

## RADIOCARBON DATING OF SEVERAL ANCIENT JEWISH OIL LAMPS FROM ROME

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**ABSTRACT.** In this paper, we discuss how the radiocarbon dating of soot on oil lamps can help determine the chronology of the Jewish catacombs of Rome. We also explore the ramifications of our work for the typological study of Roman period terracotta lamps.

### INTRODUCTION

In the Vatican museums, a small collection of Jewish oil lamps has been preserved. They derive from what is thought to be the oldest Jewish catacomb of Rome, the so-called Monteverde catacomb, which some scholars believe dates to the 1st century AD (Müller 1912; Frey 1936; Leon 1960; Smallwood 1976; Williams 1994). The evidence adduced in support of this view consists of tiles that were used to seal the graves. Eighteen of these tiles carry stamps that are dated to the 1st century AD. However, these tiles were not produced for the catacombs specifically; rather, they constitute reused materials. Therefore, the tiles do not provide us with reliable evidence for dating of this catacomb (Rutgers 1998). Most archaeological evidence deriving from the Monteverde catacomb consistently dates to the 3rd and 4th centuries AD. This evidence includes funerary inscriptions whose linguistic and onomastic characteristics are typical of this later period (Rutgers 1995). There also exists a coin dating to the reign of Emperor Constantius II (AD 337–340) (Müller 1912). Finally, the lamps discussed in this article also document that the Monteverde catacomb was used intensively during the Late Antique period.

However, all of this evidence should not be interpreted to mean that the excavator, Nikolaus Müller, was incorrect in designating this site as “the oldest Jewish cemetery of the West” (Müller 1912, 1915). A brief glance at the map of the catacomb (Müller 1915) explains why no earlier archaeological evidence survives. When Müller excavated the catacomb, it had already been partially destroyed. In front of the area Müller excavated, there was an enormous cavity. This cavity had come into existence as a result of the quarrying of tuff. By the time Müller began digging, quarrying had already destroyed an unknown number of the catacomb’s galleries. Thus, only the catacomb’s posterior part survived at the time of excavation. It should not be surprising that the archaeological materials discovered in this part of the catacomb are all uniformly Late Antique. In catacombs, galleries furthest away from the entrance always date to a more recent period in time than galleries dug next to its entrance. In short, and despite the lack of relevant archaeological evidence, it is still quite conceivable that the Monteverde catacomb is the oldest Jewish catacomb in the city.

The lamps discussed in this article have all been dated to the second half of the 4th century AD on the basis of their typology (Paleani 1994). It must be noted, however, that 4 lamps in this collection carry a unique representation on their discus that cannot be dated very precisely using typology. This representation consists of a 5-branched candelabrum on a circular base.

Recently, an additional 2 lamps with representations of this kind have been discovered. One has been preserved in the archaeological museum of Sassari, on Sardinia. It has also been dated to the 4th century AD, presumably because of its similarity to Roman counterparts (Perani 2003). The

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other lamp, belonging to the same iconographical type but of unknown provenance, has been preserved in the storage rooms of the Museo Nazionale Romano in Rome. This latter lamp has been dated to a slightly later period, namely to the first half of the 5th century AD (Barbera et al. 2001).

Having attained excellent results in the dating of Roman period oil lamps by radiocarbon dating of the soot on the lamp's nozzle (Rutgers et al. 2006), we decided to subject the 4 lamps from the Vatican collections to a similar procedure.

## METHODS AND DESCRIPTIVE BACKGROUND

In December of 1602, a Jewish catacomb was discovered south of Trastevere, in an area known as Monteverde, near the actual *stazione di Trastevere*. According to the earliest published report, it contained various types of archaeological materials, including large amounts of pottery lamps (Bosio 1632; Ghilardi 2003). Knowledge of the catacomb's precise location was subsequently lost (Leon 1928). In the early 20th century, parts of the catacomb were rediscovered and excavated. During the excavations, hundreds of terracotta oil lamps were unearthed (Müller 1912, 1915). It remains unclear what happened to all these lamps once the excavations had been completed; only 5 lamps survived whose origin can be traced back to the Monteverde catacomb. They were a gift of the proprietors of the site to the Vatican museums. The lamps were entered into the museum's inventory books as inventory nr 38108–38112 (cf. our identifiers in Table 1) on 16 December 1904. In later years, the Monteverde catacomb suffered badly from collapse, and by 1928 it had vanished completely. Because the excavation report is not very specific, we could not reconstruct the exact location in which the lamps discussed here were found. There can be no doubt, however, that the lamps were originally discovered in the Jewish Monteverde catacomb, because this fact was made explicit by the excavator (Müller 1912).

