Lead token moulds from Rome and Ostia[1]

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Introduction

The use of tokens in ancient Rome became spectacularly apparent to scholars in the eighteenth and nineteenth centuries, when thousands of lead monetiform objects were uncovered during urban renovation works in the city. The river Tiber and its banks proved a particularly fruitful location for these objects: hundreds of tokens were found here, as well as at least seven token mould halves.[2] Roman tokens, also known as *tesserae* in modern scholarship, exist in a variety of different shapes, but the majority of those from Rome are circular and roughly the same size as the smallest Roman coin denomination, a quadrans (ca. 14–18mm, fig. 1). Tokens also existed in other materials in the city (e.g. the bronze and brass pieces presented by Küter in this volume), but this contribution focuses on those produced in lead, which were cast from moulds.

There have been several works examining Roman tokens.[3] Far less attention, however, has been given to the moulds used to create these objects, which shed light on the potential manufacturers, users and contexts of tokens. The following discussion makes reference to 61 token moulds with known find spots, listed at the end of the chapter as table 1. This list is not exhaustive, but forms a starting point to begin a detailed study of these objects.

Material and manufacture

Figure 2 shows a representative half of a Roman token mould made of palombino marble.[4] Roman token moulds are rarely found intact (with both halves). Figure 3a–b illustrates one such rare example, a quadrangular mould with one half possessing a central casting channel with 'branches' leading to the individual token moulds (fig. 3a), while the other half has only

[1] The following abbreviations are used:
BMCRLT: *Roman Lead Tokens in the British Museum* (internal numbering system of the ancient lead tokens in the British Museum. A catalogue of these specimens is currently being prepared).
NSc.: *Notizie degli scavi di antichità* (1876–).
TURS: Rostowzew, M. (1903). *Tesserarum urbis Romae et suburbi*. St. Petersburg.

[2] Garrucci (1847), 1; Rostowzew and Prou (1900), 132; Rostovtsew and Vaglieri (1900); Dressel (1922).

[3] Ficoroni (1740), 77–85; Graillot (1896); Rostovtzeff (1897); Rostowzew (1905); Thornton (1980); Mitchiner (1984); Turcan (1988); Mlasowsky (1991); Overbeck (1995), 5–15; Virlouvet (1995), 309–24; Pensabene (2001–2003); Stannard (2015).

[4] Hirschland and Hammond (1968), 382.

a central casting channel and no 'branches' (fig. 3b).[5] Another mould with both halves (no. 51), found in Ostia, is octagonal in shape and both halves contain a central channel and 'branches'; the difference in design here demonstrates there was no fixed approach to the manufacture of these objects. Both moulds used nails to fasten the two halves together (those that survive are made of iron); on fig. 3 one can see a nail remaining in the lower left and upper right corners. Placing nails through pre-made holes would not only serve to bind the moulds together, but would also ensure that each half of the design was correctly aligned. Small grooves that can be found on the sides of the Harvard mould and some other specimens are suggestive of the use of wire (or a similarly strong material) to bind the two halves closely together (fig. 4).[6] Moulds used to cast coin flans have similar lines on their edges and it has been suggested these lines served to align both halves of the mould correctly.[7] The nails and grooves, then, may have served to both align the moulds and to ensure the two halves remained together under the pressure caused by the molten metal. The backs of token moulds are, for the most part, unworked rough stone.

The piece from Harvard Art Museums might also provide a clue as to how token designs were engraved. In the top left of the mould are two finely etched concentric circles (fig. 5). The inner circle is ca. 14mm in diameter, the size of the tokens this mould created. The outer circle may be an error or it may reveal that the size of the tokens was initially mapped out with two concentric circles before the engraver began to carve inwards (of the moulds personally inspected by the author to date, the Harvard mould is the only specimen to have this type of marking). The cutting of these circular impressions was achieved by a tool that left a deep central hole in the centre of each token cavity before the design was engraved – one can see a deep central hole on Fortuna's body in figures 2 and 5, and many Roman lead tokens carry central protuberances that are the result of this manufacturing method (e.g. fig. 6).[8] On the other hand these cavities may have been part of the mapping process, enabling the artisan to space out the individual token moulds on the marble and ensure they aligned

[5] Cesano (1904a), 148–49.
[6] Pardini, Piacentini, Felici, Santarelli and Santucci (2016), 653. The octagonal mould from Ostia (no. 51) has no such grooves, again indicating variation.
[7] Ariel (2012), 61.
[8] Rostowzew (1905), 6; see also J. H. Kroll's *Unpublished Catalogue of the Roman Lead Tokens in Harvard Art Museums*, LT57.

properly – this is suggested for the central cavities that are found on coin flan moulds excavated in Châteaubleau.[9]

Many of the moulds inspected by the author from Rome and Ostia are very similar to that presented in figs. 2–3 in terms of material, size, and design. There are, however, some variants. For example, a mould half now housed in the Altes Museum in Berlin and recorded by Rostovtzeff as TURS 3582 is made of what appears to be a very white limestone rather than palombino marble, and possesses worked, smooth edges and back.[10] Moulds 52 and 61 are made of Luna marble, a material that was prized in Rome for its colour, quality, and workability.[11] As with palombino, Luna marble allows fine detail.[12] While most moulds are rectangular in shape, octagonal (no. 51) and hexagonal (no. 48) shapes also exist.

