

# Exploring Roman picture lamp breakage rituals in light of mechanical experimentation

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**Abstract:** Intentionally broken “picture” lamps, or *Bildlampen*, are relatively common at archaeological sites throughout the Roman world. Such lamps typically exhibit a missing central discus. The discus itself – called a lamp “medallion” – often survives, too, and represents further evidence for deliberate lamp breakage. This article explores picture lamps with missing discuses and lamp medallions as a distinct and identifiable artifact group. It also surveys the possible reasons behind their intentional breaking. The work additionally identifies selected findspots where the lighting vessels were broken in rituals, with a special focus on the Shrine of Apollo at Tyre, and examines whether lamp breakage reflects individual choice or collective behavior. In an effort to understand how Roman picture lamps were deliberately broken and the lamp medallions generated for rituals, breakage experiments – drop, impact, puncture, and hammerstone – were conducted on accurate museum-made replicas of Roman picture lamps.

**Keywords:** *Bildlampen*, intentional lamp breakage, lamp medallion, ritual, Roman Palestine, Tyre

In antiquity, clay oil lamps played an essential role in religious rituals performed in sacred spaces. They were left as votive offerings of symbolic light to deities in sanctuaries, buried beneath building foundations, deposited in graves, and dropped into caves, cisterns, and wells.<sup>1</sup> Not all cultic practices, however, left clay lamps intact. The intentional breakage of “picture” lamps, or *Bildlampen*, was a relatively common practice across the Roman empire. Such lamps typically exhibit a missing central discus. The extracted discus itself – called a lamp “medallion” – often survives too and represents further evidence for deliberate lamp breakage. The purpose of this article is to explore picture lamps with missing discuses and medallions as a distinct and identifiable artifact group. It identifies selected findspots where they were used in breakage rituals and examines the possible reasons behind their intentional mutilation. This study further shows that although deliberately broken picture lamps are commonly found at sites in Roman Palestine, finds from elsewhere in the Roman world indicate that lamp breaking for religious or practical purposes was not unique to that region.

The article focuses in particular on lychnological evidence recovered from the Shrine of Apollo in Tyre, Lebanon, as it hints at the use of picture lamps in a variety of cultic practices; for example, dropping them into the sanctuary’s wells and basins, as well as intentionally burying them under the Shrine itself. Some lamps also exhibit deliberately broken central discuses. The numerous lamp fragments themselves found inside the sanctuary *may* also represent evidence for collective lamp breakage rituals. This, of course, is

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<sup>1</sup> Whole lamps numbering in the thousands have been found at sanctuaries, like, for example, the approximately 4,000 lamps left by worshippers at the “Fountain of the Lamps” at Corinth (Garnett 1975, 173–206) and over 60,000 miniature lamps (some as small as 1.2 cm × 2.9 cm) at the Sanctuary of Demeter at Kaunos (Bulba 2019, 32–39, figs. 1–6). Also see Lapp 2022, 134. For discussions on the ritualistic use of light and the symbolic role lamps played in cultic practices, see Eckardt 2002, 95–115; Hensen 2009, 427; Hanut 2014, 50–56; Lapp 2021, 417–23, figs. 20.2 and 20.3.

difficult to substantiate, depending on the context. That said, we should not exclude the sherds from our analysis and should at least attempt to glean as much information from them as we can. The Shrine additionally helps us understand whether there is a relationship between the meaning of the discus motifs and the cultic purpose of the sanctuary itself.

To better understand how Roman picture lamps were intentionally broken and their lamp medallions generated, I performed my own lamp breakage “rituals” using accurate British Museum-made replicas cast from an original Roman picture lamp.<sup>2</sup> Hammerstone, puncture, drop, and impact experiments were conducted on the replicas. The objective of the hammerstone and puncture tests was to create a picture lamp with a missing discus without destroying the lighting vessel and perhaps even to produce a lamp medallion. These represent the techniques most plausibly used to break the central discus. Because large numbers of lamp sherds are often recovered from sanctuaries, two additional breakage experiments – drop and impact – were conducted to accommodate the possibility that worshippers intentionally dropped or struck the lighting devices in some sort of “lamp-killing” ritual.

The experiments were also performed to observe how picture lamps break, including the quantity and types of fragments produced. This is helpful knowledge when applying Diedre Barrett’s mean weight analysis<sup>3</sup> to determine the estimated quantity of complete lamps originally used inside a sanctuary and to aid in the reconstruction of lighting scenarios in sacred spaces, such as *lararia*, using 3D simulation.<sup>4</sup> This information is also essential for recreating the exact geographic coordinates of intact lamps, fragments, and medallions using GIS digitalization.<sup>5</sup> An additional goal of the tests was to gauge the degree of breakage suffered by a complete picture lamp when dropped, which parts of the lamp’s morphology sustained the most significant damage, and which parts were best or fully preserved. Before presenting the results of the breakage experiments, the archaeological evidence for lamp breakage is explored, including the contexts of lamps with missing discuses and lamp medallions; the connection – if any – between the motifs pictured on the medallions and the findspots; and the reasons why ancient worshippers, among others, would break their lamps.

### Picture lamp breakage: the evidence

“Picture” lamps – or *Bildlampen* as the type was first coined by Otto Fischbach in 1896 in recognition of the diverse motifs that often decorate their central discuses<sup>6</sup> – reigned supreme as the lamp type of choice for religious offertory rituals in the Roman period,

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<sup>2</sup> The results were first presented in my unpublished paper, “Exploring ritual discus lamp breakage and lamp medallion creation in light of hammerstone, puncture, impact, and drop experiments,” read in absentia at the Clay Oil Lamps in the Roman Eastern Provinces – Production, Art, and Distribution: International Researchers’ Symposium Honoring Prof. James F. Strange, held at Kinneret College, Israel, on 13–15 December 2017.

<sup>3</sup> Barrett 2008, 52, 62–63, appendix, figs. 7.20, 7.21, 7.22 ii, 7.23.

<sup>4</sup> Schoueri and Teixeira-Bastos 2021, 502, 504–5, 509–11, figs. 6–9.

<sup>5</sup> Acevedo et al. 2001, 493–597.

<sup>6</sup> Fischbach 1896, 3–64; Eckardt 2002, 19.

as their widespread distribution and abundance confirm.<sup>7</sup> Nearly every region of the Roman world manufactured one or more versions of this group.<sup>8</sup> Picture lamps correspond to Broneer Types XXI–XXV and Loeschcke Gruppen I–VIII.<sup>9</sup> They are characterized by a round body with a central concave discus that typically contains a motif in high relief. The nozzle can be relatively long and spatulated, or short and rounded. Lamp-makers' marks, names, or initials occur on many bases. Not only did picture lamps provide mobile artificial lighting, they also served as a medium via which Greco-Roman mythological themes were spread widely and had a "pollinating" effect across urban and rural populations.<sup>10</sup> In essence, their discus-scenes employed a pictorial language that could be understood by a mostly non-literate population.

It has been well established that the most common and identifiable archaeological evidence for intentional lamp breakage is (1) picture lamps with missing discuses and (2) lamp "medallions" (Fig. 1).<sup>11</sup> The central discus of the picture lamp made it ideal for ritual: not only might the image on it have held symbolic meaning for the lamp user, but its thin-



Fig. 1. *Tarsus picture lamp with missing discus and its medallion showing Athena. Sinda (?), Cyprus. The Louvre, accession no. AM 1644. (Courtesy the Louvre.)*

ness also ensured easy destruction in breakage rituals. Given its special feature of carrying mythological imagery, this lamp type may have been manufactured exclusively for cultic rites. That picture lamps with missing discuses are found in various and mostly identifiable Roman religious cultic contexts suggests their role in religious offertory breakage rituals. The discus motifs on the medallions also generally belong to the standard repertoire of Roman religious cults. It is plausible that picture lamps were also used for magic in some contexts, but the overall absence of mirror-writing, retrograde inscriptions, or curses generally suggests otherwise.<sup>12</sup> Determining whether a picture lamp was intentionally

<sup>7</sup> Lapp 2017, 768–71.

<sup>8</sup> For examples from Italy, Gaul, Greece, Asia Minor, Egypt, and the Levant, see Bailey 1988, 3–94, pls. 1–5, 12–15, 32–34, 36, 42–45, 57–58, 62–70, 72, 74–75, 84–96, 99, 101–4, 116–17, 119; Eckardt 2002, 117–33, 179–88, figs. 72–77 (Roman Britain); Rosenthal and Sivan 1978, 85–90, nos. 347–67 (Roman Palestine); Chrzanovski 2019, 365–76 (Egypt).

<sup>9</sup> Broneer 1930; Loeschcke 1919, 23–66.

<sup>10</sup> Lapp 2016, 182, 200.

<sup>11</sup> Sivan 1982, 115–16; Tal and Bastos 2012, 105, fig. 1 (Apollonia-Arsuf), 107, fig. 2:3–4 (Sajur), fig. 3:1 (Ginnegar), 108, fig. 4:1–3 (Asherat); Tal and Bastos 2015, 345–68; Tal and Taxel 2017, 181–96. For a typology of the differently shaped openings resulting from the breakage and extraction of the discuses, see Tal and Bastos 2015, 346–47. Chrzanovski 2020, 222 (Arles-Rhone 3).

<sup>12</sup> Late Roman magic lamps with spells were unearthed at cemeteries in Nubia (Žurawski 1992, 98). On magic lamps, see Zografou 2010, 276–94. Apart from lamp-makers' marks and initials, though, Roman picture lamps manufactured between the 1st and 3rd c. CE typically do not carry inscriptions.



Fig. 2. *Palestinian picture lamp with intentionally broken and missing discus. Late 1st–3rd c. CE. Northern Cemetery, Beth Shean (Beisan)/Scythopolis, Israel. Penn Museum no. 29-102-253. (Courtesy the Penn Museum.)*

broken as an act of religious cult or magic will depend on the artifact's archaeological context, any associated textual evidence, and the excavator's scholarly opinion on what constitutes "magic."<sup>13</sup>

#### *Picture lamps with missing discuses*

The most widespread distribution and greatest quantity of picture lamps with missing discuses are found at sites in Roman Palestine. The majority of these lamps were manufactured in local workshops.<sup>14</sup> A deliberately broken picture lamp can typically be identified by a large, relatively circular hole with jagged edges located where the original discus once existed. A Palestinian discus lamp recovered from the Northern Cemetery at the Decapolis city of Beth Shean/Scythopolis, Israel, superbly exhibits these characteristics (Fig. 2).<sup>15</sup> The molded motif (indiscernible) on the central discus has been intentionally broken in characteristic fashion. One

of the largest deposits of Palestinian picture lamps like the Beth Shean example – over 600 lamps in all – was exposed at the *villa maritima* and dumps at Apollonia-Arsuf.<sup>16</sup> Although Apollonia had a predominantly Samaritan and early Christian population,<sup>17</sup> it should not be ruled out that pagan residents of the city deliberately mutilated picture lamps, as their counterparts did at shrines outside Roman Palestine. Additional examples with intentionally broken discuses were unearthed in tabernae and a Roman house on the *cardo* at the coastal site of Antipatris/Tell Aphek and at Beth Shean/Scythopolis.<sup>18</sup> Other Palestinian picture lamps with missing discuses have been excavated at Tyre and as far west as Athens.<sup>19</sup> Many were recovered from Te'omim

<sup>13</sup> Some scholars even argue that magic simply does not exist and that it is indistinguishable from religion. See Gager 1992, 12, 24–25. On the difficulties of differentiating between magic and religion with respect to amulets, Pummer 2020, 82, 85, 88, 91, 102.

<sup>14</sup> This specific picture lamp group corresponds to Sussman Type R20 "Provincial" Syria-Palaestina. Sussman 2008, 229–31, nos. 71–86; Sussman 2012, VIII. Local Syria-Palestinian short-nozzle oil lamps, i.e., R24, 55–59, fig. 48; and Kennedy 1963, 67–115, type 5. Bailey 1988, 284–85, Q2298–99, 2303–5, 2307, pl. 58. For comparative petrographic characteristics and chemical compositions of Palestinian picture lamps from sites in Israel and Jordan, see Lapp 2016, 164–65, 167–68, 178–79, figs. 14–17.

<sup>15</sup> The lamp dating to the late 1st to 3rd c. CE was excavated by the University of Pennsylvania Expedition to Beth Shean (Beisan) under the direction of Clarence Fisher in 1921–28. Over 200 tombs dating from the Bronze Age to the Byzantine period were excavated, but the contents of the rock-cut tombs from the Roman and Byzantine periods remain unpublished (Avery 2013, 28–32).

<sup>16</sup> Tal and Taxel 2017, 181–96.

<sup>17</sup> Sussman 1983, 71.

<sup>18</sup> Neidinger 1982, 166. Hadad 2002, 16, 20, nos. 20, 22, 25–26 (Hadad Type 7).

<sup>19</sup> Perlzweig 1961, 84, no. 133, pl. 5; Bikai et al. 1996, 65, no. 67.