The lamps analyzed here all were mould-made. They were produced locally, i.e. in or near Rome. The lamps' decoration, namely a 5-branched candelabrum, is unusual but not exceptional. It is a variant of the 7-branched candelabrum, or menorah, used in the Temple of Jerusalem. In Roman times, this candelabrum appeared on many Jewish artifacts, becoming Judaism's symbol par excellence (Hachili 2001). The fact that the candelabrum on our lamps displays 5 instead of 7 branches can be explained by taking into account the character of the workshop that produced it. Workshops of this kind were not specifically and exclusively Jewish. Rather, they produced for Jewish, Christian, and pagan customers alike (Rutgers 1995). As a result, small mistakes resulting either from unfamiliarity with Jewish symbols or from poor communication were possible.

All lamps have pierced nozzles that served to hold a wick. These wicks have disappeared; however, the flame produced by the wicks has left a thin layer of soot around the wick hole. In the case of 3 out of 4 lamps, we succeeded in removing this soot from the nozzle. This was done in the laboratory of the Vatican museums. It was then taken to the Utrecht Accelerator Mass Spectrometry (AMS) facility, where samples were pretreated according to standard procedures, combusted to CO<sub>2</sub>, and reduced to graphite for <sup>14</sup>C AMS analysis (van der Borg et al. 1997).

## RESULTS AND DISCUSSION

Table 1 lists the results of dating for the lamps, with <sup>14</sup>C ages ranging from 1739 to 1659 BP, corresponding to cal AD 170–530 (2  $\sigma$ ). A closer look suggests that most of these lamps were probably from the 3rd to early 5th century AD. Such results indicate that the traditional typological dating to the second half of the 4th century AD (Provoost 1970: type 8K), as opposed to a more recent one that favors the first half of the 5th century (Barbera et al. 2001), are both correct.

Table 1 Results of <sup>14</sup>C dating for the lamps.

Sample name	Mass (mg C)	Lab code (UtC-)	δ <sup>13</sup> C (‰) <sup>a</sup>	Age <sup>14</sup> C (yr BP) <sup>b</sup>	2-σ calibrated age (yr)
Vatican lamp 38112A	1.620	13409	-27.0	1659 ± 47	cal AD 260–300, 320–470, 480–530
Vatican lamp 38110	0.860	14297	-26.7	1690 ± 50	cal AD 230–440, 490–530
Vatican lamp 38108	0.330	14298	-24.5	1739 ± 43	cal AD 170–190, 210–410

<sup>a</sup>From gas mass spectrometer analysis by Department of Earth Sciences, Utrecht University.

<sup>b</sup>Calibrated using CALIB v 5.0 (Stuiver et al. 2005).

Our dating is also chronologically consistent with other lamp evidence from the Monteverde catacomb. In his report, the excavator, Nikolaus Müller, observed that the hundreds of other lamps he discovered all belonged to a standard Late Antique type (Müller 1912). Whether such an observation is entirely correct can no longer be determined. While lamp typology was still in its infancy in 1912, Müller never bothered to include either drawings or photographs of these “lost lamps” in his final report. However, Müller also observed that some lamps carried the signature SA on their base. This signature is well known: it appears on the base of lamps of the fat-globule type. Such lamps were produced in or near Rome in the 3rd and 4th centuries AD (Bailey 1980: type R; for <sup>14</sup>C dating of soot on the nozzle of a flat globular lamp, confirming a Late Antique date, see Rutgers et al. [2006]).

Our results have important ramifications in 2 areas: the dating of the Jewish catacombs of Rome and the dating of terracotta lamps. With regard to the Jewish catacombs of Rome, our results are significant in that they show that almost half a millennium after Jews had first arrived in Trastevere (Philo, *Embassy* 23), and despite the fact that the Christianization of the Roman Empire was well underway, a vibrant Jewish community still continued to dwell and bury its dead there (Figure 1).