The overall picture presented by the moulds is suggestive of a shared token making tradition around Rome and its environs: a common approach subject to some deviation. This, and the find spots of the moulds (discussed below), is suggestive of a distributed production rather than a centralised single workshop: tokens appear to have been created in multiple places by multiple individuals. The materials (easily workable stone, lead) were likely chosen because they were available and suited to the purpose. Palombino marble is perhaps best known for its use in Roman domestic decoration (in pavements and mosaics). The material properties of this marble means it is easy to work and carve with detail.[13] Lead was widely available and relatively cheap. Its low melting point (327.5 degrees Celsius) would have made it an ideal metal for this type of non-centralised production – the heat required to melt lead is much lower than copper (1085 degrees Celsius), for example, or silver (961.8 degrees Celsius).[14]

Studies of the use of moulds for the casting of coin flans have demonstrated that it is easier to remove cooled lead from stone moulds than from other materials. Stone also allows casting to be performed with the moulds upright (as suggested here by the placement of the channels), heat loss is minimised and oxidisation reduced. Stone moulds can also be reused.[15] The varying quality of the designs of Roman tokens is further evidence the moulds were not

[9] Pilon (2016), 56.
[10] A full publication of the moulds in the Altes Museum Berlin, along with the lead tokens in the Münzkabinett Berlin, is in progress.
[11] Strabo *Geography* 5.2.5; Malacrino (2010), 25.
[12] http://www.artofmaking.ac.uk/explore/materials/6/Luna-Marble (accessed 07/06/2019).
[13] Pardini, Piacentini, Felici, Santarelli and Santucci (2016), 661.
[14] Boulakia (1972).
[15] Ariel (2012), 49. It is thought that flan production for the Roman mint was outsourced to private contractors, see Woytek (2019).

produced in a central workshop. The mould half now in the British Museum (no. 26), for example, has an array of different images of relatively good quality, whereas no. 61 has only a simple cross shape.

Although fig. 2 would have created tokens of identical imagery and shape, other examples demonstrate that a single mould might be used to produce tokens of different shapes and design. Number 9, for example, is a mould that was used to make circular tokens showing a ram as well as triangular tokens bearing the letters PR. Similarly moulds 4, 5, 13, 16, 20, 26, 28, 40, and 42 all created tokens with differing imagery and/or shapes. Number 28 was used to cast tokens that were in the form of a *tabula ansata* (a form of Roman tablet with dovetail handles that carried inscriptions, often used for votive offerings or in commercial contexts).[16] Since this token design also bears an inscription (MSA), one might interpret this as a playful representation that engages with the dialogues of monumentality and literacy in the Roman world.[17] Number 4 created tokens carrying the same letters (although these were at times joined together or ligate), but of differing sizes (17 and 9mm). Given the relatively large difference between the larger and smaller tokens made from this mould I would suggest that the different sizes were intentional, and that the diameter here must have been significant in some way, perhaps to distinguish between different values or different classes of bearer.

The intended design needed to be engraved as a mirror image and this was not successful in all cases. Errors are particularly noticeable on tokens carrying letters that are back to front (retrograde); here the engraver has simply engraved the letters as they would be written rather than allowing for the casting process.[18] The pairing of different designs, shapes and letters all within the one mould means that the current scholarly scheme of presenting Roman tokens is somewhat misleading; following on from Rostovtzeff tokens are largely presented according to 'themes' in modern scholarship (tokens referring to the emperor, for example, are grouped together, as are tokens showing ships, those carrying animals, etc). The moulds themselves indicate that often multiple 'themes' might be placed on tokens as part of a single production. But without a full corpus of moulds (and the known specimens are far fewer than the surviving variety of tokens) it is impossible to reconstruct what tokens might have been made together in every instance.

[16] A shape also known from TURS 1205, with Fortuna on one side and the legend DOM on the other.
[17] Eckardt (2017), 225.
[18] E.g. TURS 200, 659, 1352, 2904, 3081, 3357. Sometimes only a single letter is retrograde within a larger legend, e.g. TURS 1137 (pl. X, no. 74).

Find spots in Rome and Ostia

Many Roman token moulds are now housed in museums or reported in older publications and have no associated find spot.[19] Table 1 focuses on those moulds with find spots: it is not exhaustive, but nonetheless provides enough data to draw conclusions about the production and use of tokens in antiquity. The first observation is that moulds like this (and thus this particular method of manufacturing lead tokens) appear *only* to be found in Italy (and predominantly in Rome and Ostia) in antiquity. Although tokens of various sorts were used across the Roman world, the method of manufacture must have differed by region.

To my knowledge only two moulds have attributed find spots outside Rome and Ostia. The first is a mould half found in Como in northern Italy. During the construction of a palazzo at Via Plinio n. 4 in the late nineteenth century a mould was found inside an ancient edifice along the ancient city walls.[20] The mould, made of soapstone, measured 222 x 92 x 41mm, large in comparison to those from Rome and Ostia. Likewise, the circular designs for the tokens measure ca. 90mm in diameter, larger than those found in the capital. This mould created monetiform objects that carried Roman numerals (IV, V, V, VII, VIII, VIIII, IX, X, X, XI, XII, XII, XIII, XIII); above each numeral was a dot to indicate to the viewer how to interpret the piece (i.e. to tell the user to read IX instead of XI). These 'dots' possess similarities to the cavities discussed above and might have additionally served a similar function. Nogara suggested the mould might have created pieces of copper or lead; the author knew of no specimens that might have been produced from the object and nor do I. The second piece was recorded by Mommsen in the ninth volume of the *Corpus Inscriptionum Latinarum* (CIL) in the nineteenth century with a find spot of Telesia, which is located south of Rome.[21] Rostovtzeff also mentioned this piece, although it is clear he possessed some doubts about its authenticity.[22] One imagines that as these objects come to the attention of modern scholarship once more, further examples from elsewhere in Italy might come to light.

The finds with stratigraphy provide us with a date range during which these moulds were used. The most recent find of moulds (nos. 10–12) has a disposal date of the first century AD,

[19] E.g. Ficoroni (1740), 166, nos. 1–3; TURS 3572–99. Moulds have also begun to appear on the market; see Bertolami Fine Arts, Auction 44, 20 Apr 2018, lot no. 339.
[20] Nogara (1917).
[21] CIL IX, 6087.
[22] TURS 3599 (pl. XII, no. 7); Rostowzew (1905), 82 n. 6.

whereas no. 52 suggests such moulds were still in use in the third century AD. Number 37 was found in the Casa dei Dipinti in Ostia, a Hadrianic apartment block still in use in the third century, while the finds associated with no. 44 also indicate a date in the second or third centuries AD. The surviving bricks from the theatre of Ostia are of the late second century AD (nos. 45–46).[23] These details correspond to the dates given to Roman lead tokens by scholars on the basis of style and design. Although lead tokens exist in Italy from the Republican period, in Rome they appear to be more of an imperial phenomenon, with designs referring to emperors from Augustus (27 BC–AD 14) to the emperor Carinus (AD 283–85).[24] Oddly, amongst the thousands of specimens gathered by Rostovtzeff, there is a lacuna in imperial representation between the Antonine dynasty (which ends AD 192) and Carinus.[25] This picture might change or be further clarified by future research.

