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Late Roman coin moulds in the collection of the Australian Centre for Ancient Numismatic Studies (ACANS), Macquarie University, NSW

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The following is a catalogue of fourteen circular or sub-circular clay moulds held in the ACANS collection, Inv. Nos 09.10-24 (from which I omit discussion of 09.17, No. 8, an Islamic piece, as beyond my field of competence).^{*} They were acquired commercially in Sydney in 2009; a label with the moulds says simply “Presented. M. Jungfleisch Cairo 1955”. Born in Paris, but based in Cairo, Marcel Jungfleisch published a succession of articles on Islamic and Egyptian numismatics and related subjects from the 1920s till his death in 1958. He was particularly interested in coin moulds and accumulated a large number of them, many of which were sold by Sotheby’s in 1972.

The manufacture of clay moulds to cast reproductions of Roman coins in antiquity has long been known. The discovery of a cache of such moulds in 1820 at Lingwell Gate, near Wakefield in Yorkshire led to a lively debate among members of the Royal Numismatic Society about their origin. Were they sanctioned by Roman authorities, or were they dastardly attempts to defraud? The fact that the composition of the moulds, and the accompanying crucibles and funnels used in the manufacture of the casts, matched the local clays and fossil inclusions put paid to the argument that they had been brought to Britain by Roman armies. Clearly they were made locally. It was concluded that they were “used for procuring a supply of counterfeit money, in defiance of established laws”. But by whom was not clear.¹

^{*} The author would like to thank Ken Sheedy and the Managing Editor for their help and advice, and Penny Walker for the photography and drawings. All dates are AD.

1 *Numismatic Journal* 2, 1837, p.58: communication from the Rev. Mr Reade, of Peckham. In fact this debate, ‘counterfeit or not’, has a much longer history, dating back to the discovery in Lyon in 1555 of a large number of clay moulds of coins of the Severan period. See J. Schwartz, ‘Supplément à la bibliographie des moules de monnaies impériales romaines’, *Gazette numismatique suisse* 13, 1963,13. There is now a huge bibliography on the subject, much of it captured by M.Jungfleisch and J.Schwartz, *Les moules de monnaies impériales romaines (Essai bibliographique)*, Cairo 1952; cf. G.Aubin, ‘Les moules monétaires en terre cuite du IIIe siècle: chronologie et géographie’, *RN* 159, 2003, 148 ff. I shall refer to more recent contributions below.

The moulds in the ACANS collection, however, have a very different geographical origin, as the Jungfleisch label accompanying them would seem to attest, leaving discussion about their status open. They conform in composition, size and date to moulds found in their thousands in excavations in Egypt.² It may very well be that the motive for their manufacture was the forging of official currency, as in the British case, but if so, the enterprise was huge, and one might have expected it to come to the attention of the authorities. Indeed, at intervals, it did!

Codex Theodosianus 9.21.3 [ed. T.Mommsen]

Idem a. ad tertullum proconsulem africae. si quis nummum falsa fusione formaverit, universas eius facultates fisco addici praecipimus, atque ipsum severitate legitima coherceri, ut in monetis tantum nostris cudendae pecuniae studium frequentetur. dat. prid. non. iul. mediolano constantino a. vii et constantio caes. cons.

The same [Augustus = Constantine I] to Tertullus, Proconsul of Africa: if anyone should fashion a coin by deceitful casting, we command that all his property be surrendered to the treasury, and that he himself should be punished with statutory severity, in order that such zeal for striking coins should be resorted to only in the mints. Issued on July 6th at Milan in the seventh consulship of Constantine A[ugustus] and the consulship of Constantius Caesar. [326]

Other laws in 9.21 refer to counterfeit [*adulterinus*] coins: e.g. in years 319 and 321 and again in 389 and 393. Clearly, counterfeiting was an ongoing problem for the Roman authorities. I shall return to the question of the status of the cast coins below.