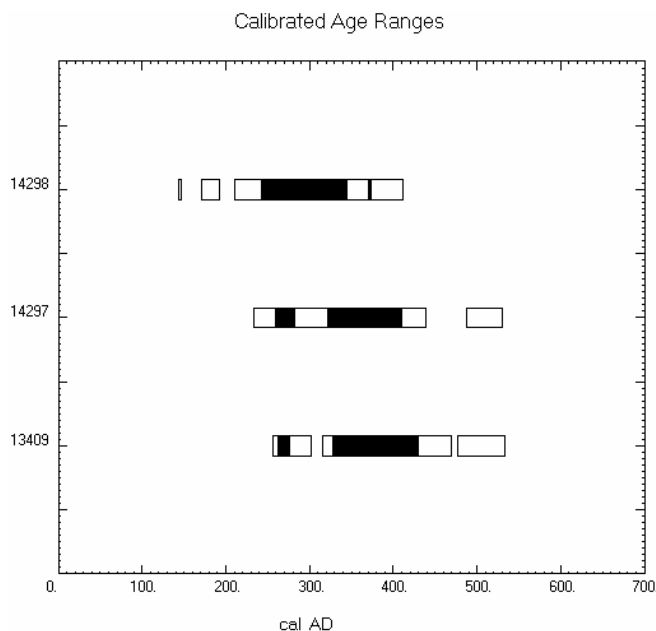


Figure 1 Multiplot of calibrated results for the oil lamps listed in Table 1. Traditional dating using typological criteria suggests a date in the second half of the 4th or the first half of the 5th century AD.

With regard to pottery studies, the following may be observed. Pottery lamps fulfill an important role in the dating of archaeological sites. They are also crucially important for reconstructing the economy of the Roman Empire (Harris 1980; Anselmino 1986; Saguì 2001). The dating of the lamps themselves is frequently performed on the basis of, or in reference to, lamp typologies. Although there is nothing fundamentally wrong with such a procedure, there are cases where this results in circular reasoning. This happens when lamps are used to date archaeological contexts that fail to produce other datable materials. (It is the archaeological context that should date the lamp, and thus help refine lamp typologies, rather than vice versa.)

$^{14}\text{C}$  dating of soot preserved on a lamp's nozzle as proposed here has 2 distinct advantages. By producing reliable results, such  $^{14}\text{C}$  dating enables us to test independently the validity of the standard typologies used regularly by archaeologists.  $^{14}\text{C}$  dating also allows us to determine when lamps were actually used (as opposed to establishing when they were made). This latter point is particularly important when lamps are used for dating the archaeological contexts in which they are found.

## CONCLUSION

$^{14}\text{C}$  dating has proved to be a powerful tool for dating materials from the Jewish catacombs of Rome (Rutgers et al. 2002, 2005). Thus, it has helped to refine our understanding of the age-old history of the Jewish community in that city. Here, we have shown that  $^{14}\text{C}$  dating can be used profitably in the study of ancient terracotta lamps.  $^{14}\text{C}$  dating necessarily results in ranges that are fairly wide from an archaeological perspective—even though the ranges are not wider than the datings that have traditionally been proposed for pottery lamps using typology.  $^{14}\text{C}$  dating has 2 advantages over more traditional dating methods: its results are more reliable and it provides one with a means to determine when a lamp was last used. Thus,  $^{14}\text{C}$  dating of pottery lamps has the potential to provide independent evidence to help refine existing lamp typologies.

