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Editorial

For the opening paper of this volume, Dennis Mizzi has written a clear and concise summing up of the Dead Sea Scrolls, seventy years after their discovery in a cave in the desert. This single discovery has had a monumental impact on our understanding of ancient Judaism, and fundamentally enlarged the body of primary resources from Roman times available for modern study. Yet, the chronology of the site remains a major issue, and particularly questions concerning the origins of the site, whether a Roman villa or religious centre. For many scholars, consensus is far away.

Following this study, there are three on Roman lamps, the first by Renate Rosenthal-Heginbottom on ‘factory-made’ lamps found in modern Israel. Using both petrographic analysis and a detailed study of the iconography, a clear distinction can be made in the discussion of ‘Romanisation’, between the indigeneous Jewish inhabitants and the new population of non-Jews who came to Palaestine after the destruction of the Temple in 70 CE. The second study, by James R. Strange and Mordechai Aviam examines mass production of oil lamps using moulds made either on the site of Shihin or nearby. Their excavation at the site uncovered not just stone moulds for Roman lamps, but also a production centre with a small kiln. This work sheds new light on where lamps were made and their trade in the ancient world. The following research by Anastasia Shapiro starts with an analysis of the petrography of the lamps from Shihin to identify the sources from which the clay used in these lamps came. The lamp clay came from two local sites.

Ido Wachtel, Roi Sabar and Uri Davidovich have written a careful study examining a single site, Bronze and Iron Age Tell Gush Halav (Roman Gischala), with an integrated approach, using both field survey and salvage excavations. Their study shows that the size of site has been often misunderstood. Instead of a large and central site in Galilee, it was rather of medium size, part of a chain of sites along the Meron range.

Moving back in time to the 4th millennium BCE, Samuel Atkins studied the interactions between northeast Africa and the southwest Levant. The earliest commercial exchanges, and routes of transport are evidence of local identities

that indicate both a growth and later withdrawal from foreign ventures. The 1st Dynasty in Egypt consolidated power while at the same time brought more control over trade.

Michel Freikman and Alla Nagorskaya examine the megalithic architecture of the Shephelah region in Israel, and show how this type of architecture, thought to be totally absent from this region, is far more prevalent than ever considered. Often, what was found was mis-identified or poorly dated. The newest data shows that they belong in the EBI period, although many have been destroyed, or their stones used for later construction.

Orit Peleg-Barkat presents her second preliminary report on her excavations at Horvat Midras, a Hellenistic and Early Roman site that was considerably more well off than other nearby sites. The most important find of the excavation so far is the large funerary monument and a monumental podium.

To those who helped in producing this volume, I owe a debt of thanks, and in particular to the reviewers and those who helped proof the texts. This year, Kimberly Czajkowski jumped in the deep end and produced a formidable collection of reviews. Rachael Sparks has been an enormous help again in getting this issue ready for print. Eitan Klein, the Deputy Director of the Unit for the Prevention of Antiquities Looting for the Israel Antiquities Authority, has kindly taken over the responsibility for writing our *Reports from Israel*, which can be found both in this journal and on our website. To all, I owe my gratitude.

Concerning subscriptions, annual membership of the AIAS will include a mailed copy of the journal as well as access to the Society's other activities. Further details, contact information and a membership form are to be found on the AIAS website: <http://www.aias.org> and see our Facebook page: <http://www.facebook.com/IsraelArchaeologyLondon> for more up-to-date information and news.

David Milson
Editor

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A Petrographic Study of Roman Ceramic Oil Lamps

ANASTASIA SHAPIRO

Israel Antiquities Authority

A petrographic study of ceramic oil lamps from nine sites helps to clarify the lithology of these samples indicating their provenance. Four specific groups were identified. The clay used to make the lamps that were found at Shihin certainly came from two clearly-defined sites.

Introduction

A total of 36 ceramic oil lamps and one storage jar were sampled at nine archaeological sites (Fig. 1). The aim is to define the lithology of the samples to attribute them to a production site or to specify the area of their possible provenance.

The results were compared with results from previous investigations and the existing petrographic data. The lamps examined form four petrographic groups, presented below.