Description

All our moulds are circular, or sub-circular. The clay is a mix of red and black in colour, but there is no uniformity: some are completely greyish black, others completely red. Many have the area of the impression of the coin grey-black (due to oxygen starvation) and the raised perimeter red. Most are about 5 mm thick at the edges, but two are twice as thick. They all have the impress of coins on both sides; in some cases one impression is sunk more deeply than the other. All have a neat, straight-sided or V-shaped cut in the edge, extending to the impression of the coin, for pouring the molten metal into the mould. The two sides of one piece of clay carry the impressions of separate entities. In other words each piece of clay shows the two unmatched halves of finished cast

2 E.Babelon, *Traité des monnaies grecques et romaines*, 1.1., Paris, 1901, 949 ff.; J.G.Milne, 'Roman Coin-Moulds from Egypt', *NC* 20, 1905, 342-353; M. Jungfleisch and J.Schwartz, *op. cit.* 5; B.Lichočka, 'Les moules égyptiens à monnaies tardives du British Museum', in *Archaeological Research in Roman Egypt*, ed. D.M. Bailey, *JRA Supp.* 19, 1996, 197-206; F. Barakat, 'Gussmünzen in römischen Ägypten', in *L'exception égyptienne? Production et échanges monétaires en Égypte hellénistique et romaine*, eds. F. Duyrat and O.Picard, Cairo, 2005, 213-223.



Figure 1

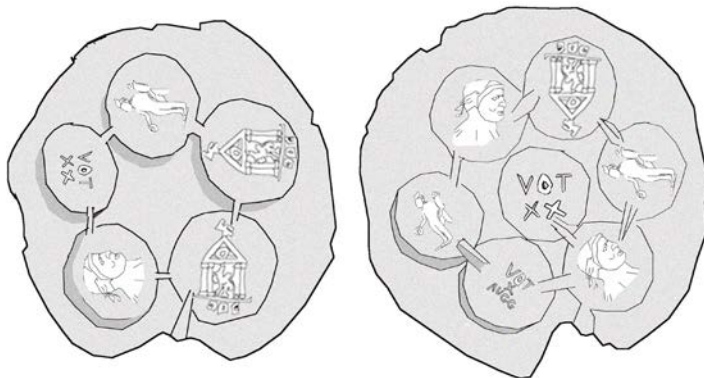


Figure 2

products, long since detached from their moulds. Thus there is no pattern: four of the moulds contain two obverses, four contain two reverses, and six have one of each.

Technique of manufacture

To cast coins individually would have been very time-consuming, so ways were devised to speed the process. In the method used to make the moulds discussed here, a coin (or coins) would be pressed into a disc of moist clay to form a clear impression, then the process would be repeated, the coins removed, and the clay discs bound together carefully to form a sausage-like cylinder. A furrow would then be cut into the side of the cylinder so that many casts could be made one from one pour [as illustrated in Figure 1]. The utmost care would be needed to bind the moulds together without distorting the impressions. This hypothesis neatly explains why each mould has impressions on both sides.³ Upon their cooling, the moulds would be broken apart and the cast coins extracted.

An alternative method, better attested by the actual finds, was to press several coins into a larger clay disc or plate, cutting a channel in the mould to reach all the coin impressions. An illustration of the technique is provided in Figure 2. Lichočka illustrates such discs with the impressions of five and even seven coins.⁴ Naturally most published moulds are of whole or substantially preserved specimens; excavation reports, however, attest to thousands of broken and unidentifiable ones.⁵ The hardness of the surviving moulds

3 In a pioneering article G.F.Hill, 'Ancient Methods of Coining' *NC Series 5*, no. 5, 1-42 (1922), described the process briefly, 2; M.R.Alföldi, 'Die Gussformen und gegossenen 'Fälschungen' kaiserzeitlicher Münzen,' *Chiron 1*, 1971, 351-363, discussed the technique in rather more detail; so, more recently, Barakat [n.2 *supra*], with detailed illustrations. Modern experimentation has shown the feasibility of the method: see P. Andrieux *et al.*, 'Études expérimentales et métallurgiques du moulage de monnaies en bronze de la fin de l'Empire romain,' in *L'exception égyptienne?* [n.2, *supra*, 225-252]. The accompanying illustrations show the assemblage of casts carefully bedded down into a kind of sauce-boat; cf. *Planche 2*, nos 2-4.