Although most of the moulds listed here do not possess detailed stratigraphic information, the data that does exist enables further observation. The first is that *these moulds have been found*. Finds of coin dies from the Roman Empire are rare and largely occur outside Italy; it is presumed that dies were destroyed after use to prevent forgery.[26] By contrast, token moulds have been found in a relatively high number and certainly in much higher quantities than coin dies in Rome and Ostia.[27] This suggests that there was less concern that the moulds might be used for financial gain if they fell into the wrong hands. Rather, one gets the impression that these moulds were thrown away once they had served their purpose. And this purpose was likely one that was connected to a specific moment in time: either a single event or time period, after which the token would no longer have value. Indeed, although some of the moulds presented here exist only in fragments (nos. 5–6, 15, 33, 42, 53, 59–60), many are whole, although admittedly without their matching halves. Was each half of the mould intentionally deposited in a different area to prevent later fraud? Or, if one half of a mould broke, was the other simply thrown away? The nature of the archaeological record is such that it frequently possesses rubbish or abandoned items, although more work is needed before final conclusions are drawn.[28]

[23] http://www.ostia-antica.org/dict.htm provides an overview of Ostia and its buildings (accessed 07/06/2019).
[24] Pedroni (1997).
[25] TURS 72–74.
[26] For a list of known coin dies from antiquity see Malkmus (2007).
[27] From the catalogue of Malkmus (2007) only one Roman period die (p. 134, no. V-27a) was found in Ostia, and none in Rome.
[28] No. 5 possesses some fractures in the marble, but it is impossible to know whether the stress of repeated casting or the manufacturing of the mould itself caused these.

The temporary nature of lead tokens in Rome and Ostia may help to explain the bewildering array of images found on surviving specimens. If, as is suggested by some designs, a particular set of tokens were connected to a particular festival (e.g. the Saturnalia, a carnival type celebration during which social norms and hierarchies were inverted), one would imagine that the design of the tokens would change from year to year or celebration to celebration.[29] This would ensure that only the tokens created for a particular event could be used in a specific context; last year's tokens, so to speak, would no longer be valid. Once created, some moulds might have been reused over a longer period of time (as is known for more modern tokens), particularly in contexts like baths (nos. 39, 52).[30] Again it is possible that there was significant variation within a common framework. The data suggests very localised production of limited volume (the moulds are scattered rather than grouped together in a workshop, and would only have produced a handful of tokens at each casting), again suggestive of particular moments in time for particular communities or contexts.

For ancient Athens it has been suggested that a token might be countermarked once or more to enable to it to be reused; the rarity of this practice on tokens from Rome and Ostia suggests that in this region it was more common to prepare new tokens (and imagery) for each occasion.[31] This approach is similar to that found in Palmyra in Syria; here tokens are believed to have functioned as entrance tickets to sacred banquets. The archaeological record suggests that a particular token was created for a particular event: in the temple of the god Arsu, for example, a pot was found containing 125 tokens, all of the same type. These tokens were about to be distributed, or had already been gathered and then deposited in the vessel during the relevant event. As Raja concludes, these small objects were mini monuments attached to a specific event, serving both a practical and communicative function (they were tickets, but also bore imagery and text).[32] If we similarly view the tokens of Rome and Ostia as temporary monuments, then the use of lead becomes even more understandable. These were objects not intended to last (as with coinage); a soft, easily worked metal could be used. Unlike the example from Palmyra, however, the moulds from Rome and Ostia suggest that different imagery was used for the same context. Whether this was to differentiate between

[29] TURS 501–10 for lead tokens referring to the Saturnalia. On the festival itself see Harrison (2001) and Dolansky (2011).
[30] For a parallel see Carradice (1994), who explores how only a change in benefactor led to a change in design for Scottish communion tokens.
[31] Crosby (1964), 116.
[32] Al-As'ad, Briquel-Chatonnet and Yon (2005); Raja (2015).

different types of users or goods, or simply because inhabitants of this region preferred a wider array of imagery, is a subject for further research.

A cultic context is possible for the three moulds found during excavations on the NE corner of the Palatine on a site identified as the *Curiae Veteres* (nos. 10–12). Roman authors detail that the *Curiae Veteres* (a sanctuary) was established by Rome's founder Romulus as he divided the people of Rome and its religious observances into 30 *curiae* or parts. The *curiae* corresponded to different regions of the city, providing inhabitants with a spatial or neighbourhood identity that was possibly also expressed on tokens.[33] When Rome's population grew a new building was constructed (*Curiae Novae*), but religious obstacles meant that some of the *curiae* remained in the old building.[34] It is likely that each individual *curia* in the city had a local structure associated with cultic feasting activity, but during particular festivals all the *curiae* assembled together in the central *Curiae* building in an act of city-unity. During the Fornicalia ('festival of the ovens'), for example, the priests of each *curia* assembled to determine the order in which each *curia* would perform their rites (this appears to have changed every year), a process that was likely performed by lot.[35] Moulds nos. 22 and 53 were also found at cultic sites: the 'Syrian sanctuary' on the Janiculum Hill in Rome and the Sabazeum in Ostia, both places associated with the worship of foreign cults.