1. Motza Marl and Dolomitic Sand

Nine lamps (two from Shihin, one from Kh. Wadi Hamam, one from Tel Rekhes, one from Yodefah, two from Gamla, and two from Makberot B'not Ya'akov) form a clear petrographic group by both matrix and non-plastic inclusions (Fig. 2).

Their matrix is fine calcareous and slightly ferruginous clay with small quantities of quartz silt. The non-plastic inclusions comprise not more than five percent of the sherds' volumes, and are predominantly euhedral rhomboid dolomite crystals with sizes ranging between 0.1 and 0.3 mm. The dolomite is partly decomposed to calcite as a result of firing (decomposition occurs at 500° C when fired in an oxidized atmosphere). Besides the dolomite, there are rare 0.2–0.8 mm lumps of pure ferruginous or silty ferruginous shale, quartz siltstone with calcareous cement, and micritic limestone. Circular (0.2–0.3 mm in diameter) and elongated (0.5 × 1.2 mm) cavities with gray aureoles are sporadic, originating from some fine organic matter that burned away during firing.

The optical properties of the clay and calcium carbonate minerals, along with the presence of the charred aureoles after organic inclusions and/or grayish core indicates a firing temperature of 700° C.

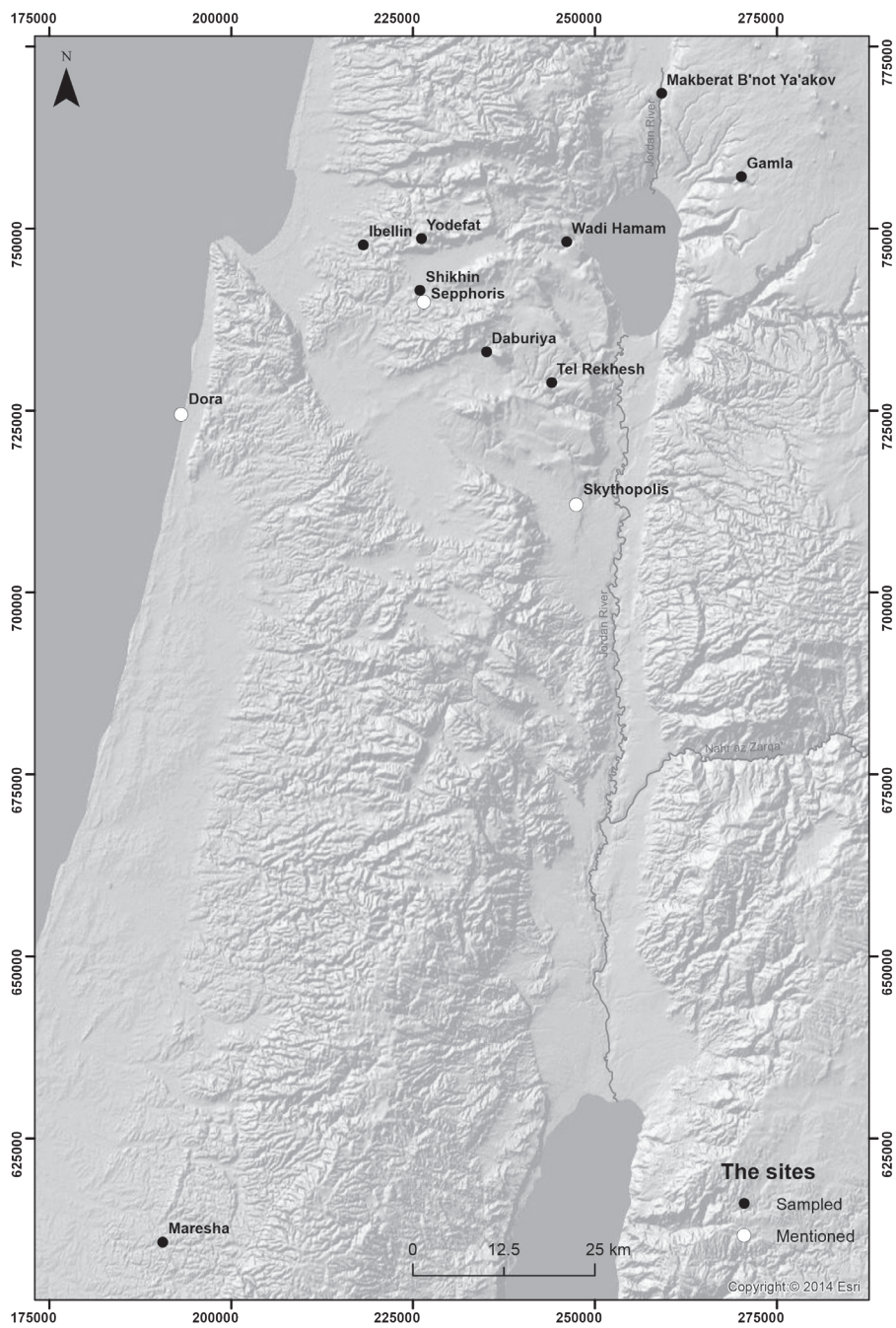


Fig. 1. Survey points at Shihin

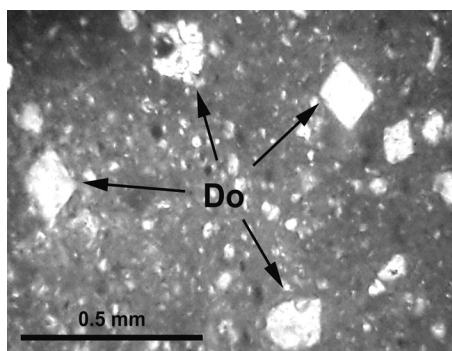


Fig. 2. Motza marl and dolomitic sand

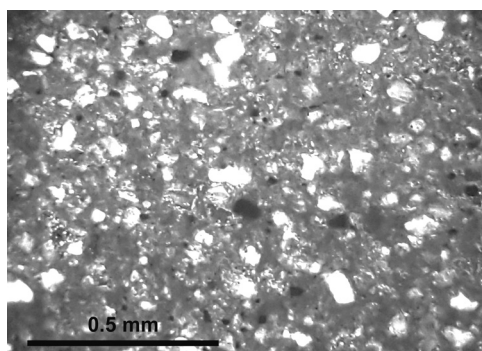


Fig. 3. Ferruginous clay and quartz silt