4 *Op. cit.* n. 2, Figures 1-8; cf. Hill, *op. cit.* 3

5 Cf. n.2, *supra*

(and the pattern of colour) is due to the heat of the molten metal in the casting process. The heat results in some shrinking of the clay, and in addition the metal shrinks upon cooling, so the resultant cast coins are somewhat smaller than the originals. They are also lighter in weight. Fewer cast coins survive than moulds. No doubt many were poor specimens failed to pass muster, and were melted down. I shall return to this point below.

Catalogue

I list, in order, the accession number, the outer measurements of the mould, the dimensions of the impression of the original coins, the weight of the mould, and its obverse/reverse clock-face axis.

Description of the copied coin follows, converting the mirror image back to its original form.

1. (Inv. No. 09.10) 31 mm; 23 mm; 5.35 g. Axis 5

a) Head of Maximinus Daia, laur. r.

GAL VAL MAXIMINUS NOB CAES

Legend used from 305 to 310 at Trier, Carthage, Siscia and the five Eastern mints: viz. Heraclea, Nicomedia, Cyzicus, Antioch and Alexandria.

b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae.

GENIO CA-ESARIS

In field, K A

P

In exergue, ALE

RIC VI p.678, 99a, 100a.

Alexandria 308-310

Note: here the Obv. and Rev. could have come from the same coin.



Catalogue 1a



Catalogue 1b

2. (Inv. No. 09.11) 29-30 mm; 20/19 mm; 9.5 g. Axis 9

a) Head of Maximinus Daia, laur. r.

IMP C GAL VAL MAXIMINUS PF AUG

Legend used from c. 308 to 313 in the five Eastern mints.

b) Head of Licinius, laur. r.

IMP C VAL LICIN LICINIUS PF AUG

Legend used from 311 to 313 at Rome, Heraclea, Nicomedia (from c. 309/310) and Cyzicus.



Catalogue 2a



Catalogue 2b

3. (Inv. No. 09.12) 31 mm; 24/25 mm; 5.1 g. Axis 6

a) Bust of Diocletian, laur. r., in imperial mantle w. r. hand raised.

DN DIOCLET[IANO] BAEATIS

RIC VI p. 676, 92a. Alexandria 308

b) Head of Maximinus Daia, laur. r.

GAL VAL MAXIMINUS NOB CAES

See 1a, above.



Catalogue 3a



Catalogue 3b

4. (Inv. No. 09.13) 30 mm; 25 mm; 6.3 g. Axis 4

- a) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae.

GENIO AUGG ET CAESARUM NN

In exergue, KB

RIC VI p. 580, 9a. Cyzicus c. 295-296

- b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae

GENIO POPULI ROMANI

In field, * ∨

* Δ

In exergue, ANT

RIC VI pp. 619-620. Antioch c. 298



Catalogue 4a



Catalogue 4b

5. (Inv. No. 09.14) 31 mm; 22 mm; 4.8 g. (chipped) Axis 6

- a) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae

GENIO IMPE-RATORIS

In field, K Γ

P

In exergue, ALE

RIC VI p. 678, cf. nos 101-108. Alexandria 308-310

- b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae

GENIO IMP-ERATORIS

In field, K A

P

In exergue, ALE

RIC VI p. 678, cf. nos 101-108. Alexandria 308-310



Catalogue 5a



Catalogue 5b

6. (Inv. No. 09.15) 34 mm; 22 mm; 10.9 g. Axis 10

- a) Bust of Gratian, helmeted with pearl diadem, draped, cuirassed, r., holding spear and shield.