The finds from the Baths of the Swimmer (Terme del Nuotatore) in Ostia provide an interesting case study for further exploration. In the same room (Ambiente XVI) as mould no. 52, which has a beetle design, but in an earlier layer (Stratum II, dated to the end of the second century and beginning of the third century AD) some lead waste was found. This scoria was damaged, but clearly had the shape of a central canal with branches emerging off each side; the logical conclusion is that this is waste from a token mould.[36] This would suggest that tokens were cast on site, though it is likely that it would also be possible to transport moulds to a local workshop for production.[37] One imagines that normally the tokens would be cut away from the 'branches' and then the remaining scrap metal would be melted down to make further tokens or other objects.[38] Ambiente XVI at this period has been

[33] TURS 490–93, interpreted by Rostovtzeff as referring to different regions in Rome. The author has not yet been able to verify all the descriptions given by Rostovtzeff. TURS 491 seems to have an alternative reading.
[34] Richardson (1992), 105; Steinby (1993), 337.
[35] Ovid, *Fasti* 2.527–32; Richardson (1992), 106.
[36] Carandini and Panella (1977), 271. Further lead scoria from token moulds ('coduli') have been found in Ostia (Ostia Antiquarium inv. nos. 15732 a–f), although they have no find information. See Spagnoli (2001).
[37] This practice is known for Scottish communion tokens. See Wood (1904), 108.
[38] This is the suggestion for the medieval period. See Kool (2013), 303.

identified as a wine bar or *popina*.[39] Excavations from taberna two in the theatre at Ostia revealed a set of poorly cast tokens still intact from the mould; here the casting may have been deemed too poor and this particular attempt thrown away, but it is further evidence that production was local and decentralised.[40] This taberna also yielded a token mould that was undecorated (no. 45), again suggesting that the engraving of these moulds was decentralised.[41] The existence of moulds in small shops suggests that some of these pieces may have been used in commerce or exchange in small economic circuits.

Also found in the Baths of the Swimmer were several lead tokens: in area 25 (Ambiente XXV), in stratum VA (dated to ca. AD 80–90, associated with the installation of the hydraulics), a token was found with a female figure on one side (probably Juno with patera and sceptre) and Fortuna on the other. From stratum III of this area (dated to ca. AD 190/200–225) two tokens were found of differing designs. The first carries the letters F C on one side with an unusual representation on the other; Rostovtzeff suggested that this was a *furca* (a pole used to carry the equipment of Roman legionaries), but the image also has similarities to the stylised representation of the caduceus found on tokens of late antiquity (fig. 7 is a different specimen with this same design).[42] The second token is decorated with a palm branch on one side and the letters PM (?) on the other.[43] The excavations thus reveal tokens with a variety of designs used across the lifetime of the baths (ca. AD 89–250). A further token was excavated more recently in the area NE of the bath complex showing Isis (or a priestess of Isis) on one side and a nude male figure on the other.[44]

How precisely tokens were used in bathing complexes is still unknown, although they have been found in these contexts in Rome, Ostia and the provinces.[45] It has been suggested they might have functioned as entrance tickets, or that they acted as a form of money in an extremely local context, exchanged in return for particular goods or services once inside the complex.[46] The baths were another clear context where Roman tokens were used, which we

[39] Medri, di Cola, Carandini and Panella (2013), 20.
[40] *NSc.* (1912), 393.
[41] Mould no. 44 may also come from this same taberna, but the description is unclear and it may in fact come from another location in the theatre.
[42] Alföldi (1937), 20.
[43] TURS 691–92; Carandini and Panella (1977), 391.
[44] Pardini (2014), 43, from a stratum dated to AD 160–180/90.
[45] See most recently Spagnoli (2017) on an assemblage of tokens from the Terme dei Cisiarii in Ostia.
[46] Rostowzew and Prou (1900), 136–37; Rostowzew (1905), 102–03; Turcan (1987), 59; Turcan (1988), 626–30; Collingwood and Wright (1990), 2408.3; Lagóstena Barrios (1993), 308; Pedroni (1997), 209–10. Mora

should add to the shops and cultic/festival contexts already discussed. The multiple use contexts of these objects no doubt also contributed to the variety of designs.[47]

Community cohesion and belonging

The tokens and token mould found in the Baths of the Swimmer do not bear images that a modern scholar might immediately associate with Roman bathing.[48] This cautions us of the dangers in using imagery alone to deduce the use contexts of Roman tokens. But the imagery meant that tokens had both a practical and communicative function. Indeed, the designs on tokens would have served to both create and reinforce group cohesion, a feeling of belonging. Many of the moulds presented here carry letters on them, (in one instance in Greek rather than Latin, no. 42). These letters form combinations that we are hard pressed to decipher.[49] One presumes that these are abbreviations of words or phrases. Abbreviation occurs on Roman inscriptions and on Roman coinage, but in these contexts it was relatively standardised. The bewildering array of letter combinations on tokens, however, goes well beyond this repertoire. To elaborate: in contrast to many other media in the Roman world, the tokens in Rome and Ostia do not take efforts to explain their message to the user. Roman coinage, for example, often carries a legend that explains to the viewer the scene shown (e.g. the name of a deity or a reference to a particular ceremony). These clarifications are, for the most part, absent on tokens, which instead bear images without explanation, or, as mentioned above, letters that seem enigmatic. But this may have served to contribute to the feeling of belonging to a particular community. Tokens, after all, were created for a specific, very local group; one imagines that in this context little explanation of the design was necessary since the meaning would have been self-evident for the targeted user. The ability of users to understand the 'code' on the token, in contrast to those outside the group, likely contributed to a feeling of community, similar to the way that specific codes and complex images were used on the *jetons royaux* in France explored by Valin in this volume.

The banqueting tokens of Palmyra also worked in this way: these were everyday objects that, for a moment in time, controlled access to space – this too would have resulted in a dialectic

Serrano (2002), 52–53, wondered whether the specimens he presents from Alameda are connected with a nearby cultic site.

[47] Also suggested for Athenian tokens, Crosby (1964), 78.

[48] By contrast, other token designs name baths or carry representations of the strigils and oil flask used during the process (e.g. TURS 886–904).