## Roman picture lamp breakage rituals

Cave, located in the southern hills of Jerusalem, and were probably deposited there by pagans as offerings to chthonic gods.<sup>20</sup> Picture lamp breaking appears to have been more common among rural communities than urban ones in Roman Palestine.<sup>21</sup>

The central discuses of picture lamps were also deliberately broken in Jewish ritual contexts in Roman Palestine.<sup>22</sup> Several such lamps with missing discuses were recovered, for instance, from a Jewish burial cave at Qiryat Tiv'on in Galilee.<sup>23</sup> Additional examples were unearthed from cistern C-1068, located in the Jewish domestic area of the lower Galilean city of Sepphoris.<sup>24</sup> The lamps represent plausible evidence of a breakage ritual whereby the central discuses were intentionally broken and the lamps were tossed into the cistern, possibly by the residents of the city's Jewish quarter. More picture lamps with missing discuses were found in other contexts at the site.<sup>25</sup>

A Palestinian picture lamp with a deliberately broken discus was also recovered from the fill of a cistern (Area C-6, locus 6001) at the ancient Meiron synagogue in Upper Galilee.<sup>26</sup> It is no coincidence that numerous complete lamps and lamp fragments were found in the cistern, more so than from any other such cavity at the site.<sup>27</sup> They likely represent evidence for lamp breakage rituals wherein the lighting vessels were intentionally broken and tossed into the cistern, perhaps as offerings of symbolic light to placate chthonic demons. Ancient literary sources mention ceremonial acts conducted in association with cisterns and eschatological links connecting cisterns and pits to the world beyond. Erwin Goodenough, for example, cites a rabbinic passage in which R. Jose observes that the cavity of the cistern reached down into Sheol, the "abyss."<sup>28</sup> Rabbinic sources also mention regulations as they pertain to heave-offerings of wine or oil taken from cisterns.<sup>29</sup>

Picture lamps with missing discuses have also been excavated at pagan findspots outside Roman Palestine. At Petra, for example, several locally made Nabataean picture lamps exhibit probable deliberate breakage.<sup>30</sup> In Cyprus, two picture lamps reportedly recovered from tombs are telling examples of probable intentional breakage. Remarkably, they were discovered with their actual extracted medallions, one showing Odysseus hiding under a ram,<sup>31</sup> and the other depicting Athena grasping a shield (see Fig. 1).<sup>32</sup> Lamps with missing

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<sup>20</sup> Zissu et al. 2017, 114, 117–20, 124–26, figs. 8.5, 8.6, 8.12, and 8.16.

<sup>21</sup> Tal and Bastos 2012, 106, n. 2.

<sup>22</sup> Tal and Bastos 2012, 104–8.

<sup>23</sup> Vitto 2011, 27–61, fig. 24:2; also figs. 23:1–3, 24:1–4, and 25:1–4.

<sup>24</sup> Lapp 2016, 68–72, nos. 123–24, 129–31, 135–37.

<sup>25</sup> Lapp 2016, 127–28, 141–42, nos. 123–24, 129–31, 135–37.

<sup>26</sup> Meyers et al. 1981, 103, 258, pl. 9.16:2.

<sup>27</sup> Meyers et al. 1981, 103.

<sup>28</sup> Goodenough 1955, 153.

<sup>29</sup> Neusner 1977, 342, *Tebul Yom* 2:15. A heave-offering (Hebrew *terumah*, "lift up") is an offering to God.

<sup>30</sup> Grawehr 2006, 313, no. 271; 317, no. 299; 320, nos. 315, 318 (erotic scene); 331, no. 410.

<sup>31</sup> Bailey 1988, 36, Q 2482. The lamp and medallion with Odysseus date from 90–150 CE and were excavated at Kourion or Salamis. They are currently located in the British Museum.

<sup>32</sup> Based on a similar Tarsus lamp with an erotic scene excavated at Salamis, Cyprus (see Bailey 1988, 319, 322, Q2628, fig. 79, pl. 72), the lamp and medallion with Athena belong to



discuses have also been discovered at Pergamon.<sup>33</sup> Two picture lamps (Loeschcke VIII) excavated at Ephesus in the 1860s exhibit deliberately broken discuses, too.<sup>34</sup> In southern France, intentionally extracted central discuses of picture lamps (Loeschcke I) were recovered from the cultic sites of Lachau and La Bâtie-Montsaléon in Hautes-Alpes.<sup>35</sup> Two picture lamps with broken discuses were reportedly found in Italy.<sup>36</sup> Another belonging to Broneer XXII/Loeschcke Ib was recovered from an infant's grave (XXXI) at Gerulata in Pannonia.<sup>37</sup> Several locally produced Pontic picture lamps with broken discuses were excavated in a Jewish context in the Crimea: the 5th–6th c. synagogue at Chersonesos.<sup>38</sup>

### *Lamp medallions*

Lamp medallions represent another common type of identifiable evidence for intentional picture lamp breakage. These are the concave discuses of picture lamps deliberately broken and removed by a lamp user. Although they are commonly referred to as discuses,<sup>39</sup> I prefer the nomenclature “medallion” adopted by other lychnologists to distinguish this artifact group from the actual part of the picture lamp called the discus.<sup>40</sup> Lamp medallions can be categorized into three types: (1) relatively round with jagged edges, resembling a conventional medallion, (2) an angular “chip” version, and (3) circular with rounded edges, suggesting separate manufacture using the concave part of the upper lamp mold.<sup>41</sup> The medallion extracted from the Tarsus-made picture lamp is a good example of Type 1, with round and jagged edges (see Fig. 1), as is an example depicting the winged horse, Pegasus, recovered from Area CC above the palace at Herod's harbor at Caesarea Maritima, Israel.<sup>42</sup> At Montans (Tarn), chip-type lamp medallions (Type 2) were discovered.<sup>43</sup> Lamp medallions serve as important clay documents of the various iconographic themes they portray and provide insight into which of those themes were most valued by lamp users. Popular motifs on picture lamps include deities, cupids, myths, daily and ritual objects, erotic scenes, gladiators, entertainment, animals, and a rosette and wreath.<sup>44</sup>

Although lamp medallions are relatively common across the empire, the largest quantities by far have been uncovered in the Gallo-Roman Vocontian sanctuaries of Chastelard

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Loeschcke Type VIII (Tarsus Group XVIA) and date to the 2nd c. CE. They were reportedly recovered from Tomb 3 at Sinda (?) and are currently found in the Louvre (inventory number AM 1644).

<sup>33</sup> Heimerl 2001, pl. 11: 464–66, Group 9g–9h.

<sup>34</sup> Bailey 1988, Q 3080 and Q 3081, 370, 379, pl. 103.

<sup>35</sup> Rouzeau et al. 2016, 154, no. 7, and no. 6, an ovoid lamp with a missing discus. Malagoli 2016, 164–65, fig. 1.2.

<sup>36</sup> Bailey 1980, Q 1004, belonging to Broneer Type XXI and dating to around 1–50 CE, and Q 1243 dating to about 90–110 CE.

<sup>37</sup> Frecer 2015, 73, λ 1.

<sup>38</sup> Žuravlev 2007, 223–24, fig. 17:4, 9, and 10.

<sup>39</sup> For example, see Bussière 2007, 58; Eckardt 2002, 371, Appendix 4.

<sup>40</sup> Chrzanovski 2019, 285 (“médaillons”); Bergès 1989, 15, fig. 2(d), 26 (“disques”).

<sup>41</sup> Bailey 1988, 36, Q 2482.

<sup>42</sup> Sussman 2008, 225, 267, no. 44.

<sup>43</sup> Bergès 1989, 74, fig. 48, nos. 660–65, 667, 669–71, 673, Deneauve Type VIID.

<sup>44</sup> Eckardt 2002, 127–29, table 11.



Fig. 3. Lamp medallion with Gaulish-style Dionysus originating from a picture lamp. Chastelard de Lardiers, Drôme. (© Nicolas Rouzeau/Projet Collectif de recherches/DRAC-SRA-PACA.)

de Lardiers and Lachau in southern France.<sup>45</sup> A medallion depicting a Gaulish-style Dionysus, for example, was unearthed in the sanctuary at Chastelard de Lardiers (Fig. 3).<sup>46</sup> The rubbish deposit covering the Arles-Rhône 3 underwater barge also yielded decorated lamp medallions, which, as in the Vocontian sanctuaries, were deliberately extracted and, as the fine cuts indicate, carefully worked to preserve the central motifs.<sup>47</sup> Much of the rubbish covering the barge can certainly be accounted for by sailors dumping garbage into the river from the boats moored on the right bank of the Rhône. Laurent Chrzanovski has, however, been able to identify intentionally cut discs among the rubbish, which, together with over 100 perfectly intact objects, are suggestive of a deliberate cult offering associated with rivers and navigation.<sup>48</sup> That over 80% of the motifs decorating the medallions left by the worshippers at the Vocontian sanctuaries and covering the Arles barge belong to the same iconographic repertoire may represent evidence for a Gallo-Roman ritual specific to the region.<sup>49</sup> The recur-

rence of lamp motifs associated with wine, theater (masks), and gladiators at these sites might suggest a regionally shared ritualistic meaning and purpose.<sup>50</sup>

Pergamon has yielded additional lamp medallions depicting Medusa, erotic scenes, and animals, as well as angular, chip-type examples.<sup>51</sup> Medallions from Italy depict a variety of pagan deities (e.g., Fortuna, Jupiter, Mercury, Silenus, and Apollo).<sup>52</sup> A specimen with a grasshopper has been recovered from Antipatris in Roman Palestine, and a chip-type medallion showing a bovine was excavated at Sepphoris.<sup>53</sup> Medallions picturing the Three Graces, and others with three actors on a stage, have been excavated in Egypt.<sup>54</sup> Though less common, mold-pressed, circular, clay lamp lids can be confused for lamp medallions.<sup>55</sup>

### Discus motifs: meaning and context

Whether picture lamp motifs carry any meaning connected with their archaeological context has puzzled lychnologists for some time now. This is a vast topic, worthy of an

<sup>45</sup> Girard et al. 2016, 66–70, fig. 16, nos. 13–15, 19–22; Rouzeau et al. 2016, 153, fig. 4; 153–56, fig. 6:15–19, 21–22, and 25–27; Malagoli 2016, 164–65, nos. 6.1–3, 5.

<sup>46</sup> Rouzeau 2016, 198, fig. 7. I thank L. Chrzanovski for this motif identification.

<sup>47</sup> Chrzanovski 2020, 222.

<sup>48</sup> Chrzanovski and Djaoui 2018, 63–68, fig. 4a and b.

<sup>49</sup> Chrzanovski 2020, 212–14, 222, figs. 14 and 15.

<sup>50</sup> Chrzanovski and Djaoui 2018, 66–68, fig. 4.

<sup>51</sup> Heimerl 2001, pl. 18, nos. 773, 798–802, 811–13; pl. 19, no. 864–65, 876 (round with jagged edges). Heimerl 2001, pl. 18, nos. 774–76, 779–97; pl. 19: 832–63, 866–74 (angular chip-type).

<sup>52</sup> Bailey 1980, Q 1056, Q 1064, Q 1057, Q 1071, Q 1060, Q 1065, and Q 1480.

<sup>53</sup> Neidinger 1982, 161, no. 13, pl. 22:2; Lapp 2016, 251, no. 89.

<sup>54</sup> Bailey 1996, Q 1918 bis, pl. 170, Broneer Type XXI; pl. 172, Q 2046 bis.

<sup>55</sup> Bailey 1996, Q 1470 (Jupiter-Ammon) and Q 1471 (possibly Socrates).

in-depth treatment of discus themes from multiple sites in various regions that is beyond the scope of this essay. That said, some discussion is required here, as the discus scenes of Roman picture lamps may hold the key to why they were intentionally broken. The question is whether any motifs held a symbolic or apotropaic meaning that would help explain why this lamp group was commonly chosen for breakage and other rituals. We can surmise that, for example, a discus lamp picturing a specific god may possess and project the qualities attributed to that deity. A depiction of Apollo, for instance, might convey his association with power, music, shepherding, and animals. Do such discus images, then, occur on picture lamps recovered from shrines dedicated to this god, and consistently so?

Hella Eckardt has conducted an extensive analysis of the discus motifs on picture lamps excavated in Roman Britain and their association, if any, with their respective archaeological findspots. She concluded that only the discus images of an altar between two laurel trees, an eagle, and the goddess Victory were likely to have been related to the imagery of Augustan peace and victory.<sup>56</sup> In Roman Palestine, Renate Rosenthal-Heginbottom suggests that four discus lamp images have strong Egyptian associations: the griffin with a wheel, the heron and crab, dwarfs, and *cinaidoi*.<sup>57</sup> They are portrayed on locally manufactured Palestinian picture lamps excavated at the northern coastal city of Dora. Rosenthal-Heginbottom observes that individual lamp discuses with griffins might have been presented to competitors to help ensure victory in the *agones* (contests) that took place in the amphitheater, stadium, and hippodrome. She suggests that the griffin with wheel image relates to the cult of Nemesis and her patronage of athletic events. She points out that the heron found on the lamps represents the Egyptian *benu* bird, which symbolized the God Ra, the sun-god of Heliopolis, and Osiris, the god related to death, resurrection, eternal life, and fertility. Rosenthal-Heginbottom further notes that dwarfs are associated with Egyptian Nilotic inundation rituals that celebrated the Nile flood and the renewed fertility it delivered annually to Egypt, and that the *cinaidoi* had a related meaning. She concludes, however, that the images found on the Dora lamps cannot be linked to specific domestic cults and rituals, nor do their respective findspots shed any light on their original contexts.

In Roman Palestine, I would expect lamps bearing the heron-and-crab imagery – symbolizing Osiris and eternal life – and in Roman Britain, lamps portraying the Egyptian god Arubis, also signifying everlasting life, to be found in burial contexts. Such consistent discus imagery, associated with a specific type of context, would indicate cultic behavior suggestive of collective choice among members of the funeral party.<sup>58</sup> But this is not the case. A variety of random and unassociated lamp imagery prevails, suggesting individual choices made by participants of cults or members of funeral parties. Individual choice may also be evidenced by a picture lamp dropped into an infant's grave at Gerulata. Out of the nine picture lamps with mythological scenes recovered from the cemeteries there, only one has a relationship with its funerary findspot: a discus scene with the mask of Hercules on an altar, which can be associated with death and mortality.<sup>59</sup> Frecer cautions

<sup>56</sup> Eckardt 2002, 117–18, fig. 54; 124–25, fig. 56.

<sup>57</sup> Rosenthal-Heginbottom 2017, 154–58, figs. 10.6A and B, 10.7, and 10.8A and B, table 10.2.

<sup>58</sup> Cf. Eckardt 2002, 122.