DN GRATIA-NUS PF AUG
378-383

- b) Bust of Theodosius, helmeted with pearl diadem, draped, cuirassed, r., holding spear and shield.

DN THEODO-SIUS PF AUG
379-388



Catalogue 6a



Catalogue 6b

7. (Inv. No. 09.16) 35 mm; 28 mm; 3.7 g. (broken) Axis 2

a) Upper body of Genius, stg. l., modius on head, naked; chlamys over shoulder holding patera and cornucopiae

[GENIO] POPU-L-I ROMA[NI]

In upper field, r., B

b) Upper body of Genius, stg. l., modius on head, naked; chlamys over shoulder holding [patera and]

cornucopiae

[GENIO PO]PU-L-I ROMANI

In field, r., Γ

I

RIC VI p. 665, 32-33 Alexandria c. 301



Catalogue 7a



Catalogue 7b

8. (Inv. No. 09.17) Islamic, of different clay; impression on one side only; flat on image side (8a); convex on blank side (8b); not discussed.



Catalogue 8a



Catalogue 8b

9. (Inv. No. 09.18) 31 mm; 26 mm; 5.5 g. Axis 2

a) Head of Maximian, laur. r.

IMP MAXIMIANUS PF AUG

Note: Legend used at all major western mints east to Serdica, c.294- 305

b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae

[GE]NIO POPU-LI ROMANI

In l. field, *

In exergue, obscure letters and/or symbols.

Note: Legend used at all major mints, c.294- 305

Note: The Obv. and Rev. could have come from the same coin.



Catalogue 9a



Catalogue 9b

10. (Inv. No. 09.19) 31 mm; 23 mm; 6.0 g. Axis 2

a) Head of Galerius, laur. r.

IMP C GAL VAL MAXIMIANUS PF AUG

Note: Legend used from 305 to 311 in Serdica and the five Eastern mints (See 1a, above, for the latter.)

b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae.

GENIO CA-ESARIS

In field, X A

K

In exergue, ALE

RIC VI p.675,78. Alexandria 308

Note: This issue known only with Obv. of Maximinus Daia.



Catalogue 10a



Catalogue 10b

11. (Inv. No. 09.20) 29 mm; 20 mm; 4.1 g. (chipped) Axis 1

a) Head of Licinius, laur. r.

IM[P C] LIC LICINNIUS PF AUG

Note: This misspelled legend was only used in the Antioch and Alexandria mints from 308 to 315.

b) Jupiter stg l., chlamys over l. shoulder, leaning on sceptre; Victory on globe brandishing wreath in his r. hand; eagle with wreath at his feet to l.

IOVI CONSER-VATORI AUGG

In r. field, wreath over A

N

In exergue, ALE

RIC VII p. 704, 9 Alexandria 315

Note: This exact Rev. legend and mint mark is unknown with the LICINNIUS spelling in the Obv. legend, but cf. *RIC* VII p. 704, 7 for the Obv. and 8 for the Rev.



Catalogue 11a



Catalogue 11b

12. (Inv. No. 09.21) Fragmentary: 1.4 g. Axis 4

- a) Head laur., r.
]VAL MAX[
Galerius or Maximinus Daia, c.294- 313
- b) Genius, stg l.[modius on head], naked; chlamys over shoulder, holding patera [and cornucopiae]
GENIO IM[PERAT]ORIS
In field, K? A?
P
In exergue, ? [ALE?]
RIC VI p.678,101 ff. Alexandria 308-310
Note: If the mint-marks have been read correctly, this Rev. could match the Obv. 'a' (for Maximinus).