[49] Woytek (2015), 485 rightly draws attention to the fact they are epigraphic puzzles.

of those on the 'in' (i.e. invited, with a ticket) and those on the 'out', a feeling of community further enhanced by the imagery and writing on the token.[50] From this perspective, tokens in Palmyra operated in an architectural sense, allowing cultic followers into a space and excluding strangers at a particular moment in time, an action akin to that of a door or fence.[51] If the tokens from Rome and Ostia associated with bathing complexes did serve to control access to these spaces (although the find locations provide no definitive clues in this regard), then both the design and use of the object contributed to feelings of belonging to a particular group. Here, however, the group may not have possessed a cultic focus, but was perhaps one based on a particular client or patronage networks.[52]

Conclusions

Token moulds very similar to those presented here are also known in Europe from the medieval period onwards (fig. 8).[53] The moulds from this later period are largely made of limestone, an easily workable material, with some created from slate.[54] Many of these later examples also possess casting channels and holes in the corners to ensure both halves are correctly aligned and remain bound together during the token creation process. The find spots of these moulds also indicate a very local production, by religious groups (e.g. communion tokens, which might be made by a single church) or other small communities.[55]

It is clear that more Roman moulds exist than was previously thought. Many questions remain unanswered, most notably *who* specifically carved these designs (a member of the community? a local artisan?), how this method of manufacture spread throughout Rome and Ostia, and why this production technique does not appear to have moved beyond central and (perhaps) northern Italy. The production and use of lead tokens in this region appears to be very local: associated with individual bathhouses, shops, or festivals, for instance. But in tracing the history of this very local phenomenon, we can begin to better understand Roman society, and how the broader mediascape of impressive buildings, materials and images issued by the emperor and the elite might be utilised in the everyday.

[50] Raja (2015), 179.
[51] Irvine, Hanks and Weddle (2013), 92, 102 explore this concept for sacred architecture.
[52] Pedroni (1997), 209 suggests that perhaps, in the case of Fregellae, a patron may have given bath access tokens to his clients as an act of euergetism. Turcan (1988), 630 suggests something similar for Roman lead tokens.
[53] Pozzi and Labrot (2008) (from Sondrio in Italy).
[54] Kool (2013), 303, n. 43.
[55] Kool (2013), 302.

Table 1: Roman lead token moulds with known find spots.

Unless otherwise stated, all entries are for a single mould half made of palombino marble. Full information for many specimens was not provided by the publications.

No.	Description	Place	Context	Ref.
1	99x88mm mould for 7 square tokens of ca. 12–14mm, all of the same design: **bird (dove?) standing right**.	Rome	Found on the Esquiline Hill in 1882 during construction works.	Cesano (1904a), 208.
2	110x62mm mould for 8 circular tokens of ca. 17mm, all of the same design: **ANTONI** (with some letters ligate).	Rome	As above.	Cesano (1904a), 209.
3	63x126mm mould for 15 triangular tokens of ca. 7mm, all of the same design: **C**	Rome	As above.	Cesano (1904a), 210.
4	120x70mm mould carrying two sets of casting channels. One is for 5 circular tokens of 17mm with **LVE,** and the second for 7 circular tokens of 9mm with a **monogram of LVE**.	Rome	As above.	Cesano (1904a), 211.
5	78x91mm fragment of a mould carrying two sets of casting channels. One is for 5 triangular tokens of ca. 10mm with **VC**, and the remnants of the second show triangular tokens (two visible) of ca. 13mm with **ST**.	Rome	As above.	Cesano (1904a), 212.
6	41x32mm fragment of a mould for a token of ca. 20mm showing a **nude male standing holding uncertain objects (bow and arrow?) in either hand**.	Rome	As above.	Cesano (1904a), 213.
7	120x70mm mould for 9 square tokens, all of the same design: **Fortuna with rudder in one hand and cornucopia in the other**.	Rome	19th century excavations of the ‘Monte delle Giustizia’ near the	*NSc.* (1877), 347–73.

			Servian wall to make space for Termini train station.	
8	No further details given.	Rome	'Monte delle Giustizia' near the Servian wall.	*NSc.* (1877), 357.
9	80x85mm mould for 3 circular tokens showing a **ram standing left** and four triangular tokens with the letters **PR**.	Rome	'Monte delle Giustizia'.	Ruggiero (1878), no. 4.
10	67x63x28mm mould for 9 circular tokens of ca. 7mm, all of the same design: **V F**.	Rome	Found in Area II of the NE Palatine excavations (*Curiae Veteres*), near the wall in a layer associated with the spoliation of the pre-imperial *curia* after the Neronian fire.	Pardini, Piacentini, Felici, Santarelli and Santucci (2016).
11	123x75x29mm mould for 9 square tokens of ca. 5mm all of the same design: **C**. Residue from the casting process was in the canal.	Rome	As above.	As above.
12	84x79x23mm mould for 9 circular tokens of ca. 6.5mm, all of the same design: **R F**.	Rome	Found in Area II of the NE Palatine excavations, in a medieval context associated with the spoliation of Neronian-Flavian material.	As above.
13	100x80mm mould for 15 tokens: 2 of **uncertain design**, 5 square tokens showing a **cantharus**, 8 circular tokens showing a **phallus**.	Rome	Aventine Hill.	Ruggiero (1878), no. 7.
14	105x75mm mould for 7 circular tokens of ca. 17mm, all of the same	Rome	The Tiber. Found in the 19th century during	Cesano (1904b),