<sup>59</sup> Frecer 2015, 85, λ14, 388, 395, fig. 7.12, far right, an infant inhumation burial.



that the other discus-motifs are “not overtly connected to death” and therefore support the prevailing hypothesis that “lamp discus-motifs had little to do with their function as grave-goods or votive offerings.”<sup>60</sup> However, a picture lamp (Broneer Type XXII/Loeschcke I) recovered from a foundation offering (around 25–60 CE) beneath a wine storehouse at the Roman port of Lattara (Lattes, France) depicts a discus theme related to viticulture – a winged cupid picking and carrying grapes in buckets – reflecting the function of its context, the storage of wine.<sup>61</sup>

In short, the meaning of motifs and symbols on lamps recovered from sacred spaces generally does not suggest any association between the lamp image and the function of the context.<sup>62</sup> In her exhaustive study on lighting in Roman Britain, Eckardt concludes that although variation existed, as evidenced in the archaeological record, there is “little proof for a systematic relationship between the images on a lamp and the context in which it was used.”<sup>63</sup> In Roman Palestine, too, the motifs on lamps generally do not show a consistent connection to the context in which they were found.<sup>64</sup> For example, the motifs appearing on the 31 lamps surrounding the altar of the Mithraeum at Caesarea Maritima do not indicate any relationship to the Mithras cult.<sup>65</sup> Two lamp fragments might depict Helios,<sup>66</sup> but not as conclusively as the example wearing the characteristic radiate crown from the Mithraeum of Santa Maria Capua Vetere in Campania.<sup>67</sup> The variety of images at the Caesarea Maritima Mithraeum suggests *personal* choices made by individual Mithraists there, not a collective decision. What is consistent, however, and therefore suggestive of collective behavior and thought, is the offering and use of lamplight – whether actual flame-light (lamps showing traces of burning) or symbolic light (unused lamps) – in association with the altar.

Several notable observations have been made regarding discus scenes occurring at sites in Roman Gaul. The Roman barge submerged in the Rhône River (AR3 site), for example, yielded lamp medallions with motifs that are consistently associated with entertainment: theatrical and Dionysian masks, gladiatorial equipment, and laurel wreaths.<sup>68</sup> There is, however, no obvious connection between these images and the ritual tossing of the medallions into the Rhône. At d’Allan (Drôme), deities (26.7%) and animals (26.7%) are the most common motifs on the picture lamps recovered from the sanctuary.<sup>69</sup> Additionally, Nuria Rovira and Lucie Chabal argue that the foundation offering (FS26221) of ceramic drinking vessels and the lamp picturing the cupid and grapes found beneath the wine storehouse at Lattara do reflect the function of their context – the storage of wine – and the significance of the beverage in ritual practices (libations).<sup>70</sup>

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<sup>60</sup> Frecer 2015, 395.

<sup>61</sup> Rovira and Chabal 2008, 198–99, fig. 5.

<sup>62</sup> Lapp 1997, 222–23 (Roman Palestine); Eckardt 2002, 133, 154 (Roman Britain).

<sup>63</sup> Eckardt 2002, 133, 154.

<sup>64</sup> On lamp iconography and various findspots in Roman Palestine, see Lapp 1997, 84–99, figs. 67–78; 190–223, figs. 129–59.

<sup>65</sup> Hartelius 1987, 91–99; Lapp 1997, 194–96, nn. 11 and 17.

<sup>66</sup> Hartelius 1987, nos. 71 and 89; Lapp 1997, 194–96, n. 15.

<sup>67</sup> Vermaseren 1971, 109, no. 108e.

<sup>68</sup> Chrzanovski and Djaoui 2018, 67–68, fig. 4a and b; Chrzanovski 2020, 222.

<sup>69</sup> Bois et. al. 2016, 110–13, table 3.

<sup>70</sup> Rovira and Chabal 2008, 192–93, figs. 2 and 3; 199, fig. 5. A second picture lamp found in the pit was decorated with a laurel wreath, symbolizing glory (Rovira and Chabal 2008, 199).

### Why were picture lamps intentionally broken?

Not unexpectedly, ancient literary, epigraphic, and papyrological sources are relatively silent as to the similar or different reasons why pagans and monotheists intentionally broke picture lamps.<sup>71</sup> Should we expect such specificity, though? As Fritz Graf observes, “ancient sources tend to record only the exceptional and aberrant rituals, not the familiar and ordinary ones of daily life.”<sup>72</sup> This general lack of textual data contributes to the difficulty of defining and interpreting rituals.<sup>73</sup> In a rare account, the 5th-c. monk Sozoman describes residual pagan rituals performed at the sanctuary of Mamre/Terebinthus (Israel), where contemporary worshippers placed burning lamps near the sacred well into which they also poured wine and dropped cakes, coins, myrrh, or incense. He writes nothing about breaking lamps. Also not mentioned in his account, however, are the many lamps that were intentionally dropped into the well, as substantiated by the archaeological evidence.<sup>74</sup> Additionally, Lee Levine points out the shortfalls of interpreting archaeological material culture using ancient texts.<sup>75</sup> Given the “silence” of the textual sources, we must depend largely upon the archaeological evidence and contexts where picture lamps with missing discuses and medallions occur to determine the meaning and purpose behind deliberate lamp breaking. So far, protection, iconoclasm, purity, and functionality have been posited as reasons explaining mutilation practices.

#### *Protection*

The abundant lamp medallions recovered from the sanctuaries of Chastelard de Lardières and Lachau,<sup>76</sup> as well as those found at other cultic sites, indicate that picture lamps were intentionally broken to extract the discus scenes, potentially for use as offerings. But might ancient worshippers have believed that the image-bearing lamp medallions were imbued with amuletic powers? A blue faience medallion portraying Medusa, found among other amulets in a wooden box recovered at Pompeii, may provide a clue: images of Medusa, as well as other mythological characters, were perhaps removed from picture lamps for amuletic protection.<sup>77</sup> Medusa images were popular on small objects such as cameos, finger-rings, and gems. It is not surprising, then, that this mythological monster also bedecked lamp medallions. Several, for instance, have been recovered at Sepphoris, Beth Shean, Caesarea Maritima, and Antipatris in Roman Palestine;<sup>78</sup> others originate from picture lamps manufactured at Pergamon.<sup>79</sup>

<sup>71</sup> On the dearth of literary testimonies explaining ancient rituals and offerings (like lamps), described as “linguistically impoverished,” see Smith 1987, 102.

<sup>72</sup> Graf 2003, 1318.

<sup>73</sup> Graf 2003, 1318.

<sup>74</sup> Tal and Taxel 2017, 181, n. 9.

<sup>75</sup> Levine 2000, 567–69.

<sup>76</sup> Chrzanowski 2020, 212–14, figs. 14 and 15.

<sup>77</sup> Montoya 2020, 56–57. Oil derived from the plant taxa *Linum usitatissimum* and *Olea europaea* provided protection against evil (Rovira and Chabal 2008, 196–97, table 2) and if used as lamp fuel, may have enhanced the amuletic power of picture lamps, among others, in offertory contexts.

<sup>78</sup> Lapp 2016, 59, 252, nos. 105–9, fig. 5 (Sepphoris); Hadad 2002, 16, 20, no. 24 (Beth Shean/Scythopolis); Sussman 2008, nos. 44–45 (Caesarea Maritima); Neidinger 1982, 165–66, no. 35, pl. 23:9 (Antipatris).

<sup>79</sup> Heimerl 2001, pl. 18, nos. 799–813.

Lamp medallions are noticeably absent from findspots where numerous picture lamps with missing discuses occur (e.g., Apollonia and Teo'mim Cave), including Jewish tombs (e.g., Qir'at Tivon); here, lamps may have been intentionally broken during graveside rituals and the resulting medallions kept as souvenirs of the dead, or perhaps even for use as photoamulets to protect against darkness where impure evil spirits lurk.<sup>80</sup> Ancient Jewish magical texts and amulets,<sup>81</sup> and Jewish sacred art incorporating pagan imagery (see discussion below) lend support to this possibility that Jews used medallions with pagan motifs for amuletic purposes as well. Conceivably, lamp medallions were worn as pendant-photoamulets, as many examples preserve their filling-holes, through which a cord would have been easily inserted.<sup>82</sup> Miniature glass lamp-pendants from Italy and Egypt, for instance, probably served a similar amuletic purpose.<sup>83</sup>

### *Iconoclasm*

Jewish religious law hints at possible reasons why picture lamps were purposely broken by Jews and Samaritans in Roman Palestine but might not reflect practices in the Diaspora: it is surely not applicable to non-Jewish, pagan motivations behind deliberate discus breaking. One explanation suggests that Jews and Samaritans mutilated pagan discus-scenes in observance of the Second Commandment prohibition against graven images.<sup>84</sup> Oren Tal and Marcio Bastos observe that lamp breaking “was not merely a religious act shared by the three monotheistic religions [Judaism, Samaritanism, and Christianity] of Roman Palestine...but also an act used to assist in the desired victory of the Lord over His pagan counterparts.”<sup>85</sup> This is certainly plausible. Jewish textual sources reveal, however, that rabbinic attitudes toward pagan figurative imagery – whether strict or lenient – “varied considerably,”<sup>86</sup> an observation that is further substantiated by the archaeological record. For example, Jewish congregations accepted and incorporated pagan imagery into their religious art, as demonstrated by portrayals of the sun god Helios centered inside zodiac wheels on the synagogue mosaics at Beth Alpha, Hammath Tiberias, Na'aran, and Sepphoris.<sup>87</sup> Helios is, further, pictured on discus lamps recovered from the Nabratein synagogue and a Jewish tomb at Ti'von.<sup>88</sup> That the Jewish patriarch of Sepphoris may have owned the city's luxurious villa,<sup>89</sup> which contains a mosaic depicting the gods

<sup>80</sup> On the definition and various types of photoamulets, see Lapp 2021, 415–36; for medallions extracted from magic clay bowls, see Žurawski 1992, 96–97, figs. 8 and 9.

<sup>81</sup> Magness 2005, 41–42. Berger 2005, 80–81, fig. 25, Jewish amulet from child's grave located at Dombóvár, Hungary. On Samaritan amulet usage, see Pummer 2020, 83, 84–87, nn. 11–13, 19–22.

<sup>82</sup> Chrzanovski 2020, 212–14, fig. 14, lower left, three medallions with laurels (Arles-Rhône 3 shipwreck site).

<sup>83</sup> Lapp 2021, 423–24, fig. 20.3.

<sup>84</sup> Exod 20:4–5; m. *Avodah Zarah* 3:3; m. *Betzah* 4:4; and m. *Kelim* 2:8, 3:2. See Brand 1953, 350–53. Sivan 1982, 115–16; Rosenthal-Heginbottom 1981, 127–28; Tal and Bastos 2012, 104–8, 112, fig. 1.

<sup>85</sup> Tal and Bastos 2015, 347. Tal and Bastos include early Christians among those practicing possible lamp mutilation.

<sup>86</sup> Levine 2000, 451, 454.

<sup>87</sup> See Erickson 2020, 100–19 (Beth Alpha), 136–58 (Hammath Tiberias), 88–99 (Na'aran), 159–75 (Sepphoris).

<sup>88</sup> Lapp 2009, 254–56, photo 48, left, pl. B no. 13; Vitto 2011, 48, fig. 26:1.

<sup>89</sup> Talgam and Weiss 2004, 127–31; Bowersock 2006, 39, n. 17.

Heracles and Dionysus, and that the city's domestic area yielded Palestinian picture lamps decorated with standard Roman motifs (e.g., charioteer, Europa with the bull, Bacchus with chalice, erotic scenes, etc.), suggests that Jewish Sepphoreans were also not offended by pagan imagery. And, as Glen Bowersock elegantly observes, the mythological Amazons represented in the Nile Festival Building mosaic at Sepphoris are "another arresting illustration of a universalizing pagan mythology that so thoroughly Jewish a city absorbed with ease."<sup>90</sup> Additionally, many picture lamps were plain, so breaking their discuses should not be explained by aniconic behavior.<sup>91</sup>

### *Purity*

Picture lamps recovered from Jewish burial contexts in Roman Palestine may reflect breakage rituals meant to satisfy the Mishnaic requirement that a lamp's filling-hole must be as large as a coin (*perutah*) for the oil to pass through to avoid impurity and "uncleanness."<sup>92</sup> In Upper Galilee, for example, picture lamps exhibiting broken discuses have been recovered from Tomb T-29 associated with the ancient synagogue at Khirbet Shema' and may represent evidence for this belief.<sup>93</sup> Additional picture lamps with missing discuses were recovered from the Akeldama tombs located in the Kidron Valley south of the Old City, Jerusalem. Of the nine discus lamps recovered from the tombs, six exhibited broken, missing discuses.<sup>94</sup> These loculus tombs were initially Second Temple-period Jewish burials, until around 70 c. CE. The lamps with missing discuses were recovered from Cave 1, Chamber A, and may indicate some sort of graveside, lamp-breakage purity ritual in the late 1st–3rd c. CE, when the Akeldama caves were used for Late Roman cremation burials during Phase B.<sup>95</sup> Picture lamps were not the only types to have been deliberately broken. In Catacomb 12 of the Jewish necropolis at Beth She'arim in Galilee, several Northern Stamped-type lamps dating to the 3rd c. CE also exhibit intentionally broken discuses.<sup>96</sup> Later Samaritan lamps with closed tops, too, were considered ritually pure and were "opened" only before use.<sup>97</sup>

### *Functionality*

Practical reasons may also account for deliberate picture-lamp breakage.<sup>98</sup> The small filling-hole of picture lamps may have made the introduction of oil difficult, and the central

<sup>90</sup> Bowersock 2006, 61. In some instances, Jews and pagans even visited the same sacred sites, such as Mamre. See Drbal 2017, 251.

<sup>91</sup> Sussman 2008, 230.

<sup>92</sup> m. *Kelim* 3:13–14. For additional Mishnaic passages with a discussion on intentional lamp breakage and laws pertaining to ritual purity, see Vitto 2011, 52\*.

<sup>93</sup> Meyers et al. 1976, 131–44, pl. 8.9, nos. 1–2, 6, 8.

<sup>94</sup> Avni and Greenhut 1996, 85–87, figs. 4.9:4, 4.10:2–6.

<sup>95</sup> Avni and Greenhut 1996, 5–7, 35.

<sup>96</sup> Avigad 1976, 184–90, pl. LXX, nos. 9–11, 13–14, 18–20, 23–25.

<sup>97</sup> Sussman 1983, 71–96, pl. 2, nos. 1–10; pl. 3, nos. 1–18. Sussman 2008, 230. For examples of "closed" and "open" Samaritan lamps recovered from the dumps at Apollonia, see Tal and Taxel 2017, 188–89, fig. 12.4:5, 14, 17 (closed); fig. 12.4:1–4, 6–13, 15–16, 18–19 (open).