Catalogue 12a



Catalogue 12b

13. (Inv. No. 09.22) 31 mm.; 23 mm.; 3.6 g. (Broken: half piece) Axis 3

- a) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae
GENIO IMP-[ERATORIS]
In l. field, K
In r. field, remains of 2 letters, one above the other. The top one has a vertical stroke on its (original) l., with a serif; the bottom one is similar.
In exergue, ALE
Presumably from the KP series, *RIC VI p. 678, 101 ff. Alexandria 308-310*
- b) Genius, stg l. [modius on head], naked; chlamys over shoulder, holding patera and cornucopiae
GENIO IMP[ERA]TORIS
In field, K Γ
P
In exergue, ALE
RIC VI p.678, 101 ff. Alexandria 308-310



Catalogue 13a



Catalogue 13b

14. (Inv. No. 09.23) 32 mm.; 22 mm.; 5.0 g. (chipped) Axis 6

a) Head of Maximinus Daia, laur. r.

IMP C GAL VAL MAXIMINUS PF AUG

Note: Legend used from c. 308 to 313 in the five Eastern mints. See above, no.2a.

b) Genius, stg l., modius on head, naked; chlamys over shoulder, holding patera and cornucopiae

GENIO IMPE-RATORIS

In field, K S

P

In exergue, ALE

RIC VI p. 678, cf. nos 101-108 Alexandria 308-310



Catalogue 14a



Catalogue 14b

15. (Inv. No. 09.24) 32 mm.; 22 mm.; 5.7 g. Axis 1

a) Head of Maximinus Daia, laur. r.

GAL VAL MAXIMINUS NOB CAES

Note: Legend used from 305 to 310 at Trier, Carthage, Siscia and the five Eastern mints.

See **1a** and **3b** above.

b) Head of Galerius, laur. r.

IMP C GAL VAL MAXIMIANUS PF AUG

Note: Legend used from 305 to 311 in Serdica and the five Eastern mints (See above, **10a**.)



Catalogue 15a



Catalogue 15b

Commentary

Of the 14 obverses, the earliest is probably that of Maximian, c.294-305 [**9a**]. 11 obverses can be dated to the period 305-313. The emperors in question are Diocletian, in retirement, 1 [**3a**], Galerius, 2 [**10a**, **15b**], Maximinus Daia, 5 [**1a**, **2a**, **3b**, **14a**, **15a**] and Licinius, 2 [**2b**, **11a**]; the eleventh [**12a**] could be Galerius or Maximinus Daia. The remaining two, of Gratian and Theodosius [**6a**, **6b**], date to the 380s. The 14 reverses are all datable to the period from c. 294 to 315. Of these, 8 can be put between 308 and 310. Only one is later (315). All but one are variants of the standing Genius type.

Are our moulds from the same place, or even from the same batch of forgeries, if that is the appropriate term? The clay of each is very coarse, and similar in appearance, so they might well be. One mould, **6**, however, stands out: its clay is particularly coarse, and it has inclusions visible to the naked eye. This is the mould dating from the 380s.

Turning to the question of the motive for the casting of bronze coins, one might conclude that the intent was simply to defraud the government by the production of counterfeit coins. This would depend on bronze coinage being a fiduciary currency, with sufficient profit available to make the exercise worthwhile. Although we know too

little about monetary systems, particularly bronze, in late antiquity, to be sure of details,⁶ there seems little doubt that this was so.⁷

The conclusion assumes that the finished product was a convincing facsimile of the genuine article. This may not have been strictly true. As I have indicated above, the cast coins were both smaller in size and lighter in weight than the originals. Furthermore, cast coins tend not to be as sharp as struck ones, although authentic bronze coins in circulation would also suffer wear and weight-loss. Even so, if there were no alternative because there was a shortage of small change, the coins may have been locally acceptable despite their questionable nature.

Our sample is a tiny one, but it conforms to the overall character of the finds from Egypt. As mentioned above, there is an enormous quantity of moulds dating from the period of the Tetrarchs. They seem to be exclusively for casting the new bronze *folles*. For example, in 1943 c.2880 moulds were found in excavations in the region of Hermopolis Magna;⁸ and c.15,000 were found in the 1950 excavations of Qasr-Qarun/Dionysias.⁹ The phenomenon seems inextricably connected with Diocletian's currency reforms, c.294, which led to the issue of bronze coins of substantial weight.¹⁰ It is an easy assumption that there ensued a shortage of 'small change'. Given the huge scale of the casting operations, and the often shoddy nature of the product, it seems inconceivable that it escaped the notice of the authorities. Within a few years, under Constantine and his sons, the weight and size of the *folles* diminished substantially. After 326, legislation threatened those casting coins with dire punishment. Presumably the shortage was over. To what extent the State tolerated the operations before this remains unanswerable.¹¹

Another spate of casting occurred later in the C4 in Egypt (cf. our nos **6a** and **6b**, above).