	design: **The Three Graces standing nude**.		the Lungotevere works.	no. 1.
15	95x50mm fragment of a mould for 3 square tokens of ca. 12mm, all of the same design**: Fortuna standing right with rudder right hand and cornucopia in left**.	Rome	As above.	Cesano (1904b), no. 2
16	92x88mm mould for 4 circular tokens of ca. 30mm: 2 with a **dog standing right and CAP above**, 2 showing a **quadruped standing right** (goat or doe?).	Rome	As above.	Cesano (1904b), no. 3.
17	105x60mm mould for 9 circular tokens of ca. 8mm all of the same design: **a galley with oars and two people in it**.	Rome	As above.	Cesano (1904b), no. 4.
18	120x90mm mould for 5 square tokens, all of the same design: **S and palm branch**.	Rome	As above.	Cesano (1904b), no. 5.
19	80x90mm mould for 5 triangular tokens of ca. 14mm, all of the same design: **P above AF**.	Rome	As above.	Cesano (1904b), no. 6.
20	120x75mm mould for 5 tokens of ca. 16mm: 3 square tokens with the letter **L**, 2 triangular tokens with the letter **A**.	Rome	As above.	Cesano (1904b), no. 7.
21	Mould decorated with a **standing figure**, no further information.	Rome	Excavations associated with the construction of the Viale di Circonvallazione Gianicolense, near Trastevere train station.	Gatti (1926), 243.
22	Mould for 6 tokens, all of the same design**: two nude wrestlers with**	Rome	'Syrian Sanctuary' on the Janiculum Hill.	*NSc.* (1909),

	raised fists, an amphora between them and leaves blossoming around them.			410.
23	142x98mm mould for 13 circular tokens of ca. 11mm, all of the same design: **horse standing right**.	Rome	No precise provenance, but Cesano was certain it was found during works in Rome.	Cesano (1904b), no. 8.
24	103x84mm mould for 8 circular tokens of ca. 13mm, all of the same design: **Hercules standing right holding cup in outstretched right hand and club in left**.	Rome	As above.	Cesano (1904a), no. 1.
25	125x90 mm mould for 7 triangular tokens of ca. 13mm, all of the same design: **PR above S**.	Rome	As above.	Cesano (1904a), no. 2.
26	Mould for 6 circular tokens: 2 of ca. 21mm showing **Fortuna, standing right, holding rudder in right hand and cornucopia in left**; 2 circular tokens of 20mm showing **Minerva, standing right, holding sceptre in left hand and resting right on shield**, and 2 circular tokens of ca. 20mm showing **Victory standing right, holding wreath in outstretched right hand and palm branch in left**. The mould appears to have originally been intended for 7 tokens, but the lower right of the mould was never incised.	Rome	British Museum accession record notes 'from Rome' (presented by the Rev. G. J. Chester), but no further information is provided.	British Museum 1890, 0514.1
27	112x70mm mould (material unreported) for 5 circular tokens of ca. 17mm, all of the same design, to produce tokens showing: **Minerva standing right holding spear in right**	Rome	Museo Nazionale di Napoli, part of the Borgia collection. Since Cardinal Borgia's collection	Giglioli (1913), 3.

	hand and resting left on shield.		was mainly assembled from objects found in Rome, these moulds are believed to come from the city.	
28	106x102mm mould for 3 square tokens of ca. 12.5x13mm carrying the legend **AF above P** and 3 tokens in the shape of a *tabula ansata* with the legend **MS above A**.	Rome	As above.	Giglioli (1913), 3.
29	140x70 mm mould for 9 circular tokens all of the same design: **Annona standing with corn-ears in one hand and a cornucopia in the other**.	Rome	The publication simply states 'from recent excavations in Rome'.	Ruggiero (1878), no. 1.
30	No further information given.		From a tufa quarry on the property of 'Cav. Piacentini', between the 8th and 9th kilometre to the left of the via Flaminia. A short distance away was the remains of walls in *opus reticulatum* and a mosaic floor, likely the remains of a Roman villa.	*NSc.* (1907), 348.
31	170x111mm mould for 11 circular tokens of (diameter not given), all of the same design: **CT**.	Ostia	Found in the fill during excavations on the street parallel to the Capitolium ('temple of Vulcan').	*NSc.* (1908), 332; Ostia Antiquarium inv. 589.
32	90x80mm mould for 7 circular (?) tokens of ca. 13mm all of the same	Ostia	Uncovered in the section of the	*NSc.* (1913),

	design: **Fortuna standing with rudder and cornucopia.**		decumanus up to the via della Pistrina (via dei Molini).	216; Ostia Antiquarium inv. no. 7572.
33	145x125mm mould fragment for 11 circular tokens of 11mm (of which three are missing – the lower right corner has broken off), all decorated with the **head of Serapis**.	Ostia	Excavations along the via di Diana, including the SW corner of the House of Diana.	*Giornale degli Scavi*, vol. 8, (1915), 45; Ostia Antiquarium inv. no. 9535.
34	80x81 mm mould for 8 circular tokens (no diameter given), all of the same design: **cornucopia within a wreath**.	Ostia	Finds from work on the northern side of the street that runs along the wall north of the Caserma dei Vigili.	*NSc.* (1912), 277; Ostia Antiquarium inv. no. 5776.
35	147x95mm mould for 9 circular tokens of 13mm, all of the same design: **F**.	Ostia	Excavations along the street and in the Caserma dei Vigili.	*NSc.* (1911), 367; Ostia Antiquarium inv. no. 4377.
36	135x95mm mould for circular tokens (number not specified) of ca. 15mm all of the same design: the letter **E**.	Ostia	Found while clearing the earth from a house on the via della Fontana (‘casa della via della Fontana’).	*NSc.* (1907), 18.
37	150x100mm mould for 7 square tokens of 13x12mm, all of the same design: **5 pellets**.	Ostia	Found above the covered corridor at the entrance of the casa dei dipinti along the via della Fontana.	*NSc.* (1913), 78.
38	110x110mm mould for 7 oval tokens	Ostia	Found during the	*NSc.*