A comparison with previously examined thin sections of roof tiles and the storage jars from the excavations at Binyanē Ha-Umma, Jerusalem (Shapiro, Berlin and Stone forthcoming), reveals a high degree of lithological similarity between these samples and the lamps discussed here. However, we must keep in mind the different technological requirements for clay dough prepared for oil lamps and dough prepared for roof tiles.

The observed lithology represents the geological environments of calcareous marl and dolomitic sand, with the presence of dolomites and limestones with occasional quartzite nodules. Such a situation agrees with the Cenomanian Judea group, where Motza clay and marl, one above the other, are located between Beit Meir dolomite (lower) and Aminadav dolomitic sand (upper) formations (Ben Tor 1966: 48–52; Sneh and Avni 2008: map). The well-preserved rhombs of the dolomite may indicate that the dolomitic sand was not transported far from the point of its origin (Eisenberg 1993: 1277–1280; Eisenberg 1994: 86).

The pedology of the area is characterized mostly by *terra rosa*, sometimes partly calcareous, originating on top of the carbonate formations described above (Ravikovitch 1969, map). This soil could supply the ferruginous components described within the sherds attributed to the current petrographic group.

As the singular clay type suitable for pottery production within the whole Cenomanian-Turonian sequence of the Judean-Samaritan Mountains, these formations supplied raw materials for pottery production for centuries (Goren 1995: 301; Adan-Bayewitz *et al.* 2008: 53–54; Shapiro forthcoming).