<sup>98</sup> Physical factors and post-depositional processes also contribute to lamp breakage, including fabric friability, spalling, salt erosion, mechanical weathering, geochemical soil leaching, and earthquake damage (Lapp 2022, 143–44).

discus may have been intentionally broken to widen the aperture.<sup>99</sup> When I poured olive oil into the fuel chamber of Lamp E of this study, however, I encountered no such complications: the concave discus functioned quite effectively as a funnel and channeled the oil into the fuel chamber. In the case of overfilling, the concave discus prevented the loss of excess oil by allowing it to pool around the filling-hole. These observations indicate that picture lamp discuses did not need to be broken to facilitate filling. Other lamp types, however, did. A shortage of olive oil in the northern provinces, resulting from trade competition between Roman Italy and Hispania Baetica during the 2nd c. CE, for example, necessitated cutting out the discus part of “factory” lamps, or *Firmalampen*, and manufacturing new versions with large filling-holes, as reflected in the lychological finds from the Roman cemeteries at Heidelberg.<sup>100</sup> This enabled lamps to be filled with the alternative, but thicker, talc-fuel.<sup>101</sup> Chemical analysis of picture and factory lamps from Cologne and Kaiseraugst similarly indicates that locally available oils were substituted for costly olive oil as alternative liquid fuels.<sup>102</sup> This “energy crisis”<sup>103</sup> may have extended to Pannonia as well, where, at Gerulata, several factory lamps exhibit comparable missing discuses.<sup>104</sup>

The archaeological and limited textual evidence suggests that the reasons behind intentional lamp breakage depend on the primary use-context and the religious group – pagan or monotheistic – doing the breaking. That picture lamps with missing discuses predominantly occur in sanctuary and burial contexts suggests that lamp mutilation was a ritualistic practice in sacred spaces. Those extracting the medallions likely kept them for their imagery, which held some sort of meaning and perhaps even served an amuletic purpose. The medallions may have functioned as souvenirs, a reminder of participation in a breakage ritual at a burial or at a sanctuary, as they are generally absent from these contexts. Among Jews and Samaritans in Roman Palestine, the breakage of a lamp’s discus may have been performed for purposes of purity and iconoclasm, though the latter is less probable. As utilitarian vessels, lamps needed to carry out their function of providing artificial light, too, so the breakage of the discus may have been required in certain circumstances simply to facilitate the introduction of fuel, especially the thicker talc-fuel used in Germania. Although intentional lamp breaking was performed by pagans and non-pagans throughout the Roman world, the meanings behind the practice were probably specific to local and perhaps regional sanctuaries, or different burial customs among diverse religious groups.

### The Shrine of Apollo (Tyre, Lebanon): picture lamp rituals

The Shrine of Apollo in Tyre provides a unique opportunity to examine several different cultic practices involving lamps, including intentional breakage. Eighty-eight clay lamps were recovered from the complex, 81 of which were related to the “Skene” (Fig. 4).<sup>105</sup>

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<sup>99</sup> Sussman 1983, 71–72; Sussman 2008, 230; Lapp 2009, 254.

<sup>100</sup> Hensen 2009, 433–41.

<sup>101</sup> Hensen 2009, 435, fig. 6.

<sup>102</sup> Frecer 2015, 383, nn. 52–53. On oil production in Egypt, see Chrzanovski 2019, 37–38.

<sup>103</sup> Hensen 2009, 433.

<sup>104</sup> Frecer 2015, nos. λ73–74, 80, 85, 97, 105, 113, 116.

<sup>105</sup> Bikai et al. 1996, 30. The term “Skene” is coined here by the excavator to describe Area 1 of the Shrine of Apollo and presumably resembles the stage building of a theater. Bikai et al. 1996, 1.



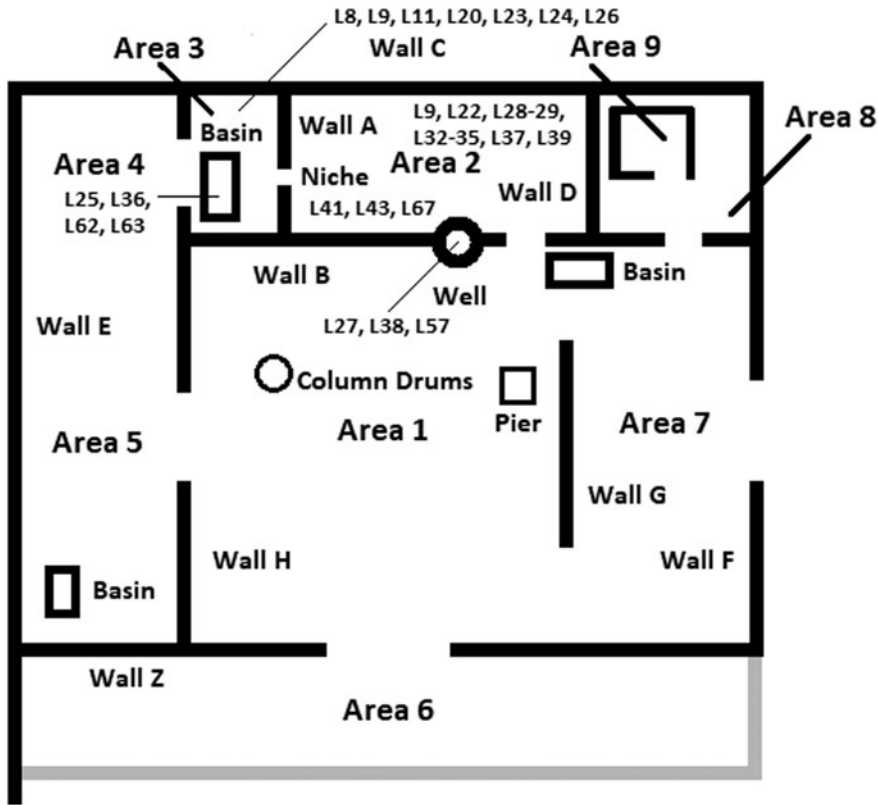


Fig. 4. Plan of the Skene of the Shrine of Apollo, Tyre, Lebanon (Phase 2), showing findspots of lamp finds. (After Bikai et al. 1996, 7, fig. 28; redrawn by E. Lapp.)

Most of the lamps date to the 1st and 2nd c. CE. Sixty-three of the 88 (72%) are picture lamps belonging to Broneer XXI, XXII, XXIII, and XXV,<sup>106</sup> suggesting that this was the preferred lamp type for cultic use in the sanctuary. Broneer Type XXIII picture lamps are the most common group. The replica lamps selected for the breakage experiments of this study (see below) also belong to this type. The clay lamps excavated from the western end of Area 2 of the Skene likely served as cult offerings.<sup>107</sup> The Shrine of Apollo reveals several important elements of cultic lamp usage: 1) a rare systematic relationship between the lamp discus-images and their archaeological use-context; 2) picture lamps with intentionally broken and missing discuses indicating individual-choice, lamp-breakage rituals; 3) lamp sherds *possibly* resulting from drop and/or impact breakage rituals; and 4) separate offertory lamp rituals in which lamps were tossed into water basins and a well, and were also buried beneath platforms and stones.

#### *Picture lamps with discus scenes linked to Apollo*

The picture lamps recovered from the shrine – particularly in Areas 2 and 3 – reveal a thematic link between discus image and use-context, specifically an association with the

<sup>106</sup> Bikai et al. 1996, 58–65, nos. 4–58, 60–68.

<sup>107</sup> Bikai et al. 1996, 15.

## Roman picture lamp breakage rituals

deity Apollo (Table 1).<sup>108</sup> Two picture lamps, for example, show grazing sheep or goats that allude to Apollo's role as a pastoral deity and the patron of the shepherds who protected flocks and herds. Certain animals and sea creatures were also dedicated to Apollo, including the dolphin,<sup>109</sup> which decorates the shoulders of two picture lamps found inside the basin in Area 3. A picture lamp with an octopus also occurs at the site, though I am unaware of any connection between the cephalopod and the god, except that it is a marine creature. Other discus images of animals on lamps from the shrine include a leopard, a lion, a boar (or bear), doves, and rabbits (see Table 1). Additionally, Apollo was the god of music, who favored the lyre.<sup>110</sup> A picture lamp showing a standing male figure holding a lyre suggests that whoever offered it likely selected the lamp with Apollo's connection to this instrument in mind. Although this discus scene could be interpreted as Apollo with a lyre, it is worth noting that the image is dissimilar to the representations of the god on other lamps, such as two examples excavated at Salamis or Kourion, Cyprus.<sup>111</sup> Eros playing the double-flute, as well as the harp occurring on other lamps recovered from the sanctuary, further relate to Apollo's role as the god of music. Granted, Eros is commonly connected to Aphrodite, but other gods often received offerings from dedicants in sanctuaries. A hoplomachus brandishing his weapon and shield appears on a picture lamp found in Area 2, where there was also another lamp showing a possible wounded Amazon. Both scenes are suggestive of Apollo's relationship to warrior-craft and his affection for the bow as a weapon. Apollo's father, Zeus, is symbolized by an eagle, with wings spread and clutching a branch in its beak, on a lamp discovered under a stone in Area 2, while a lamp from Area 3 depicts him as a swan seducing Leda.

Ultimately, one must reflect on what a lamp discus motif meant to a worshipper at Tyre's Shrine of Apollo: did he or she identify the motif with Roman mythology, or with pre-existing Phoenician mythology, or both?<sup>112</sup> In Roman Palestine, for example, the pagan sun god Helios held different meanings for different religionists: Jews may have identified Helios with Metatron (the divine super-angel), while Christians and pagans saw the god, in the guise of Sol Invictus, as Christ or the later Roman emperors, respectively.<sup>113</sup>

### *Picture lamp breakage rituals*

Three published picture lamps found in the Shrine of Apollo exhibit missing discuses that were intentionally extracted in breakage rituals: two belong to Broneer Type XXIII and the third to the Palestinian picture lamp group recovered from Area 2.<sup>114</sup> The broken discus of the Palestinian picture lamp closely parallels those of the intentionally broken lamps excavated from numerous sites in Israel (see above). That few other picture lamps recovered from the Apollo complex exhibit intentionally broken discuses suggests a ritual

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<sup>108</sup> See Table 2 for the discus scenes and their respective lamp catalogue numbers and findspots.

<sup>109</sup> Grimal 1951, 43.

<sup>110</sup> Grimal 1951, 42.

<sup>111</sup> For examples, see Bailey 1988, 5–6, 294, 302, Q 2376–77, pl. 63, fig. 6.

<sup>112</sup> For this perspective on discus-image meaning, see Frecer 2015, 309, 395.

<sup>113</sup> Magness 2005, 38, 41.

<sup>114</sup> Bikai et al. 1996, 60, L20; 64, L55 (Broneer Type XXIII); 65, L67 (Palestinian picture type, Broneer Type XXV).

Table 1.

Roman picture lamp findspots and various lychnological data. Shrine of Apollo. Tyre, Lebanon.

<i>Findspot by area</i>	<i>Lamp series/no.</i>	<i>Type</i>	<i>Discus image</i>	<i>Shoulder image</i>	<i>Broken discus</i>	<i>Completeness</i>	<i>Date</i>
<b>Areas 1/2</b>							
Inside well	L5	Broneer XXI	n/a	n/a	n/a	handle fragment	late 1st c. BCE
Inside well	L7	Broneer XXI	concentric rings	plain	no	mostly complete	late 1st c. BCE
Inside well	L18	Broneer XXII	n/a	n/a	n/a	nozzle fragment	1st c. CE
Inside well	L27	Broneer XXIII	dove	plain	no	fragments	1st–2nd c. CE
Inside well	L38	Broneer XXIII	boar or bear	plain	no	mostly complete	1st–2nd c. CE
Inside well	L45	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L46	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L47	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L48	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L49	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L53	Broneer XXIII	ud	ud	ud	ud	1st–2nd c. CE
Inside well	L57	Broneer XXIII	octopus	plain	no	incomplete	1st–2nd c. CE
Inside well	L58	Broneer XXIII	n/a	n/a	n/a	fragment	1st–2nd c. CE
Inside well	L60	Palestinian Picture	ud	ovule pattern	ud	ud	2nd–3rd c. CE
<b>Area 2</b>							
Along Wall C	L9	Broneer XXII	biga charioteer whipping horses	plain	no	complete	1st c. CE
Near stone 4314	L22	Broneer XXIII	hoplomachus w/ weapon & shield	ud	no	complete	1st–2nd c. CE
Near stone 4314	L28	Broneer XXIII	jumping rabbit	plain	no	nearly complete	1st–2nd c. CE
Near stone 4314	L29	Broneer XXIII	jumping rabbit	plain	no	complete	1st–2nd c. CE
Near stone 4314	L32	Broneer XXIII	putto riding dolphin	plain	no	complete	1st–2nd c. CE
Near stone 4314	L33	Broneer XXIII	seated putto with harp	plain	no	complete	1st–2nd c. CE
Near stone 4314	L34	Broneer XXIII	seated putto with harp	plain	no	complete	1st–2nd c. CE
Under stone 4314	L35	Broneer XXIII	eagle with wings clutching a branch	plain	no	mostly complete	1st–2nd c. CE
S of break in Wall A	L37	Broneer XXIII	tulip	plain	no	nearly complete	1st–2nd c. CE
Under stone 4314	L39	Broneer XXIII	plain	plain			1st–2nd c. CE
E of point 4314	L41	Broneer XXIII	lion	ud	n/a	fragment	1st–2nd c. CE