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## REFERENCES

- Anselmino L. 1986. Le lucerne tardoantiche: produzione e cronologia. In: Giardina A, editor. *Società Romana e Impero Tardoantico. III. Le Merci. Gli Insediamenti*. Rome: Laterza. p 227–40. In Italian.
- Bailey DM. 1980. *A Catalogue of Lamps in the British Museum. Volume 2. Roman Lamps Made in Italy*. London: British Museum. 704 p.
- Barbera M, Pacetti M, Vatta G, Fraiegari P. 2001. Lucerne. In: Arena MS, Delogu P, Paroli L, Ricci M, Saguì L, Venditelli L, editors. *Roma. Dall'Antichità al Medioevo*. Milano: Archeologia e Storia. p 184–93. In Italian.
- Bosio A. 1632. *Roma Sotterranea*. Rome. In Italian.
- Frey JB. 1936. L'ancienneté des catacombs juives à Rome. *Rendiconti della Pontificia Accademia* 7:185–98. In French.
- Ghilardi M. 2003. Del cimitero degli antichi Ebrei: la catacomba ebraica di Monteverde nel IV centenario della scoperta. *Studi Romani* 51(1–2):15–43. In Italian.
- Hachili R. 2001. *The Menorah, the Ancient Seven-Armed Candelabrum: Origin, Form and Significance*. Leiden: Brill. 539 p.
- Harris WV. 1980. Roman terracotta lamps: the organization of an industry. *The Journal of Roman Studies* 70: 126–45.
- Leon HJ. 1928. The Jewish catacombs and inscriptions of Rome: an account of their discovery and subsequent history. *Hebrew Union College Annual* 5:299–344.
- Leon HJ. 1960. *The Jews of Ancient Rome*. Philadelphia: Jewish Publication Society of America. 378 p.
- Müller N. 1912. *Die Jüdische Katakomba am Monteverde zu Rom*. Leipzig: Gustav Fock. 142 p. In German.

- Müller N. 1915. Cimitero degli antichi ebrei posto nella via portuense. *Dissertazioni della Pontificia Accademia Romana di Archeologia* 12:205–308. In Italian.
- Paleani MT. 1994. Su alcune lucerne fittili rinvenute nella catacomba ebraica di Monteverde a Roma. In: *Historiam Pictura Refert. Miscellanea in Onore di Padre Alejandro Recio Vegazones O.F.M.* Rome: Pontificio Istituto di Archeologia Cristiana. p 407–23. In Italian.
- Perani M. 2003. Le testimonianze archeologiche sugli ebrei in Sardegna. In: Perani M, editor. *I Beni Culturali in Italia*. Ravenna: De Longo editore. p 147–63. In Italian.
- Provoost A. 1970. Les lampes à recipient allongé trouvées dans les catacombs romaines. *Bulletin de l'Institut Historique Belge de Rome* 41:17–55. In French.
- Rutgers LV. 1995. *The Jews in Late Ancient Rome*. Leiden: Brill. 283 p.
- Rutgers LV. 1998. *The Hidden Heritage of Diaspora Judaism*. Leuven: Peeters. 320 p.
- Rutgers LV, de Jong AFM, van der Borg K. 2002. Radiocarbon dates from the Jewish catacombs of Rome. *Radiocarbon* 44(2):541–7.
- Rutgers LV, van der Borg K, de Jong AFM, Poole I. 2005. Radiocarbon dating: Jewish inspiration of Christian catacombs. *Nature* 436(7049):339.
- Rutgers LV, van der Borg K, de Jong AFM, Provoost A. 2006. Sul problema di come datare le catacombe ebraiche di Roma. *Bulletin Antieke Beschaving* 81:169–84. In Italian.
- Saguì L. 2001. Roma e il mediterraneo: la circolazione delle merci. In: Arena MS, Delogu P, Paroli L, Ricci M, Saguì L, Venditelli L, editors. *Roma: Dall'Antichità al Medioevo*. Milano: Archeologia e Storia. p 62–8. In Italian.
- Smallwood EM. 1976. *The Jews Under Roman Rule*. Leiden: Brill. 595 p.
- Stuiver M, Reimer PJ, Reimer RW. 2005. CALIB 5.0. [WWW program and documentation]. URL: <http://calib.qub.ac.uk/calib/>.
- van der Borg K, Alderliesten C, de Jong AFM, van den Brink A, de Haas AP, Kersemaekers HJH, Raaymakers JEMJ. 1997. Precision and mass fractionation in <sup>14</sup>C analysis with AMS. *Nuclear Instruments and Methods in Physical Research B* 123(1–4):97–101.
- Williams M. 1994. The organisation of Jewish burials in ancient Rome in the light of evidence from Palestine and the Diaspora. *Zeitschrift für Papyrologie und Epigraphik* 101:165–82.