2. Ferruginous Clay and Quartz Silt

Three samples from Maresha (Fig. 3) are characterized by a ferruginous, slightly calcareous clay matrix, comprising ten percent and more of angular and sub-angular quartz silt, possibly aeolian in origin. Accessory minerals in the silt

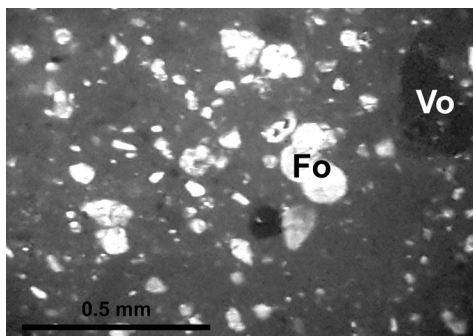


Fig. 4. Terra Rosa group

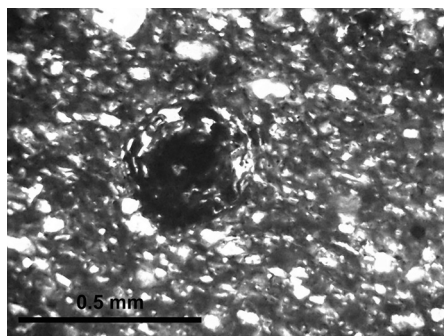


Fig. 5. Foraminiferous marl group

fraction are plagioclase, hornblende, and zircon. Non-plastic inclusions are rare (few in each thin section) and fine (0.1–0.3 mm), and comprise rounded to angular quartz grains, chalk balls, ferruginous clay nodules, and aquatic shell fragments. According to the optical properties of the clay minerals, the firing temperature is estimated at 750° C.

This lithology can be attributed to the loess soils of the Northern Negev or Shephelah. The lack of distinctive coarse inclusions makes it impossible to tighten the area of provenance for these lamps (Boness *et al.* 2016: 192–196, Figs 8, 10, and 11).

3. Terra Rosa, Brown Rendzina, and Foraminifers

Seven lamps (one from I‘billin, two from Daburiyah, three from Shiḥin, and one from Yodefat) and the Shiḥin storage jar sampled as a comparative specimen form the petrographic group characterized by a ferruginous and slightly calcareous matrix (Fig. 4), where silt composes 7 percent to 17 percent of its volume, and is comprised of equal quantities of carbonate material (mainly of foraminifer debris and rare complete chambers), and silty quartz with accessory minute ore nodules, plagioclase olivine and hornblende. Sand-sized non-plastic inclusions comprise rare particles of biogenic chalk, micritic limestone, microfossils, and sporadic ferruginous oolites—opaque, or with concentric inner structure and in some cases there are round voids with tiny opaque ‘crust’ (Fig. 5). There are also some quantities of rounded and elongated voids, apparently left after some organic matter burned away while firing. All of these were apparently part of the initial clay and were not added deliberately by the potter.

The firing temperature is estimated at 700–750° C, since carbonate material within the section partially preserved its optical properties. Some of the samples (1.4, 1.5) were fired in a reduced atmosphere; hence, their cross-sections are gray with a thin (0.2–0.5

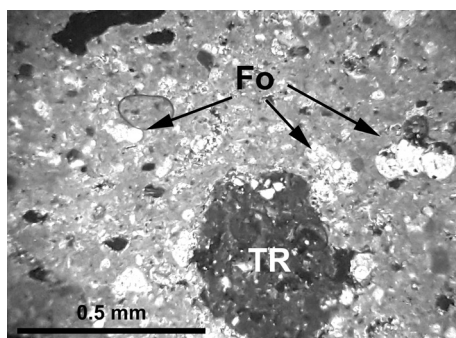


Fig. 6. Terra Rosa group

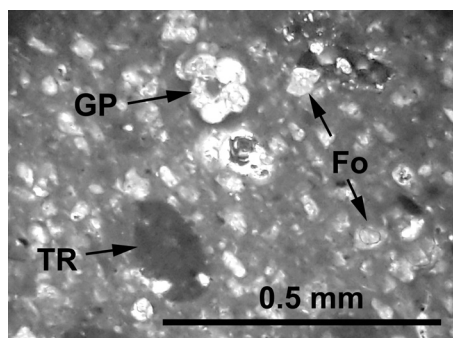


Fig. 7. Foraminiferous marl group

mm), brown layer at the very outer surface. Others were fired with enough oxygen, and their sherds are reddish brown or have a thin grayish core in thick sections.

The most plausible source of raw material for these vessels is *terra rosa* admixed with calcareous rendzina soil, both developing on top of hard limestones and soft foraminiferous chalk respectively, and both appearing in close proximity to Shiḥin (Ravikovitch 1969: map).