	of ca. 9mm of **uncertain design**.		clearing of earth from the casa della via della Fontana.	(1907), 121.
39	Palombino mould for 9 square tokens of 8x8mm, decorated with **three pellets**.	Ostia	Excavations from the Terme Peristyle to the via della Fontana.	*NSc.* (1909), 200.
40	107x91mm mould for 5 tokens (shape not given, presumably circular). The three token moulds to the right of the central channel are decorated with **IV**, and the two on the left with a **palm branch**.	Ostia	Excavations of two *tabernae* (4, 5) along the decumanus between the via della Fontana and via dei Molini.	*Giornale degli Scavi*, vol. 7, (1914), 30; Ostia Antiquarium inv. no. 8701.
41	Mould for 7 tokens (shape not given, presumably circular), all of the same design: **an eagle**.	Ostia	Excavations of the land that formerly belonged to the Aldobrandini family and which was acquired through expropriation. This is in all probability Ostia Antiquarium inv. no. 12544, which is a mould for 7 circular tokens showing an eagle with wings spread and which has no associated find information.	*NSc.* (1918), 132. See also Spagnoli (2017), pl. VI, no. 4.
42	90x43mm mould fragment for 5 square tokens of ca. 7x6mm showing **a standing figure holding a sceptre in his left hand** and 5 triangular tokens of ca. 9mm with the design	Ostia	Fill from the west side of via delle Corporazioni.	*NSc.* (1913), 132; Ostia Antiquarium inv. no.

	ΦΛ.			7034.
43	110x100mm mould for 9 circular tokens of ca. 5mm, the design is **blank**.	Ostia	Piazzale delle Corporazioni: excavation of the portico behind the theatre on the east side of the piazzale.	*NSc.* (1912), 437; Ostia Antiquarium inv. no. 6309bis.
44	100x100mm mould with the outline of 7 square 10x10mm tokens sketched.	Ostia	Theatre. Found in the same stratum as a marble bust with an Antonine hairstyle.	*NSc.* (1913), 396; Ostia Antiquarium inv. no. 8367.
45	124x145mm mould for 9 round *tesserae* of 9mm, the design is **blank**.	Ostia	Theatre: at the back of the second taberna in the NE corner.	*NSc.* (1913), 132.
46	185mm mould for two series of (circular?) tokens of 10mm with the letters **IV**.	Ostia	Theatre: at the back of the third taberna, beginning from the NW corner. From a fire stratum that had a large quantity of dumped marble including the torso of a Nereid and other statues.	*NSc.* (1913), 296–99; Ostia Antiquarium inv. no. 8156
47	125x95mm mould for 6 circular tokens, all of the same design: **P**.	Ostia	Excavation of the fill that came from around the theatre.	*NSc.* (1910), 185; Ostia Antiquarium inv. no. 2939.
48	152mm hexagonal mould for 9 tokens (shape not given, presumably circular), all of the same design: **C**.	Ostia	From excavations associated with the installation of the	*Giornale degli Scavi*, vol.

			railroad on the outside of the theatre and to the right of the sewer that came from the latrines.	3, (1910), 162; Ostia Antiquarium inv. no. 3282.
49	145x72mm mould for 9 tokens (shape not given, presumably circular), all of the same design: **L**.	Ostia	As above.	*Giornale degli Scavi*, vol. 3, (1910), 163; Ostia Antiquarium inv. no. 3283.
50	161x90x15mm mould of Luna marble for 8 square tokens, all with the same design**: an anthropomorphic figure holding a sceptre (?), with a container (modius?) between the legs (?).**	Ostia	Insula delle Ierodule, found in a corridor in a stratum of abandonment.	Falzone and Pellegrino (2014), 364.
51	178x178mm octogonal-shaped full mould (both halves) for 11 circular tokens decorated with the letter **P** on each side.	Ostia	A workshop along the eastern side of the cardo maximus, opposite the Thermes du Phare (Baths of the Lighthouse).	Spagnoli (2001); Ostia Antiquarium inv. nos. 5920 a–b.
52	Fragment of a mould of Luna marble (no measurements given), for a single circular token of ca. 10mm showing a **beetle**.	Ostia	From Stratum I of Ambiente XVI of the excavations of the Terme del Nuotatore (stratum dated from the middle of the 3rd century to the end of the 4th century AD).	Carandini and Panella (1977), 271.
53	77mm mould fragment for 4 circular	Ostia	In the NE corner of the	*NSc.*

	tokens of ca. 12mm decorated with a **small altar** (?).		Sabazeum.	(1909), 23.
54	No further information given.	Ostia	Reported in the letters of Visconti, along with other small objects.	*Lettere di Visconti* 1855–1870, p. 131, 31 January 1866.
55	145x70mm mould of uncertain material for 9 circular tokens of ca. 10mm, all of the same design: **A**.	Ostia	No further information known.	TURS 3594
56	140x110mm mould of uncertain material for 9 circular tokens of different sizes (15–17mm) all of the same design: **lituus**.	Ostia	No further information known.	TURS 3596
57	165x145mm mould of uncertain material for 9 circular tokens of different sizes (13–15mm), all of the same design: **crossed cornucopiae**.	Ostia	No further information known.	TURS 3597
58	160x140mm mould of uncertain material for 9 circular tokens of ca. 15mm, all of the same design: **modius**.	Ostia	No further information known.	TURS 3598
59	Fragment of a mould half; the surviving fragment is for one circular token of 20mm decorated with **Aequitas holding cornucopia and a pair of scales**.	Ostia	No further information known.	Spagnoli (2017), pl. VI, no. 5; Ostia Antiquarium inv. no. 5905.

60	Fragment of a mould half; the surviving fragment is for two circular tokens of 20mm decorated with **head of Serapis**.	Ostia	No further information known.	Spagnoli (2017), pl. VI, no. 6; Ostia Antiquarium inv. no. 12543.
61	120x80mm mould of Luna marble for 8 circular tokens of different sizes (7–12mm), all of the same design: **a cross**.	Ostia (?)[56]	Stray finds collected by individuals (including metal detectorists) from the earth moved to the surrounding fields of the city during earlier excavations.	Pensabene (2001–2003), 501.

List of figures

Fig. 1: Example of a Roman cast lead token (Ø 16mm, 2.77g, 12h). Side A: Modius (container of grain). Side B: Three Graces. TURS 358 (pl. III, no. 57) (courtesy of Heberden Coin Room, Ashmolean Museum).

