani Oravisjärvi

FM, arkeologi, Turun yliopisto
jani.oravisjarvi@utu.fi

Elina Screen

PhD, varhaiskeskiajan historian lehtori,
Oxfordin yliopisto, Trinity College
elina.screen@trinity.ox.ac.uk

Tuukka Talvio

FT, dosentti, Suomen kansallismuseo
tuukka.talvio@nba.fi

Siiri Tuomenoja

Fil. yo (arkeologia), Turun yliopisto
siiri.tuomenoja@gmail.com

Antti Vuori

FT, dosentti, tutkija
antti.vuo55@gmail.com