The ferruginous oololiths mentioned above are characteristic of Lower Cretaceous formations (Ben Tor 1966: 2), or of soils developing on top of them, and were used for pottery production in different regions through the ages of human history (Greenberg and Porat 1996: 15–16; Glass *et al.* 1993: 276–277; Goren 1995: 302–303; Wieder, Adan-Bayewitz and Asaro 1994: 312, 314; Wieder and Adan-Bayewitz 1999: 334; Shapiro 2012a: 71–72; Shapiro 2012b: 107, 109, Figs 5.7, 5.8). The outcrops of the Lower Cretaceous geological formations closest to Shiḥin are situated about 13 km east northeast from the site, at the northeastern end-flank of the Beit Netofa Valley (Bogoch and Sneh 2008: map). From there, the seasonal water flows could scatter the ferruginous oololiths down the valley. This leads to the proposition that the raw materials for the lamps attributed to this petrographic group were soils collected in the Beit Netofa Valley, which correlates with the results of previous research (Adan-Bayewitz 1993: 78–80; Wieder and Adan-Bayewitz 1999: 335–338). The most suitable materials for pottery production soil was collected by the author in the valley to the north-northeast of Shiḥin.

4. Foraminiferous Marl and Dry Terra Rosa

The most representative group is comprised of seventeen lamps (six from Shiḥin, five from I'billin, three from Daburiyah, and three from Kh. Wadi Ḥamam) share the following lithological affinities: the matrix is calcareous and rather foraminiferous marl containing about 1–2 percent of silty quartz (Fig. 4). In sample 2.3, quartz silt

is present in greater quantities (about 5 percent of the matrix volume). Sample 3.2 contains one silt-size emerald green grain of epidote. Some of the foraminifers' chambers in sample 4.6 are filled with iron oxides.

The sand size inclusions observed within the thin sections are of two types. The plastic inclusions are badly sorted (0.05–0.4 mm) nodules of ferruginous, and sometimes silty, shale. In sample 2.7, this material is dark brown, which causes the section to appear dirty. One plagioclase silt-sized grain can be seen in a ferruginous lump of sample 4.3. Samples 2.4 and 4.5 almost lack *terra rosa* nodules.

The non-plastics mineral inclusions are sporadic and comprise the following: gastropod shell fragments, 0.2–0.3 mm chalk/lime balls and grains of micritic limestone, irregular and sometimes large (0.5–1.5 mm) chunks of foraminiferous chalk. Some samples (3.2, 3.3, and 3.6) lack sand size inclusions; others (2.3, 2.4) contain large (0.2–0.3 mm) foraminifers. A single fragment of ferruginous and foraminiferous shale was observed in sample 2.6, a black nodule of apparently manganese oxides in sample 2.9, and a ferruginous oolite in sample 3.4.

Because of the optically active clay and carbonate minerals, firing temperatures are estimated not to exceed 700° C for most of the lamps attributed to this petrographic group. Some of the samples (2.6, 3.5, and 4.2) were fired at 700–750° C; in these, clay minerals are optically passive, and calcite of the foraminifers is partly decomposed. The grayish brown sherd of sample 3.6 points, apparently, to reduction firing conditions.

The identifiable foraminifers are upper Maastrichtian *Globotruncanella petaloidea* and apparently others of the corresponding age (Keller 2004: 61). The observed lithology may be attributed to the Maastrichtian chalky marl of the Ghareb formation and overlying it Paleocene marls and shales of the Taqiye formation. When fired in an oxidized atmosphere, the pottery made of these shales and marls receives light shades of brown.

The ferruginous and silty nodules within the sherds offers evidence that dried and powdered *terra rosa*, frequently forming on top of some of the hills surrounding Shihin (Ravikovitch 1969: map), was added to the rather calcareous Ghareb and/or Taqiye marl to improve the quality of the clay dough. According to their quantity and quality, other non-plastic inclusions accidentally stayed within the clay and were not added by the potter.