6 The complexity of the subject is well illustrated by the discussion of the monetary system under Diocletian by C. H. V. Sutherland in *Roman Imperial Coinage (RIC)*, Vol VI (London, 1967), 93 ff.

7 A fundamental argument of a recently published article depends upon the assumption that base metal coinage was fiduciary throughout antiquity: D.T Ariel, 'Judean Perspectives of Ancient Mints and Minting Technology', *Israel Numismatic Research* 7 (2012), 43-80, p.44.

8 See Barakat, *op. cit.* 213.

9 Jungfleisch and Schwartz, *op. cit.* 5; Lichočka, *op.cit.* 195.

10 The new *folles* weighed 9-11 grams; cf. Sutherland, *RIC* VI, 662 ff. With Diocletian's currency reforms c. 294, minting policy, like many other matters, was highly centralised and tightly controlled. But the Empire was vast, and things did not always run smoothly. The mint at Alexandria was slow to react to official changes in the monetary system: on two occasions in the Tetrarchic period there was a delay in responding to reductions in the weight of the *folles* in the west, *viz.*, the reductions of early 307, and 310; see Sutherland, *op.cit.*, 100-102.

11 The key question, which Ariel, *op.cit.* 50, rightly seized upon, is 'identification of the legality of the premises (authorized or counterfeit) in which these molds were used'. Alas, this is 'difficult to address, as too few of the finds are archaeologically contextualized'. Nevertheless he concluded that their products were 'tolerated ... and circulated freely'; 51.

Lichocka provides some examples, and with them a caveat. Bronze coins can circulate for a long time. The date of the casting might long postdate the striking of the original coins. This can be proved by the dish or disc type of mould, described above, where 5 or 6, or even 7 or 8 coins were cast in the same plane.¹² One of Lichocka's discs has impresses of coins ranging in date from the 330s to the 380s (Constantius II *et al.* and Gratian Vota type; p. 294). Some of the originals were very worn. In this instance we must assume the casting was a private enterprise. If it were state sanctioned, one would expect only issues of current emperors to be used.

The theory that such casting of bronze coins reflects local shortage of small change gains strength when one looks further afield than Egypt. The production of bronze coins at Rome almost ceased following the debasement of the *denarius* and then the '*antoninianus*' in the currency inflation of the mid-third century. Italy, near the centre of operations, apparently fared well enough without recourse to unofficial casting. Asia Minor, with a host of civic mints producing bronze for local use, had no need to forge 'imperial' bronze. But out on the Danubian frontier there was an eruption of so-called *limes-falsa*. In response, a new mint was opened by Gordian III in 239 at the key Roman military colony of Viminacium, in modern Serbia, which produced a fine series of bronze *sestertii*, *dupondii* and *asses*. With it, the casting of '*falsa*' ceased.¹³ The government response on this occasion might seem to suggest that the preceding cast coinage was 'counterfeit', but we cannot extrapolate from this example to Egypt.

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12 *Op. cit.*, Figures 1-8.

13 W.Kubitschek, 'Antike Falschmünzen vom Donau-Limes', *Numismatische Zeitschrift*. 54, 1921, 153-; Cristian Gazdac, 'Center and periphery. The Roman monetary policy regarding the Lower Danube provinces at the mid-3rd century AD', in *Centru și periferie: lucrările colocviului național, Bistrița*, 23-25 aprilie, 2004, 71-72; cf. Alföldi, *op.cit.*, 362 .