Under stone 4314	L43	Broneer XXIII	radiating flower pattern	plain	no	incomplete	1st–2nd c. CE
Hole in floor	L67	Palestinian Picture	plain	two double-axes	yes (intentional)	complete	late 1st–3rd c. CE
<b>Area 3</b>							
Inside basin	L62	Palestinian Picture	concentric rings	2 dolphins & rosette	no	complete	2nd–3rd c. CE
Inside basin	L63	Palestinian Picture	concentric rings	2 dolphins & rosette	no	complete	2nd–3rd c. CE
On basin floor	L36	Broneer XXIII	tulip	ud	n/a	ud	1st–2nd c. CE
Along W side of Wall A	L8	Broneer XXII	dove	plain	no	complete	1st c. CE
Along Wall C	L9	Broneer XXII	male figure holding lyre	plain	yes (non-intentional)	nearly complete	1st c. CE
Under platform	L20	Broneer XXIII	2 sheep or goats grazing	plain	yes (intentional)	nearly complete	1st–2nd c. CE
Along W side of Wall A	L23	Broneer XXIII	Amazon (?) on horseback	plain	no	complete	1st–2nd c. CE
Along W side of Wall A	L24	Broneer XXIII	dove	plain	no	complete	1st–2nd c. CE
Under platform, basin floor	L25	Broneer XXIII	dove	plain	no	complete	1st–2nd c. CE
Along W side of Wall A	L26	Broneer XXIII	dove	plain	no	complete	1st–2nd c. CE
E of point 4313	L11	Broneer XXII	Leda & the Swan	plain	no	complete	1st c. CE
N of 4313	L55	Broneer XXIII	plain (?)	plain	yes (intentional)	complete	1st–2nd c. CE
<b>Area 4</b>							
Under platform	L21	Broneer XXIII	2 sheep or goats grazing (?)	plain	ud	ud	1st c. CE

ud = undetermined; n/a - not applicable

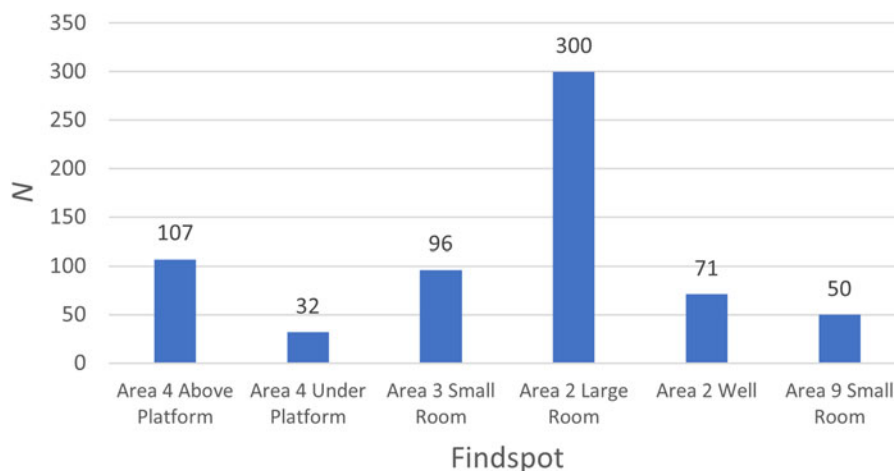


Fig. 5. Lamp sherd quantity (N) by area. Shrine of Apollo. Tyre, Lebanon. (E. Lapp.)

practiced on an individual and personal level rather than one reflecting collective behavior among the cult participants. The Palestinian picture lamps and coarsewares recovered from the shrine further suggest the presence of cult participants from Roman Palestine.<sup>115</sup>

*Lamp sherds possibly resulting from drop and/or impact breakage rituals*

Most intriguing are the 1,071 lamp fragments that were found in association with the shrine: the largest quantity (300) was recovered from the Skene's main room, surrounded by benches, in Area 2 (Figs. 4 and 5; Table 1).<sup>116</sup> The abundance of lamp fragments found in the sanctuary *may* represent evidence for a lamp breakage ritual that involved dropping or impacting, which in turn would suggest collective cultic behavior. It is difficult to determine, though, whether the sherds resulted from intentional breakage or from natural depositional factors, such as earthquake tumble and mechanical weathering. We are in the earliest stages of lamp breakage analysis and must exercise caution when interpreting this type of evidence.

A large number of lamp fragments were recovered from and around the basin in the small room (Area 3), suggesting that lamp offerings were made there. The lamp sherds may have resulted from intact votive lamps being dropped through the niche-opening in Wall A, causing them to break upon hitting the stone pavement. Alternatively, the fragments may have resulted from the intentional breaking of lamps by dropping or impacting them with an implement during a "killing" ritual performed in Area 2, after which they were gathered and deposited into the small room via the niche.<sup>117</sup> That earthquakes

<sup>115</sup> See Bikai et al. 1996, 69–70, nos. 1–13.

<sup>116</sup> Bikai et al. 1996, 18, fig. 77; 29–30, table 8; 57–67, nos. 1–88; 81.

<sup>117</sup> Archaeological evidence for the "ritual killing" of pottery vessels has been recovered from Neolithic deposits in Chamber Z of the Alepotrypa Cave in the Mani, Greece (Psimogiannou 2018, 127–57), Tomb 15 in the Mycenaean cemetery at Mochlos, Crete (Morrison and Park 2008, 207–23), and Tomb X in Offering Pit V at the Late Bronze Age city of Hala Sultan Tekke, Cyprus (Fischer and Bürge 2017, 210). Whether clay lamps or other types of pottery were ritualistically "killed" in Roman times is still to be substantiated.



occurred in the region in 15, 130, and 306 CE may account for some of the lamp breakages. The lamp fragments could also have resulted from other post-use, depositional, mechanical factors, as discussed below in the experimental section of this article.

### *Lamp breakage rituals*

The lamp offerings and large quantity of other objects found in (1) the western end of Area 2; (2) the well between Areas 1 and 2; and (3) the basin in Area 3, suggest this area was the focus of rituals associated with water.<sup>118</sup> Springs, wells, caves, pits, shafts, and other water sources were understood as possible entrances to the underworld.<sup>119</sup> The well located in the Skene was also likely perceived in this way. Additionally, lamp deposits attributed to pagan and pan-religious ritual practices associated with water and the underworld have been identified in Roman Palestine, including, for example, at the sacred well at the sanctuary of Mamre (Terebinthus), the 'Ein Tzur spring, the Ḥammāt Gader baths, the Te'omim Cave, and the sanctuary of Pan at Banias.<sup>120</sup> Lamp medallions were left as votive offerings at the Vocontian sanctuaries of Chastelard and Lachau, which were also associated with springs. That medallions with similar images were recovered from the Roman barge wreck at Arles suggests that they were tossed into the Rhône River in some kind of ritual associated again with water.

Fourteen clay lamps were found in the well located between Areas 1 and 2 (see Fig. 4) and may represent evidence for a lamp ritual whereby the lighting devices were deliberately tossed into the well as offerings of light to placate chthonic gods. Seven of the lamps belong to the Palestinian picture type (Broneer XXV), two to the Broneer XXIII group (like the British Museum replicas in this study), and five to the Northern Stamped group. None of the 14 lamps, though, shows evidence of intentional breakage. The practice of dropping clay lamps into the well, in general, indicates collective behavior. Seventy-one lamp sherds were also recovered from the well. We do not know if these were complete lamps that broke into fragments as a result of a ritual whereby the lamps were dropped or impacted with an implement on the shrine's stone pavement floor and then the fragments gathered and ceremoniously tossed into the well, or if the sherds simply represent depositional debris.

The excavators also report lamps buried beneath the shrine's various platforms, a practice evidenced at other sanctuaries in Lebanon as well.<sup>121</sup> Two grazing sheep or goats decorate the discus of a picture lamp (Broneer XXIII) found under the platform of the small basin room of the Skene in Area 3.<sup>122</sup> A similar picture lamp with possible grazing sheep portrayed on its discus was recovered from under the platform in Area 4.<sup>123</sup> Two Northern Stamped lamps had also been intentionally placed under the sarcophagus platform in Area 4.<sup>124</sup> Evidence for a similar lamp ritual was found at the Decapolis city of

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<sup>118</sup> Bikai et al. 1996, 15, 81.

<sup>119</sup> Zissu et al. 2017, 122, 125.

<sup>120</sup> Tal and Taxel 2017, 181, nn. 4–8; on lamp usage at Banias, see Berlin 1999; cf. Sanctuary of Pan at Vari: Schörner and Goette 2004.

<sup>121</sup> Bikai et al. 1996, 18, fig. 77, lamp nos. 20–21, 71, and 79; and 32 lamp fragments.

<sup>122</sup> Bikai et al. 1996, 60, no. 20, fig. 77.

<sup>123</sup> Bikai et al. 1996, 60, no. 21.

<sup>124</sup> Bikai et al. 1996, 65–66, nos. 71 and 79.

Gerasa (Jordan), where four unused, “new” lamps were buried beneath chamber W24 of the hippodrome as a foundation offering to placate the chthonic gods.<sup>125</sup> Two picture lamps recovered from the storehouse foundation offering at Roman Lattara were presumably deposited as photoamulets by the storehouse keepers in a ritual asking the gods, *Lares* or *Penates*, for protection.<sup>126</sup>

In summary, the lychnological evidence from the Shrine of Apollo reveals several different rituals involving lamps. First, a number of picture lamps portray motifs associated with the cult of Apollo, thereby establishing a rare link between the sanctuary context and lamp-discus imagery. This suggests that worshippers chose their discus imagery carefully when purchasing lamps for use in the sanctuary. The connection between discus-image and context might further reflect cultic beliefs regarding lamp-light usage associated specifically with this shrine on a local level. Second, intentional lamp breakage is evidenced at the shrine by at least three picture lamps with missing discuses found in Area 2. Third, lamps were dropped into the well and one was placed under a platform in offertory rituals. Fourth, a portion of the hundreds of lamp sherds might reflect deliberate ritualistic lamp breaking by dropping or impacting, although natural causes and depositional factors may account for their breakage, too.

### Drop, impact, puncture, and hammerstone experiments

Drop, impact, puncture, and hammerstone experiments were conducted on museum replicas of Broneer Type XXIII, the same picture lamp type that was most commonly found in the Shrine of Apollo at Tyre. As lamp fragments are typically excavated in greater quantities than complete lamps in sanctuary contexts, including Tyre’s, it is important to conduct these experiments to better understand how picture lamps break, as well as to estimate perhaps the quantity and types of sherds that may have been generated in ancient breakage rituals.<sup>127</sup> The hammerstone test was performed with the intention of creating a picture lamp with a missing discus similar to the Palestinian example from Area 2 at Tyre, in addition to extracting a lamp medallion similar to those commonly found in the archaeological record. Sophisticated laboratory instrumentation was purposely not used for the breaking experiments because I wanted to more accurately recreate how in antiquity a clay picture lamp would break by cultic dropping or even by falling off a table in a Roman villa, for example, or being impacted by an actual stone tool and brick during a ritual.

#### *Sample selection*

Five British Museum-produced, clay lamp replicas were selected for analysis (Fig. 6; Table 2). They were slip-cast in a plaster mold made from a plastic resin archetype of an original Roman lamp belonging to Broneer Type XXIII and Loeschcke Type IV.<sup>128</sup> The

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<sup>125</sup> Kehrberg 1989, 86–87, 92, no. 15; Lapp 1997, 200–1, figs. 142–43.

<sup>126</sup> Rovira and Chabal 2008, 199. On photoamulets, see Lapp 2021, 415–38.

<sup>127</sup> Different lamp types break in various ways; the thick clay nozzles of Herodian lamps, for example, are all that survive in some archaeological contexts (Lapp 2022, 143–44).

<sup>128</sup> Bailey 1988, 446–47, lamp Q860; Q3501 is also a reproduction of Q860, pl. 140, and was fired in the modern kiln at 1040°C. In 2005, Catherine Lapp purchased the Lamp A replica in the gift shop of The British Museum, London. On February 22, 2012, I acquired Lamps B–E on The British Museum Company website (order no. 254258/0; product code: R91100).

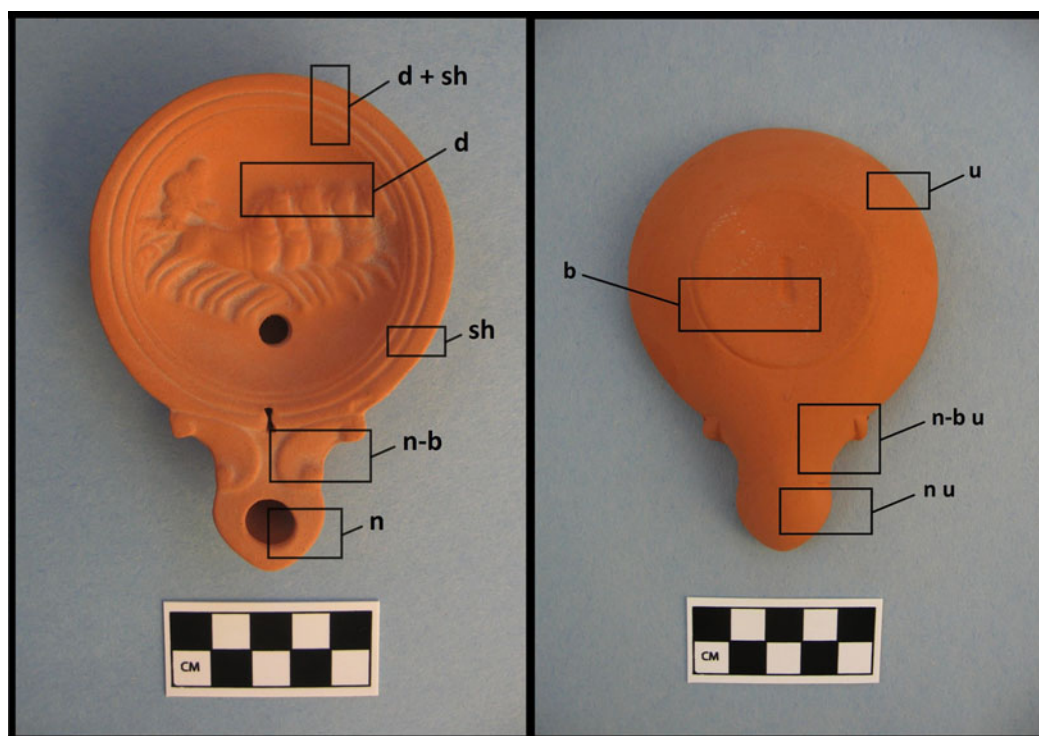


Fig. 6. Replica picture lamp showing upper and lower halves and various body parts: *d* = discus; *sh* = shoulder; *n* = nozzle; *n-b* = nozzle-bridge; *b* = base; *n u* = nozzle underside; *n-b u* = nozzle-bridge underside; and *u* = underside. (E. Lapp.)

archetypal lamp was possibly manufactured between 40 and 70 CE in the Italian workshop of Caius Clodius, as suggested by the CCLOD Latin name positioned inside a *planta pedis* in relief on the base.<sup>129</sup> Unlike the original, the replicas used in the experiments are not slipped, and the same clay was not used for their manufacture. Examples of this lamp type have also been found in Israel and Jordan.<sup>130</sup>

#### Macroscopic analysis

Before conducting the lamp breakage experiment, Lamps A–E were weighed separately using an Adam Equipment Core Series Compact Portable Balance Model CQT 202 with a 200 g capacity and a 0.01 g readability. This was necessary to determine how much weight loss occurred for each lamp after breakage. Following standard lychnological procedure, the macroscopic features of each lamp were then described (e.g., shape type, design, motifs, and fabric characteristics) (Table 2). The lamp fragments resulting from the breakage experiments, including the core bodies, were counted, weighed separately, and photographed. The respective morphological parts of the lamp from which they originated were identified. The complete assemblage of lamps and fragments was weighed to determine how much the lamp's weight was reduced due to breakage. Using estimated mean weight

<sup>129</sup> Bailey 1988, 96.