Some of the lithological aspects noted in the samples of this petrographic group suggest that the foraminiferous marl was quarried directly from the natural outcrop and was used by potters as parent material. For example, the presence of well preserved foraminifers, observed in unusually great quantities, suggests that they were not subjected to any notable translocation (erosional transportation) from the bedrock. Had this been the case, it would have caused the destruction of delicate

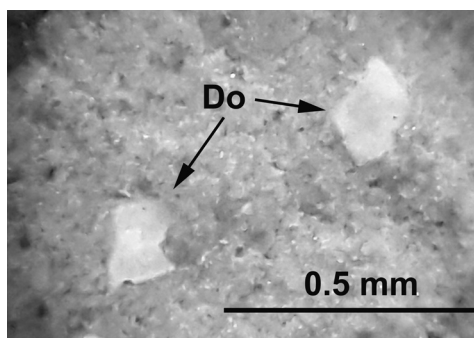


Fig. 8. Motza marl group

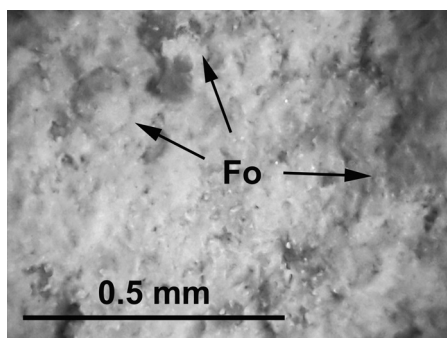


Fig. 9. Foraminiferous marl group

items. Another example is the notable absence of usual ‘dust,’ including a complete lack of organic matter, and the paucity of aeolian silt. In cases when the soil served as the raw material for pottery production, it is impossible to remove these materials (see above: *Terra Rosa*, *Brown Rendzina* and *Foraminifers* petrographic group).

Previous archaeometric research of the comparable oil lamps provided by Adan-Bayewitz *et al.* (2008) include the specimens sampled at Dora, Zippori, and Beit She’an/Scythopolis that are lithologically similar to the current petrographic group (Adan-Bayewitz *et al.* 2008: 60, Table 3). They suggested that the Brown and Pale Rendzina soils were parent materials. This suggestion may require re-assessment in the light of current investigations.

The site of Shiḥin, to whose pottery workshop (J. R. Strange 2012: 10; J. R. Strange 2013: 4–7) this petrographic group corresponds, is situated on a hill, the southern part of which is composed of Ghareb and Taqiye formations, similar to the hill to its northwest (Har Hiye) and the area to the southeast (Sneh and Avni 2008: map). Appearing frequently in Galilee in particular, and throughout the southeastern Levant in general, these formations were intensively used for pottery production since the very early periods of human history (Goren 1991; Goren 1992; a discussion of the equivalent formations within the region can be found in Goren, Finkelstein and Na’aman 2004: 92). Therefore, assigning the provenance for the lamps of this petrographic group to the Shiḥin pottery workshops should be based on the results of the archaeological excavations and surveys, together with the petrographic database.

The light tan colour of the Shiḥin production is reminiscent of the lamps manufactured in Jerusalem workshops (Berlin 2005: 46–48; Adan-Bayewitz *et al.* 2008: 38 and Fig. 3), and we can propose that the Shiḥin potters used the local calcareous marls to produce lamps of ‘Jerusalem’ appearance. Both Jerusalem and Shiḥin lamps were distributed to the same settlements (cf. Daburiyah, I‘billin).

The sample of the Hasmonean pinched lamp was examined under the binocular

microscope only. The lamp has all the signs of over-firing. Its matrix has a gray and glassy appearance. The numerous very soft whitish round and rounded inclusions and cavities observed are apparently foraminifers, decomposed to lime or partly vanished under the firing conditions. In addition, there are rare, rounded dark brownish gray inclusions. The firing temperature may be estimated as above 750° C and probably close to 800° C. This particular lamp can be attributed to the *Foraminiferous Marl and Dry Terra Rosa* group.

Conclusions

The results of the petrographic examinations shows that the oil lamp workshop of Shihin produced lamps from two local raw materials. The first is Beit Netofa valley soils that were also used for the production of storage jars (*Terra Rosa, Brown Rendzina and Foraminifers* petrographic group). The second is calcareous foraminiferous marls of Ghareb and Taqiye formations, apparently mined from hills southwest of and adjacent to Shihin.