Fig. 2: Half of a palombino marble mould. The mould would have created seven circular tokens decorated with the image of the goddess Fortuna holding a cornucopia and rudder (108 x 76 x 29mm, 389.2g) (inv. no. 2008.118) (courtesy of Harvard Art Museums).

Fig. 3a–b: A palombino marble mould with both halves, 93 x 96mm (inv. nos. 64247.2.1–2) (Vatican Museums). The tokens produced from these moulds would have ranged in size from 9–12mm. Figure 3a is engraved with an image of Fortuna, and Figure 3b with two different designs: an ant and two figures (Mars and Venus?) (Cesano (1904a), 148–9) (courtesy of Vatican Museums).

[56] Although Pensabene publishes the find as from Ostia, the full (unpublished) corpus of the material suggests that the illegal excavations may have taken place over a broader region.

Fig. 4: Side of a token mould showing grooves (76 x 29mm) (inv. no. 2008.118) (courtesy of Harvard Art Museums, inv. no. 2008.118) (photo by author).

Fig. 5: Detail of the top left of a mould showing two concentric circles (inv. no. 2008.118) (courtesy of Harvard Art Museums) (photo by author).

Fig. 6: Lead token demonstrating the central 'dot' resulting from the mould creation process (Ø 20mm, 3.95g, 12h). Side A: Head of Janus. Side B: MCC (Ficoroni 1740, part II, p. 120, XVII, no. 3) (courtesy of Heberden Coin Room, Ashmolean Museum).

Fig. 7: Lead token (Ø 19mm, 5.14 g, 11h). Side A: F C. Side B: A *furca* or stylised caduceus with a star on either side. TURS 3065 (courtesy of Heberden Coin Room, Ashmolean Museum).

Fig. 8: (Post)medieval stone mould for casting lead tokens (58.4 x 56.7 x 19.35mm) (courtesy of the Portable Antiquities Scheme, LON-E0BD25) (https://finds.org.uk/database/artefacts/record/id/745434; accessed 07/06/2019).

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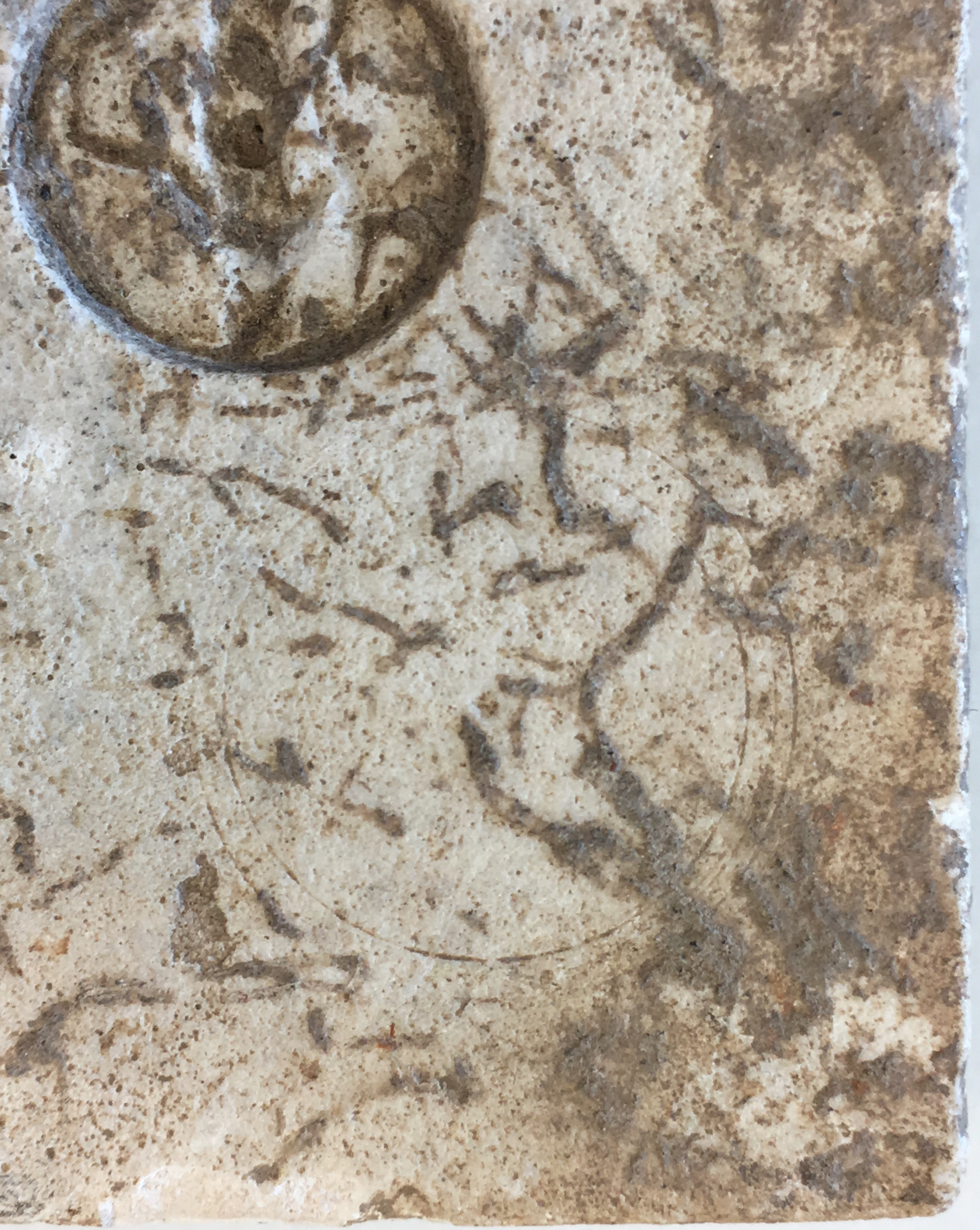


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