<sup>130</sup> Sussman 2008, 225, nos. 46–50.

Table 2.  
Macroscopic description of the picture lamp samples.

<i>Sample<sup>a</sup></i>	<i>L<sup>b</sup></i>	<i>W</i>	<i>H</i>	<i>Wf<sup>*</sup></i>	<i>Description</i>
Lamp A	10.9	8.0	2.2	70.72	Complete. Concave discus (diameter, 6.1 cm). On discus: charioteer with horse-drawn chariot in high relief. Plain shoulder. On nozzle-bridge: two volutes; elongated air-hole. Two ridges around discus. Round, slightly pedestaled base (diameter, 4.2 cm). On base: impressed <i>planta pedis</i> . WH = 1.1 cm diameter; FH = 0.7 cm diameter; Thickness: 2.5 mm. Mohs hardness: 7.0. Clinks. Hard fired. No burning. Condition: Excellent.
					<i>Fabric</i> 5YR 6/6 reddish yellow; inclusions: black, well sorted high sphericity (vfs, hf); voids: round, well sorted (vfs, hf).
Lamp B	11.2	8.1	2.5	81.63	Description same as above except for: fabric 2.5YR 5/6 red.
Lamp C	11.0	8.0	2.3	69.57	Description same as above except for: fabric 2.5YR 5/6 red.
Lamp D	10.9	8.1	2.4	72.27	Description same as above except for: fabric 2.5YR 5/6 red.
Lamp E	11.1	8.0	2.4	72.98	Description same as above except for: fabric 2.5YR 5/6 red.

<sup>a</sup>British Museum replica of Broneer Type XXIII. 1st c. CE.

<sup>b</sup>Dimensions (in cm): L, length; W, width; H, height.

\*Wf, total dry weight before breakage (in grams).

analysis, one can estimate the initial number of complete lamps at archaeological sites, such as at Aqaba, Jordan, where few intact lamps but numerous lamp sherds have been found.<sup>131</sup> When applied to large quantities of lamp sherds recovered from sanctuaries, including those from Tyre's Shrine of Apollo, mean weight analysis should provide a more accurate picture as to the number of lamps used in rituals.

#### *Drop test*

A drop test was conducted on Lamps A–C, applying the following methodology for each lamp. First, a complete lamp was placed onto a flat, marble table surface. Next, the lamp was gently slid off the table surface onto a glazed, terracotta tile floor. The hardness of the tile floor is Mohs 3.0. The surface of the table stands at a height of 76.0 cm from the floor. The sherds were placed into a small plastic container marked "Stage 1: Lamp Breakage," and sealed for future reference. In Stage 2, the core body was placed again onto the table surface, then repeating the method above, was gently pushed off the table onto the floor. The findings were recorded again. The resulting sherds were placed into a small plastic container marked "Stage 2: Lamp Breakage."

#### *Impact test*

An impact test was conducted on Lamp D using the following methodology. The lamp was placed onto a terracotta tile floor below the edge of the same tabletop used in the drop

<sup>131</sup> Mean weight analysis conducted on the 75 lamp sherds of the Classic Nabatean type excavated at this Red Sea port suggests 14 estimated original complete lamps (Lapp 2022, 144–45, table 1).

test. Simulating earthquake tumble, a brick was dropped on top of Lamp D from a height of 40.0 cm. The brick weighs 3.20 kg and has a Mohs hardness of 3.0. Its dimensions are length = 23.0 cm; width = 10.5 cm; height = 7.7 cm. It was made by hand following 18th-c. techniques in the brick workshop located at Colonial Williamsburg, Virginia, where it was purchased in the Prentis Store. The resulting sherds were recorded following the same procedure as for the drop test, above. They were placed into a small plastic container marked as “Stage 1: Impact Test.”

### *Puncture test*

A puncture test was conducted on Lamp E. An elongated marble stone with a blunt head was selected for use as a puncture tool. Taking the stone into the right hand and holding the lamp firmly on a stable and horizontal surface with the other, firm pressure was applied against the edge of the filling-hole of the discus – presumably the weakest point of the discus. This procedure was repeated five times.

### *Hammerstone test*

A hammerstone test was conducted on Lamp E. The lamp was held firmly on top of a hard tabletop surface, then its central concave discus was struck in the area of the filling-hole (presumably the weakest point) with two firm blows, using a large, well-rounded, smooth, elliptical-shaped, limestone river pebble (5.0 cm × 3.5 cm). Stone-pebbles were used as tools in the Roman period; for example, a stone-pebble polisher was recovered from the pottery workshop at Sagalassos.<sup>132</sup> For this reason, I selected a stone-pebble for this experiment, as it would have been a common and naturally occurring tool of the type that might have been used to break the central discuses of picture lamps.

## Results of the experiments

On average, Lamps A–C generated seven sherds after the first drop experiment. By contrast, Lamp D yielded as many as 67 sherds after sustaining a single impact. Four types of lamp sherds were generated from the breakage experiments: 1) core (drop and impact); 2) angular “chips” (drop, impact, and hammerstone); 3) cubicles (drop and impact); and 4) flakes (drop and impact) (Fig. 7). The body core is typically the largest fragment, comprising part of the base and lower wall of the lamp and in some instances, also parts of the lighting vessel’s upper half (e.g., shoulder, discus, and nozzle). Angular chips are the most common sherd type resulting from breakage and are characterized by sharp-edged and highly angular fragments. In some cases, enough of the discus motif is preserved on the chip to constitute a chip-type medallion. Cubicles are miniscule, thick, cube-shaped fragments that typically originate from the join between the upper and lower halves of the lamp. Flakes are paper-thin and miniscule fragments indicative of extreme force encountered by the lamp body. Four angular chip sherds resulted from the breaking of the discus of Lamp E.

### *Drop test*

After two drops (Stages 1 and 2), Lamp A broke into 16 fragments (Fig. 8; Table 3). The weight of the lamp decreased from its initial 70.72 g to 70.43 g, a 0.29 g or 0.41% loss of

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<sup>132</sup> Murphy and Poblome 2012, 200–4, table 1, no. 13, fig. 2(a).





Fig. 7. Types of lamp sherds generated from drop and impact experiments. (E. Lapp.)



Fig. 8. Lamp A sherd generation after Stage 1 (left) and Stage 2 (right) drop experiments. The sherds were arranged by the author for clarity. (E. Lapp.)

## Roman picture lamp breakage rituals

Table 3.  
Drop test results, Lamp A sherd creation and weights.

### *Drop Test – Lamp A*

<i>Stage 1</i>				
<i>Sherd no.</i>	<i>Inv. no.</i>	<i>Part*</i>	<i>GD<sup>+</sup></i>	<i>Wf (in grams)</i>
A1 <sup>a</sup>	1	d + n + sh + b	Ud	49.09
A2	2	d + sh + b	7.0	15.79
A3	3	u	3.3	1.68
A4	4	b	2.7	1.57
A5	6	d + sh	3.0	1.12
A6	5	u	2.4	1.08
A7	7	flake <sup>x</sup>	1.6	0.10
TOTAL				70.43
<i>Stage 2</i>				
<i>Sherd no.</i>	<i>Inv. no.</i>	<i>Part*</i>	<i>GD<sup>+</sup></i>	<i>Wf (in grams)</i>
A1.1	8 (7)	b + u	5.9	11.53
A1.2	9 (8)	d + sh	6.2	8.83
A1.3	10 (9)	d + sh + n-b + u	5.6	10.52
A1.4	11 (10)	n + n-b	4.2	4.45
A1.5	12 (11)	sh + u	3.6	3.40
A1.6	13 (12)	d + sh	5.1	3.86
A1.7	14 (13)	d	3.7	2.66
A1.8	15 (14)	n	2.4	2.16
A1.9	16 (15)	u	2.6	0.97
A1.10	17 (16)	u	1.9	0.71
TOTAL				49.09

\*For a definition of abbreviations and location of lamp parts, see Fig. 6: <sup>a</sup> core sherd A1 not included in final total of A2–A1.10; <sup>x</sup> flake included in sherd count as it is large; initial total Wf of complete Lamp A: 70.72; total Wf of resulting fragments after Stages 1 & 2: 70.43; Wf loss of Lamp A after Stage 1 & 2 breakage: 0.29 (or 0.41%); Stage 1, Wf of Lamp A body core after breakage: 49.38; total Wf of resulting fragments after Stage 1: 70.43; Stage 2, Wf of Lamp A body core after breakage: 49.09.

weight. In Stage 1, 21.34 g of sherds were created (excluding the body core). In Stage 1, Lamp A sustained minimal damage to its body. Only six fragments broke away from the core (A2–A7): the largest fragment (approximately 15% preserved) included the upper back and lower shoulder with part of the discus, while the remaining smaller sherds were a discus/shoulder, base, and underside. Approximately 80% of the lamp's core body – all of the nozzle and most of the discus and base – was preserved. The nozzle survived fully intact. Most of the discus and base were also preserved. Upon hitting the floor, the lamp shattered immediately and made a loud and explosive “popping” sound. This sound may be explained as a quick release of air from the vessel's hollow fuel chamber when it hit the floor.

In Stage 2, damage to Lamp A was substantially greater (Fig. 8; Table 3). The body core fractured into ten sherds totaling 49.09 g. Base sherd A1.1 (approximately 30% preserved) was the largest. Although it survived the Stage 1 drop fully intact, the nozzle fragmented into four sherds (A1.3, A1.4, A1.8, and A1.9) during the second-stage drop. It is important to note that no circular lamp medallions resulted from either of the two drops. However, a



Fig. 9. Lamp B sherd generation after Stage 1 (left) and Stage 2 (right) drop experiments. The sherds were arranged by the author for clarity. (E. Lapp.)

single lamp medallion of the “chip” variety (A1.7) was created in Stage 2, as were two additional angular discus fragments (A1.2 and A1.6), exhibiting a pair of lateral and parallel fractures. After both drops, most of the base diameter was preserved and the *planta pedis* survived completely. The three largest sherds included the base and discus fragments.

The drop test conducted on Lamp B resulted in the creation of 21 sherds (B3–B7, B1.1–B1.13, and B2.1–B2.3; Fig. 9; Table 4). Similar to Lamp A, a body core fragment (B1) was generated after the first drop (Stage 1) and minimal damage to the morphology of the lamp occurred. Only six sherds broke away from the lamp’s body in Stage 1 and four flakes were produced. However, as a result of the Stage 2 drop of fragments B1 and B2, 14 new sherds were created and the damage to the lamp’s morphology was severe. A medallion of the angular “chip” variety resulted from the drop test conducted on Lamp B (Fig. 9, B2.3).

Only one drop test was performed on Lamp C, which generated ten sherds (C1–C10; Fig. 10; Table 5). Unlike Lamps A and B, Lamp C sustained slightly greater initial damage to its body in Stage 1. An identifiable core resulted. Cubicle-type sherds were also first encountered in Stage 1 (Fig. 10, C9–10). For all three lamps, the drop tests consistently produced a scattered sherd distribution pattern (Fig. 11).<sup>133</sup>

<sup>133</sup> Flowerpots dropped onto a concrete surface yielded a specific sherd-pattern, namely larger fragments fell at a greater distance from the point of impact than smaller ones (Evans and Barrera Hernandez 2017, 2–8, figs. 6–13).

# Roman picture lamp breakage rituals

Table 4.  
Drop test results, Lamp B sherd creation and weights.

## Drop Test – Lamp B

### Stage 1

<i>Sherd no.</i>	<i>Part<sup>a</sup></i>	<i>GD<sup>b</sup></i>	<i>Wf (in grams)</i>
B1 <sup>c</sup>	d + sh + b	8 × 4.3	38.28
B2 <sup>c</sup>	d + n	7.9 × 6.7	32.23
B3	N	3.3	2.96
B4	d + sh	3.5	3.71
B5	d + sh	3.3	3.11
B6	B	2.4	0.55
B7	B	2.2	0.62
--	flakes (4)	<1cm	0.09
TOTAL:			81.55

### Stage 2

<i>Sherd no.</i>	<i>Inv. no.<sup>d</sup></i>	<i>Part<sup>a</sup></i>	<i>GD<sup>b</sup></i>	<i>Wf (in grams)</i>
B1.1	A	d, n-b	7 × 5.7	16.30
B1.2	C	d, n	6.2	5.83
B1.3	D	b	4.0	2.99
B1.4	h <sub>2</sub>	b	6.2	4.06
B1.5	B	b	4.1	4.79
B1.6	f <sub>2</sub>	b	2.3	0.61
B1.7	f <sub>1</sub>	b	2.2	0.32
B1.8	N	b	2.6	0.49
B1.9	K	b	2.6	0.98
B1.10	L	b	2.3	0.48
B1.11	M	b	1.7	0.63
B1.12	E	b	2.2	0.81
B1.13	G	b	1.3	0.27
B2.1	I	d	6.4	14.80
B2.2	J	d	5.2	11.23
B2.3	h <sub>1</sub>	d	5.3	5.46
TOTAL				70.05

<sup>a</sup>For a definition of abbreviations and location of lamp parts, see Fig. 6; <sup>b</sup> greatest dimension (GD) in cm; <sup>c</sup> core sherd, not included in final total; ud, undetermined; <sup>d</sup> inventory number marked in pen on sherd during experiment; initial total Wf of complete Lamp B: 81.63; total Wf of resulting fragments after Stages 1: 81.55; total Wf of sherds resulting after Stage 2: 70.05; Wf loss of Lamp B after Stage 1: 0.08 (or 0.09%); Wf loss of Lamp B after Stage 2 breakage: 11.58 (or 14.19%); final total Wf of sherds resulting after Stages 1 and 2: 81.09; final total Wf loss of Lamp B after Stage 1 and 2 breakage: 0.54 (or 0.66%).