Despite the lack of statistically reliable quantities, the distribution of the lamps in this study suggests where further research might lead. In contrast to Gamla, Makberat B'not Yakov, and Tel Rekhes, whose samples came from Jerusalem alone, all the samples from Daburiyah and I'billin were produced at Shihin. At the same time, the examined lamps from Kh.Wadi Hamam, Yodefah, and Shihin itself came from both Shihin and Jerusalem. Jerusalem lamps could have been brought to Shihin as prototypes for the local mould designers. The picture is less clear for Yodefah, whose pottery workshop did not deal with lamps, and Kh. Wadi Hamam, with no signs of a pottery workshop at the site.

The examination of the fresh breaks of the samples under the binocular microscope allows us to distinguish the lamps manufactured by the Jerusalem pottery workshops, (attributed to the *Motza Marl and Dolomitic Sand* petrographic group), from the lamps produced at Shihin, (attributed to the *Foraminiferous Marl and Dry Terra Rosa* group, Figs 16 and 17). This data is helpful for archeologists, allowing them to 'field' read lamps for further statistical investigations, which in turn will produce a better understanding of oil lamp distribution in the region.

Appendix: Stone Moulds

Shihin's oil lamp moulds were carved from two types of stone: a soft, dense chalk and a very soft and porous one. Some of the moulds were carved into waste (cores) from the production of stone measuring cups.

Of the three stone cup production sites known in the area, two are situated on the western slope of Har Yona, and the third is in modern Kefar Reine. All three workshops are artificial caves hewn in layers of dense chalk of the Senonian

Menuha formation (Sneh *et al.* 1998; Shapiro forthcoming a and b).

In addition, the Eocene chalky outcrop formations in the small valley between Har Hiye and Mitzpe Resh Laqish to the southwest of Shiḥin could be used for moulds. Further lithological study may help to solve this puzzle.

Fig. 10. Table of examined lamps

T/S #	Site	Permit	Reg #	Type	Petro group	Provenance
1.1	Maresha		Burial C, C 73, 62-539		Loess	Northern Negev / Shephelah
1.2	Maresha		Burial C, C 148, 62-532		Loess	Northern Negev / Shephelah
1.3	Maresha		Burial C, C 34		Loess	Northern Negev / Shephelah
1.4	Shiḥin		Motti gave me for comparison		Terra Rossa, Brown Rendzina and Foraminifers	Shiḥin – jars
1.5	Ibellin	A-1363	13		Terra Rossa, Brown Rendzina and Foraminifers	Shiḥin – jars
1.6	Daburiya	A-1715	76 / 1		Terra Rossa, Brown Rendzina and Foraminifers	Shiḥin – jars
1.7	Wadi Hammam	G-19/2010	Area A, L. 4A. 011; B. 4A 0026 L		Motza clay	Jerusalem
1.8	Shiḥin	G-58/2015	R 150413, I.13.102; L13004		Motza clay	Jerusalem
1.9	Shiḥin	G-28/2013	R 130028, I.08.06; L8004		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
1.1	Shiḥin	G-28/2013	R 130322, I.10.04; L10001		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.1	Tel Rekhes		Room C, L. 1042, B. 10227, Area G		Motza clay	Jerusalem

T/S #	Site	Permit	Reg. No.	Type	Petro group	Provenance
2.2	Shiḥin	G-58/2015	R 150331, I.13.86, L 13005		Motza clay	Jerusalem
2.3	Ibellin	A-1278	23-Mar		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.4	Ibellin	A-1363	181		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.5	Daburiya	A-1715	23/4, 98-3410		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.6	Ibellin	A-1363	129/1		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.7	Ibellin	A-1278	70		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.8	Wadi Hammam	G-36/2009	L. 3, B. 3B 0005		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.9	Daburiya	A-1715	41/1		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
2.1	Daburiya	A-1715	45/2, 98-3424		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
3.1	Daburiya	A-1715	26/1, 98-3425		Terra Rossa, Brown Rendzina and Foraminifers	Shiḥin – jars
3.2	Ibellin	A-1278	63		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
3.3	Wadi Hammam	G-19/2010	L. 4A 046, B. 4A 0116		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps
3.4	Shiḥin	G-27/2012	R 120272, I.4.43, L 4007		Foraminiferous Marl and Dry Terra Rossa	Shiḥin – lamps

A PETROGRAPHIC STUDY OF ROMAN CERAMIC OIL LAMPS

T/S #	Site	Permit	Reg. No.	Type	Petro group	Provenance
3.5	Shihin	G-27/2012	R 120272, I.6.10, L 6007		Terra Rossa, Brown Rendzina and Foraminifers	Shihin – jars
3.6	Wadi Hammam	G-19/2010	L. 4A 046, B. 4A 0115		Foraminiferous Marl and Dry Terra Rossa	Shihin – lamps
4.1	Shihin	2013		Herodian lamp	Terra Rossa, Brown Rendzina and Foraminifers	Shihin – jars
4.2	Shihin	2013		Herodian lamp	Foraminiferous Marl and Dry Terra Rossa	Shihin – lamps
4.3	Shihin	2013		Herodian lamp	Foraminiferous Marl and Dry Terra Rossa	Shihin – lamps
4.4	Shihin	2013		Herodian lamp	Terra Rossa, Brown Rendzina and Foraminifers	Shihin – jars
4.5	Shihin	2013		Herodian lamp	Foraminiferous Marl and Dry Terra Rossa	Shihin – lamps
5	Shihin	G-45/2016	R160166, I.13.140, L 13014	Pinched lamp	Foraminiferous Marl and Dry Terra Rossa	Shihin – lamps
61	Gamla	A-3039	7012,1614a	Herodian lamp	Motza clay	Jerusalem
62	Gamla	A-3039	7012,1614b	Herodian lamp	Motza clay	Jerusalem
63	Makberat B'not Yakov		From Yodefath project	Herodian lamp	Motza clay	Jerusalem
64	Makberat B'not Yakov		From Yodefath project	Herodian lamp	Motza clay	Jerusalem
122	Yodefath	G-93/1994	VII. Q4.004.13	Herodian lamp	Motza clay	Jerusalem
123	Yodefath	G-113/1996	XI.R17.002.9	Herodian lamp	Terra Rossa, Brown Rendzina and Foraminifers	Shihin – jars

Notes

- 1 The storage jar from Shihin was sampled as comparative material.
- 2 As a first step, the fresh breaks of the sherds were examined under a binocular microscope at magnifications from $\times 20$ to $\times 40$, with the aid of a solution of 5% dilute hydrochloric acid and a steel needle. Then, thin sections were prepared and examined under a polarizing microscope at magnifications between $\times 20$ and $\times 200$. The descriptions of the thin sections were completed with the aid of charts and tables (Whitbread 1986: 80; Orton, Tyers and Vince 1993: 236–239). On the basis of these results and following the usual practice for petrographic studies (Goren 1995: 290), the samples were sorted into ‘petrographic groups’ based on the similar petrographic affinities of the matrix (clay) and sand-size non-plastic inclusions, regardless of archaeological variables such as typology or geographic location of the archaeological find-spot. By this means, comparison of the ceramic assemblage is based solely on the raw materials using independent technical criteria. The petrographic data were compared to the geologic settings in close proximity to the sites, especially those, known as production sites, like Jerusalem, Shihin, and Yodefah, and the surrounding geographic areas.
4. Permit A-1866 (Arubas and Goldfus 2005) courtesy of Benni Arubas.
5. Personal observation from a pottery making experiment.
6. The results of the excavations and surveys at the site undoubtedly reveal oil lamp manufacturing at Shihin (Strange 2012, 2013).
7. The goal is for further surveying the area: the marl quarry or the clay pit. James F. Strange reports that in the 1980s, Mr. Jimmy Ippen, the head of agriculture for Kibbutz Ha-Solelim, told him that, in order to ease their plowing and harvesting of a field, their workers had partially filled in an old clay pit on the hill now identified as Shihin. The southeastern portion of this pit is still visible at the foot of the northwestern slope of the hill. It is visible in aerial photographs taken in 1945. The identification of this depression as the village’s clay pit need to be confirmed.
8. Israel Antiquities Authority excavation in 2001 directed by D. Amit on behalf of construction of road 6400

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