### Impact test

The impact test conducted on Lamp D resulted in the creation of 67 sherds (D1–D67) and at least 196 flakes, the highest generation of fragments and flakes among all the breakage methods tested (Fig. 12; Table 6). This finding underscores the highly destructive effect of a heavy object impacting a clay picture lamp.<sup>134</sup> The weight of the lamp decreased from its initial 72.27 g to 71.71 g, a 0.56 g or 0.77% loss. In Stage 1, 71.71 g of sherds were created

<sup>134</sup> For discussions on impact stresses regarding pottery vessels, see Rice 2015, 309, 315, fig. 18.2f; Pierce 2005, 129–30.

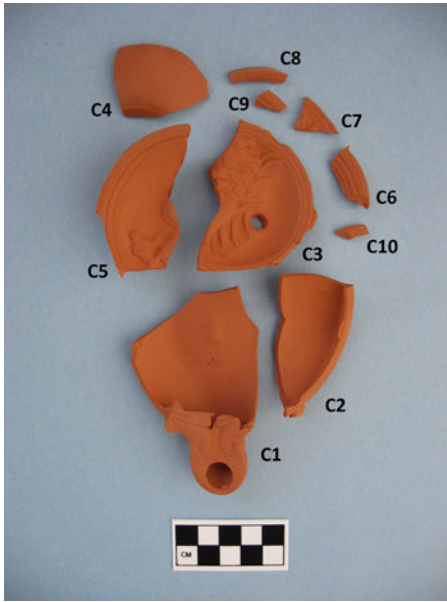


Fig. 10. Lamp C sherd generation after Stage 1 drop experiment. The sherds were arranged by the author for clarity. (E. Lapp.)

(excluding the body core). Lamp D sustained substantial damage, so much so that morphologically it was no longer recognizable as a lamp. Destruction was considerably more pronounced than that resulting from the three drop tests, in which body cores were recognizable as lamps (A1, B1, B2, and C1). Lamp D broke into angular “chips,” cubicles, and flakes. Unlike the drop tests, however, no core fragments resulted from the brick impact. Cubicle-type sherds were more abundant (Fig. 12, e.g., D53, D55, D57), which is indicative of the extreme trauma caused by a heavy object striking the lighting device. Lamp medallions of the angular “chip” variety also resulted (Fig. 12, D12 and D15). The impact test generated a concentrated sherd distribution pattern (Fig. 13). Overall, a high percentage of the sherd weight of Lamps A–D was preserved after the drop and impact tests (an average 0.43% loss).

#### Puncture test

The puncture test conducted on Lamp E failed to produce any lamp sherds. After five attempts to apply considerable pressure against the edge of the filling-hole, the central discus failed to puncture or for that matter, even fracture. It became obvious that breaking out a discus-medallion with a puncturing implement required some expertise (if it was

Table 5.  
Drop test results, Lamp C sherd creation and weights.

#### Drop Test – Lamp C

Stage 1			
<i>Sherd no.</i>	<i>Part*</i>	<i>GD</i>	<i>Wf (in grams)</i>
C1 <sup>a</sup>	n, b	9.2	24.42
C2	sh, b, u, n-b u	6.2	10.10
C3	d	7.1	11.44
C4	b, u	4.5	5.97
C5	d, sh, u, b	6.9	13.18
C6	sh	2.9	1.80
C7	d, sh	1.9	0.73
C8	sh	2.6	0.86
C9	sh	1.4	0.44
C10	u	1.3	0.29
TOTAL			69.23

\*For a definition of abbreviations and location of lamp parts, see Fig. 6; <sup>a</sup> core sherd; initial total Wf of complete Lamp C: 69.57; total Wf of resulting fragments after Stage 1: 69.23; Wf loss of Lamp C after Stage 1 breakage: 0.34 (or 0.49%); Stage 1, Wf of Lamp C body core after breakage: 24.42; total Wf of resulting fragments after Stage 1: 69.23.



## Roman picture lamp breakage rituals

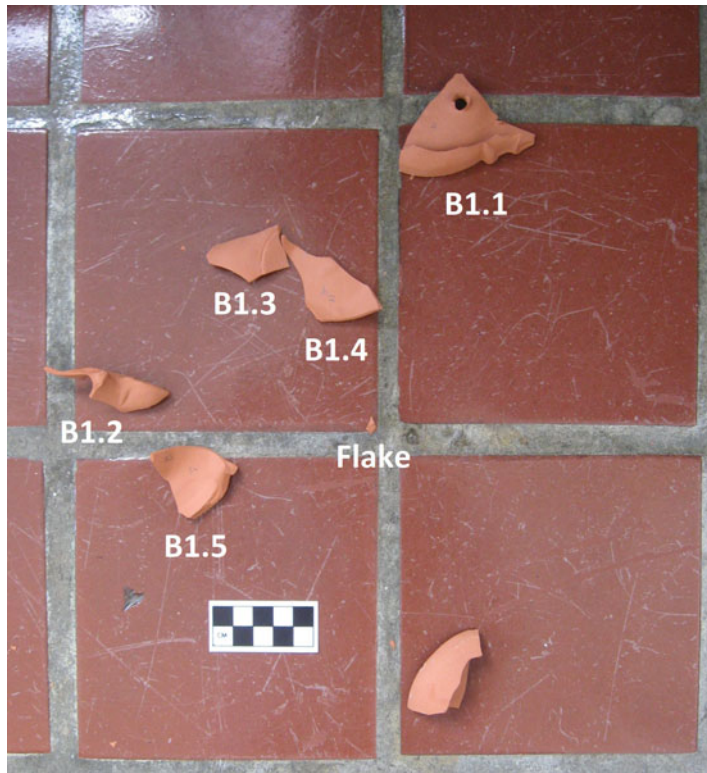


Fig. 11. Sherd scatter pattern resulting from drop experiment (Stage 2) conducted on Lamp B. (E. Lapp.)

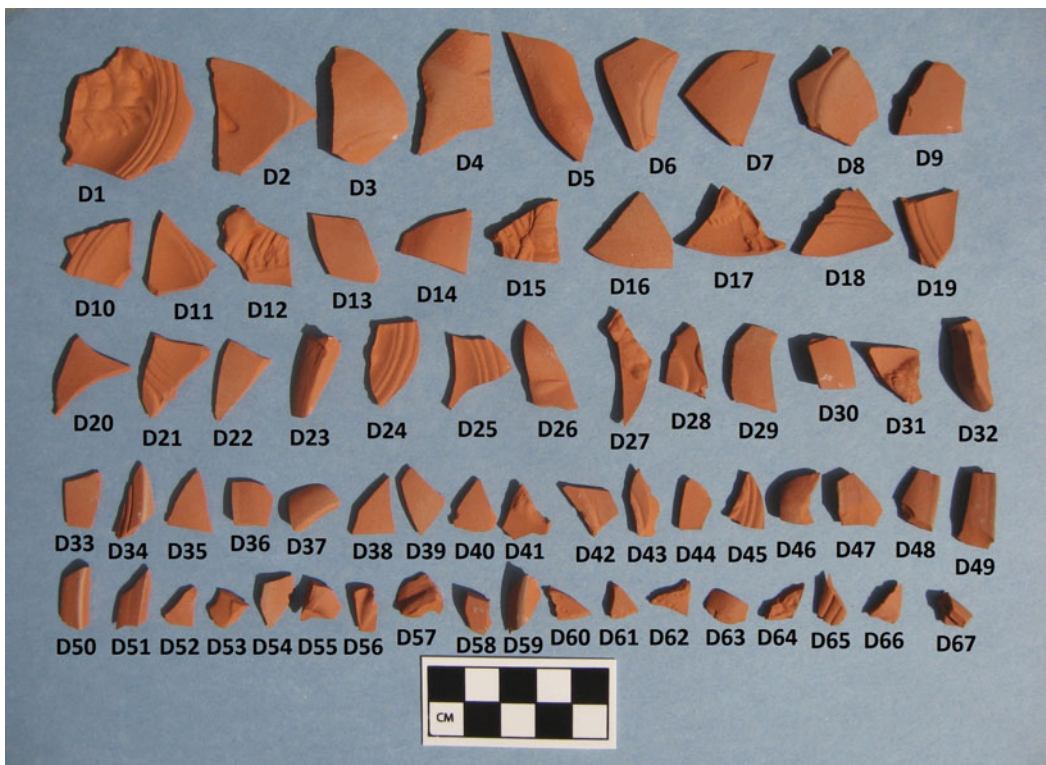


Fig. 12. Lamp D sherd generation after impact experiment. (E. Lapp.)



Table 6.  
Impact test results, Lamp D sherd creation and weights.

*Impact Test – Lamp D*

<i>Stage 1</i>				
<i>Sherd No.</i>	<i>Inv. No.<sup>a</sup></i>	<i>Part<sup>b</sup></i>	<i>GD</i>	<i>Wf (in grams)</i>
D1	1	d + sh	4.3	5.95
D2	2	b	3.6	3.07
D3	3	b	3.5	2.46
D4	4	n/n-b u	3.9	2.43
D5	5	ud	4.2	2.26
D6	6	b	3.2	1.92
D7	7	ud	2.8	1.88
D8	8	b	2.8	1.87
D9	12	d	2.8	1.49
D10	23	sh	2.6	1.44
D11	9	ud	2.4	1.43
D12	32	n + n-b	2.5	1.36
D13	10	d + sh	2.5	1.33
D14	11	d+ sh	2.3	1.33
D15	16	ud	2.4	1.30
D16	13	b	2.7	1.27
D17	21	d + sh + n-b	2.6	1.23
D18	17	d	2.8	1.21
D19	18	d + sh	2.4	1.21
D20	24	d + sh	2.6	1.20
D21	19	d	2.3	1.17
D22	14	u <sup>a</sup>	2.3	1.15
D23	15	d	2.2	1.14
D24	20	ud	2.7	1.07
D25	26	n/n-b u	2.7	1.05
D26	29	ud	2.2	1.00
D27	49	sh	2.1	1.00
D28	30	u <sup>a</sup>	1.8	0.99
D29	25	d + sh	2.2	0.92
D30	50	sh	1.8	0.90
D31	27	d	3.2	0.85
D32	34	sh	2.2	0.80
D33	22	ud	2.3	0.79
D34	37	n	1.5	0.78
D35	31	d	2.1	0.76
D36	36	sh	1.6	0.74
D37	28	n-b	2.1	0.68
D38	48	sh	1.5	0.67
D39	33	u	1.8	0.64
D40	47	sh	1.6	0.64
D41	51	sh	2.1	0.64
D42	35	u	1.8	0.61
D43	39	u	1.9	0.61
D44	59	sh	1.9	0.61
D45	55	n-b	1.1	0.61
D46	46	n	1.5	0.60
D47	38	u	1.9	0.55
D48	41	d	1.6	0.52

*(Continued)*

## Roman picture lamp breakage rituals

**Table 6.** Continued.

### *Impact Test – Lamp D*

#### *Stage 1*

<i>Sherd No.</i>	<i>Inv. No.<sup>a</sup></i>	<i>Part<sup>b</sup></i>	<i>GD</i>	<i>Wf (in grams)</i>
D49	42	b	1.6	0.52
D50	57	n-b + n-b u	1.3	0.51
D51	58	sh	1.0	0.47
D52	40	u	1.5	0.46
D53	45	d + sh	1.6	0.44
D54	44	unid	1.4	0.42
D55	54	sh	1.7	0.42
D56	43	b (?)	2.0	0.39
D57	67	sh	0.9	0.37
D58	53	unid	1.2	0.35
D59	56	n-b u	1.3	0.35
D60	63	unid	1.2	0.30
D61	52	unid	1.3	0.27
D62	60	sh	1.4	0.26
D63	65	r	1.4	0.26
D64	62	unid	1.2	0.24
D65	64	d	1.5	0.24
D66	61	unid	1.0	0.22
D67	66	unid	1.3	0.20
--	--	flakes	<0.02	4.89
<b>Total</b>				<b>71.71</b>

\*For a definition of abbreviations and location of lamp parts, see Fig. 6; <sup>a</sup> inventory number marked in pen on sherd during experiment; <sup>b</sup> remnant of plain flat shoulder; r, ridges around discus only; unid = unidentifiable; initial total Wf of complete Lamp D: 72.27; total Wf of resulting fragments after Stage 1: 71.71; Wf loss of Lamp D after Stage 1 breakage: 0.56 (or 0.77%); Stage 1, Wf of Lamp D body core after breakage: 0.0, no body core created.

**Table 7.**

Hammerstone test results, Lamp E lamp medallion-sherd creation and weights.

### *Hammerstone Test – Lamp E*

#### *Stage 1*

<i>Sherd No.</i>	<i>Inv. No.*</i>	<i>Part</i>	<i>GD</i>	<i>Wf (in grams)</i>
E1	1	discus-medallion	5.0	4.54
E2	2	discus-medallion	3.6	2.46
E3	3	discus-medallion	2.8	2.15
E4	4	discus-medallion	2.8	1.75
flakes	--	discus-medallion	<0.02	0.05
<b>TOTAL</b>				<b>10.95</b>

\*Inventory number marked in pen on sherd during experiment; initial total Wf of complete Lamp E: 79.30; Wf of Lamp E after discus-medallion creation: 68.35; Wf loss of Sample E after Stage 1 breakage: 10.95 (or 13.81%). Note: weight of lamp and sherds includes olive oil saturated fabric. For images of discus-type medallions, see Figs. 14 and 15.



Fig. 13. Concentrated sherd pattern resulting from impact experiment conducted on Lamp D. (E. Lapp.)

a result of the second strike, the disc shattered loudly as if made of glass, reflecting the hard firing of the lamp fabric. This test demonstrated that the most effective and controlled means of producing disc-medallion “chips” is the intentional breakage of the disc with a hammerstone tool. It suggests that such chip-medallions found in the archaeological record were created from the deliberate breakage of the disc by the ancient lamp user by dropping or impacting with a brick or hammerstone (Fig. 8, A1.7; Fig. 12, D12 and D15; Fig. 15, E1-4; Table 8).

Hammerstone impacts, however, failed to create round-type lamp medallions. So, if the drop, impact, puncture, and hammerstone methods failed to generate round disc-medallions, how then were they created? One plausible explanation is that some lamp medallions of the round variety were manufactured separately in a mold, as a detailed study of the pottery recovered from the Kerameikos has already demonstrated.<sup>135</sup> This method, however, does not explain the relatively common roundish medallions with jagged edges, which suggest the extraction of the lamps’ central discs by deliberate breakage.

Metal instruments and tools may have been used to extract complete medallions from clay picture lamps. Medical surgical instruments are certainly precise, but they would have been accessible only to a few. Small metal shears were probably the most easily available

possible at all without smashing the entire lamp): the disc was simply too hard to puncture. To determine whether intense heat would somehow weaken the disc sufficiently for puncturing to be successful, Lamp E was lit and extinguished repeatedly over five days. A second puncture test was then carried out following the procedure outlined above. Again, no breakage resulted. Thus, the results of the test indicate that in antiquity, puncturing, at least with a stone tool, was probably not the method used to break out the disc to create medallions.

#### *Hammerstone test*

The hammerstone test conducted on Lamp E resulted in the creation of four lamp medallions of the angular “chip” variety (Figs. 14 and 15, E1–E4; Table 7). The weight of the lamp decreased from its initial 79.30 g to 68.35 g, a 10.95 g or 13.81% loss of weight. In Stage 1, 10.95 g of sherds were created. Except for a missing disc, Lamp E’s morphology was fully preserved after the Stage 1 impacts, and it remained functional and recognizable as an oil lamp. As

<sup>135</sup> Kübler 1952, 99–145.

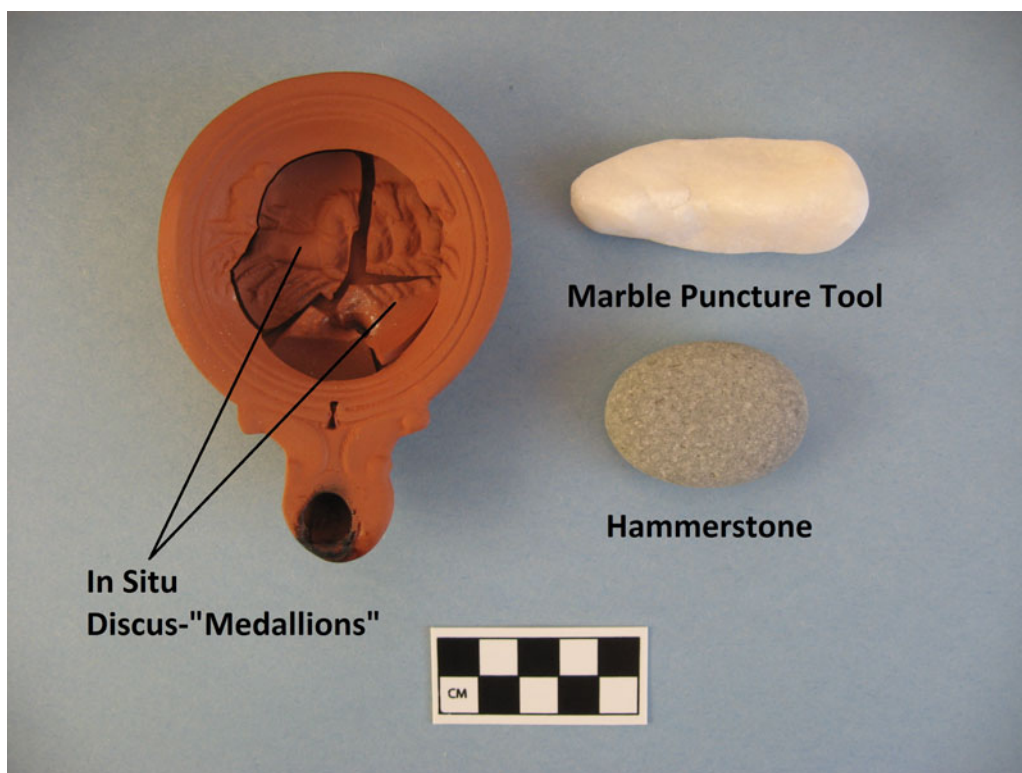


Fig. 14. Picture lamp replica intentionally broken using a hammerstone (lower right) and showing lamp medallions *in situ* (left). The white marble tool used for the puncture experiment is also shown (upper right). (E. Lapp.)

tool among everyday folks for cutting and snipping the discus out of the lamp. The jagged, haphazard edges of several medallions found at the Vocontian sanctuaries and the Arles-Rhône indicate cutting,<sup>136</sup> as do the snapped edges exhibited by the Tarsus lamp medallion with Athena (Fig. 1) and the sharp and angular edges of the discus-openings of the Beth Shean and Qiryat Tiv'on lamps. An alternative method might have been the insertion of the tip of a small, finger-length saw into the filling-hole, where the cutting around the discus would begin. A small hammer and chisel might work, too, but one would have to be careful not to shatter the discus with the forceful pounding motion. A taut, back-and-forth motion with a metal wire or string inserted into the filling-hole could plausibly create a cut around the motif, depending on the softness of the lamp fabric, as a result of friction. The base of the lamp would need to be missing, though, to perform this arduous task.

Common tools recovered from the Roman-period pottery workshop excavations at Sagalassos, particularly iron hairpins, stylus point-tools, and fettling knives,<sup>137</sup> are the types of tools that could have been used to make incisions around the discus-motifs of picture lamps to extract medallions. These tools not only occur in pottery workshops, but are

<sup>136</sup> Chrzanovski and Djaoui 2018, 68, fig. 4a and b.

<sup>137</sup> Murphy and Poblome 2012, 202–3, table 1, nos. 10 and 12, fig. 2f, g, h.

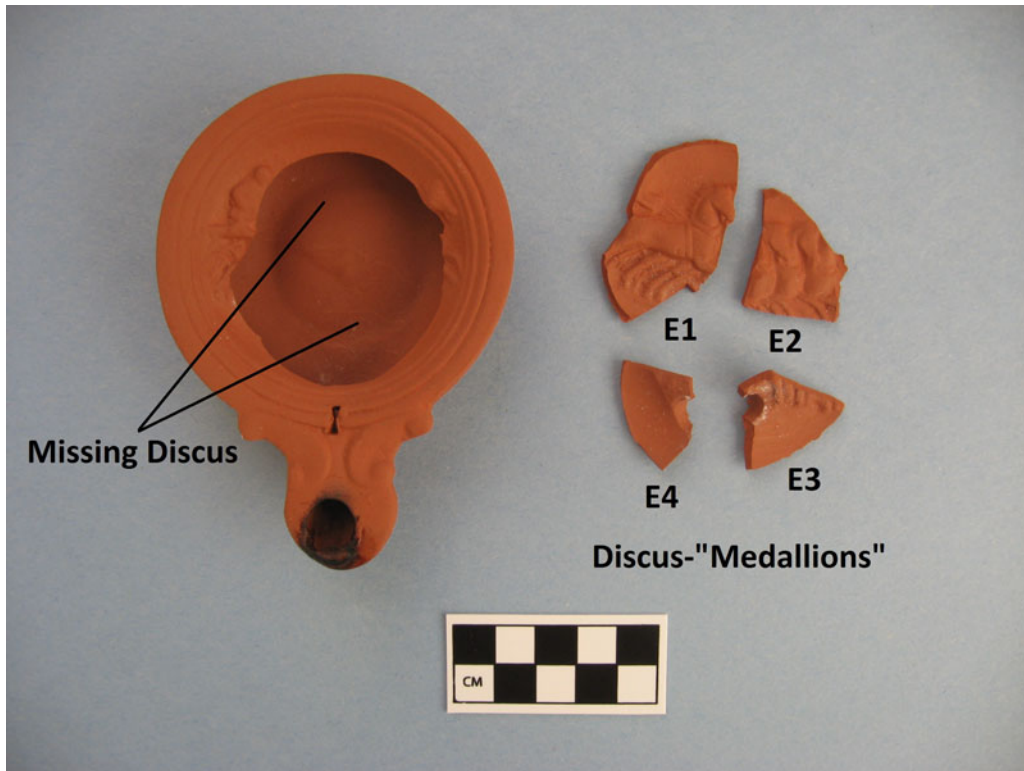


Fig. 15. *Picture lamp replica intentionally broken using a hammerstone and showing missing discus and resulting lamp chip-type medallions (arranged by author). (E. Lapp.)*

also common and available in domestic contexts, such as the Patrician House and Lintel House at Meiron.<sup>138</sup> The iron nails and hooks recovered from the sanctuary at Lachau have been interpreted as votive objects<sup>139</sup> but would have been sufficiently sharp and pointed to cut around the discus for its extraction. In most cases, a discus image would be easier to extract from a picture lamp manufactured with a soft-fired calcium carbonate clay than with a hard-fired, brittle clay.

As the results of the hammerstone experiment substantiate, the central discus of a picture lamp can be easily broken without destroying the vessel's body using quick firm strikes with a large pebble. Medallion chips are also generated using this method, should the lamp-owner desire them. However, as I have explained, the extraction of a complete round medallion with the discus scene still intact poses a greater challenge. Did worshippers remove discuses in domestic settings before arriving at a cave sanctuary or sacred spring where they would toss the medallions during rituals? Or did they bring their tools with them to perform this procedure?

<sup>138</sup> Meyers, et al. 1981, 216, pl. 9.4, nos. 12–15; 50–77, iron blades from a domestic context (MI, MII, and MVII). The hard-points of highly available iron nails could have been used, too (for examples, see Meyers et al. 1981, 213–14, pl. 9.1, nos. 1–30, pl. 9.2, nos. 1–310).

<sup>139</sup> Rouzeau, et al. 2016, 156–60, fig. 7.



## Roman picture lamp breakage rituals

Table 8.  
Comparison of lamp breakage experiment results.

<i>Sample</i>	<i>Test</i>	<i>Initial Wf</i>	<i>Sherd Creation</i>		<i>Total no. sherds</i>	<i>End Wf</i>	<i>Wf Loss (% Wf Loss)</i>
			<i>Stage 1</i>	<i>Stage 2</i>			
A	Drop	70.72	5 (21.34) 1 <sup>flake</sup> (0.10)	10 (49.09)	16	70.53	0.19 (0.27)
B	Drop	81.63	5 (10.95) 4 <sup>flakes</sup> (0.09)	16 (70.05)	21 <sup>a</sup>	81.09 <sup>b</sup>	0.54 (0.66)
C	Drop	69.57	10 (69.20) 12 <sup>flakes</sup> (0.38)	N/A	10	69.58	0.01 (0.0)
D	Impact	72.27	67 (66.82) ≈196 <sup>flakes</sup> (4.89) <sup>c</sup>	N/A	67	71.71	0.56 (0.77)
E	Punct. <sup>d</sup>	72.98	0 (72.98)	N/A	0	72.98	0.0 (0.0)
E	Hamst. <sup>e</sup>	79.30 <sup>f</sup>	4 (10.90) 7 <sup>flakes</sup> (0.05)	N/A	4	68.35 <sup>f</sup>	10.95 (13.81)

<sup>a</sup>Core sherds B1 and B2 are not included in total number of sherds created, but the fragments resulting in their breakage in Stage 2 are included; <sup>b</sup> the end Wf excludes weights of Stage 1 core sherds B1 and B2 because they were further broken in Stage 2, where the weights of their respective resulting fragments are included in the final total Wf value; <sup>c</sup> average = 0.025 g per flake; <sup>d</sup> puncture; <sup>e</sup> hammerstone; <sup>f</sup> lamp fabric saturated with olive oil, see Table 7; N/A, not applicable because Stage 2 was not conducted.

### Conclusion

Picture lamps with missing discuses and lamp medallions represent the most common, usually identifiable archaeological evidence for intentional lamp breakage rituals in the Roman world. This “broken-discus” phenomenon is most prevalent in Roman Palestine but is by no means unique to that region, as, for example, the medallions recovered at the Vocontian sanctuaries and Arles-Rhône shipwreck in southern France indicate. Breakage rituals using picture lamps were practiced by both pagans and monotheists, but probably for different reasons, governed by religion, cult, regionalism, urban cosmopolitanism, or rural cultural norms. The decision to break the discus of a picture lamp reflects either an individual choice (Beth Shean, Qir’at Tivon, and the Shrine of Apollo at Tyre) or collective behavior (Apollonia and Lachau). The main incentive for lamp-breaking centered on the lamp discus, primarily its extraction or mutilation. The hammerstone experiment of this study confirms that a dedicant could break the discus with two quick strikes using a common, large pebble-stone tool. The mechanical drop and impact experiments of this study further demonstrate how picture lamps break, in addition to casting light on the quantity and the types of sherds created. Future breakage experiments should be conducted on replicas of different Roman-period lamp types to compare how they break, too, and to determine whether the types and quantities of sherds produced are specific to the respective lamp groups. The sherd dispersion patterns resulting from the experiments may aid lychnologists in identifying whether drop rituals were performed in sanctuaries, as reflected by scatter patterns, or impact rituals, as suggested by concentrated patterns. In light of the findings presented in this study, it is proposed that lamp *fragments* receive more analytical attention and be viewed through a new lens: namely, whether they result from drop and/or impact rituals, represent the residual sherds of intentional discus breaking and medallion extraction, or were simply caused by practical, post-depositional, or non-human factors.



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