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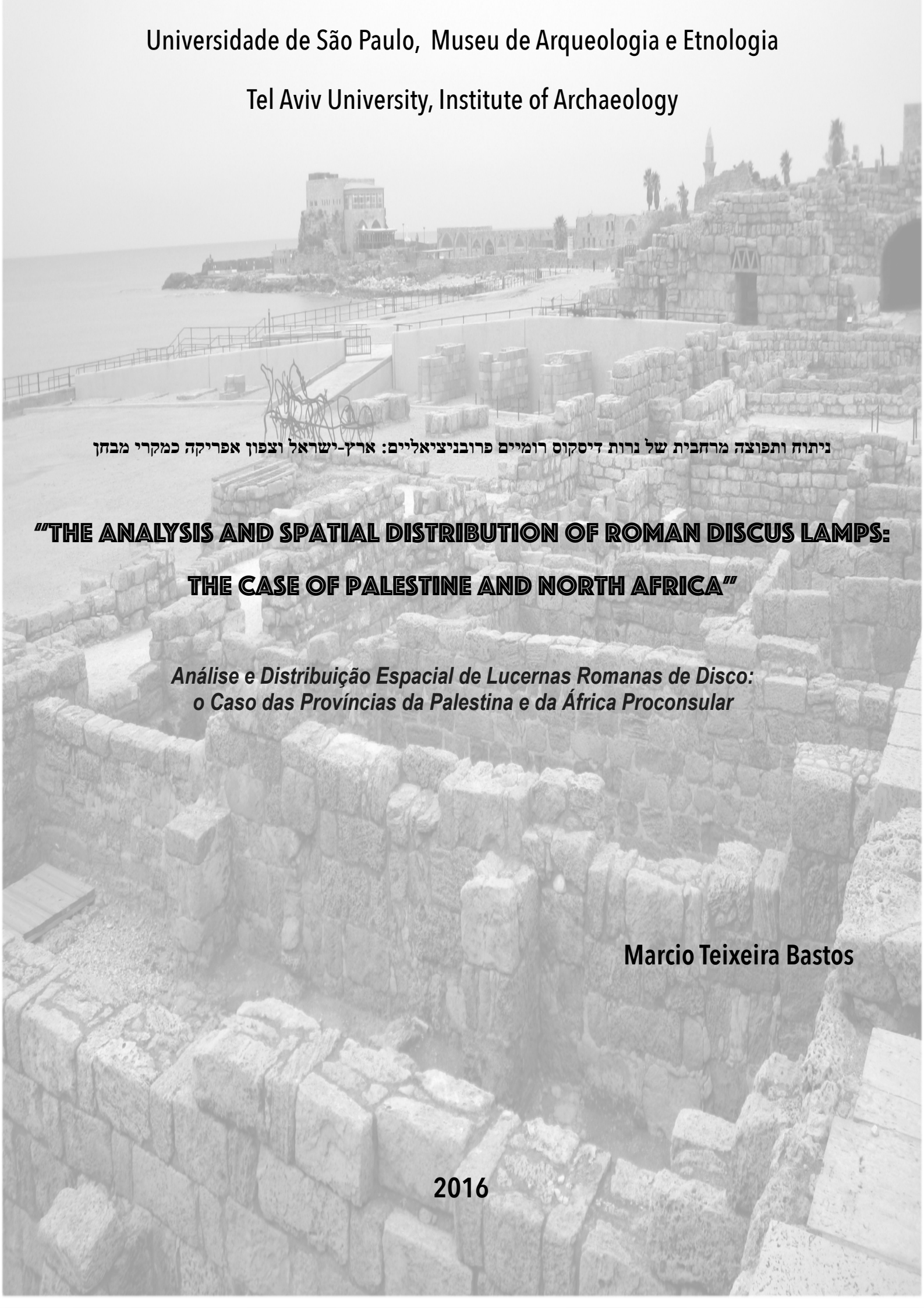
Tel Aviv University, Institute of Archaeology



ניתוח ותפוצה מרחבית של נרות דיסקוס רומיים פרובניציאליים: ארץ-ישראל וצפון אפריקה כמקרי מבחן

"THE ANALYSIS AND SPATIAL DISTRIBUTION OF ROMAN DISCUS LAMPS: THE CASE OF PALESTINE AND NORTH AFRICA"

Análise e Distribuição Espacial de Lucernas Romanas de Disco: o Caso das Províncias da Palestina e da África Proconsular

Marcio Teixeira Bastos

2016

UNIVERSIDADE DE SÃO PAULO
MUSEU DE ARQUEOLOGIA E ETNOLOGIA
PROGRAMA DE PÓS-GRADUAÇÃO EM ARQUEOLOGIA
em co-tutela com
TEL AVIV UNIVERSITY - FACULTY OF HUMANITIES
SCHOOL OF JEWISH STUDIES
INSTITUTE OF ARCHAEOLOGY

MARCIO TEIXEIRA BASTOS

THE ANALYSIS AND SPATIAL DISTRIBUTION OF ROMAN PROVINCIAL DISCUS LAMPS: THE CASE OF PALESTINE AND NORTHE AFRICA

São Paulo - Tel Aviv
2016

MARCIO TEIXEIRA BASTOS

THE ANALYSIS AND SPATIAL DISTRIBUTION OF ROMAN PROVINCIAL DISCUS LAMPS: THE CASE OF PALESTINE AND NORTHE AFRICA

Tese apresentada ao
Programa de Pós-Graduação em
Arqueologia do Museu de
Arqueologia e Etnologia da
Universidade de São Paulo
para obtenção do título de
Doutor em Arqueologia em co-tutela com
Institute of Archaeology,
Department of Archaeology and
Ancient Near Eastern Cultures,
da Tel Aviv University, em Israel.

Área de Concentração:
Arqueologia
Orientadora: Profa. Dra. Maria Isabel D'Agostino Fleming, MAE-USP.
Co-orientador: Prof. Dr. Oren Tal, TAU-IL.
Linha de Pesquisa: Espaço, Sociedade e Processos de Formação do Registro Arqueológico.

São Paulo - Tel Aviv
2016

CONTENTS

To my father's glory and my mother's obstinacy!

Preface

Over the years of research that led to this thesis, people and institutions were critical to the development of this work. In this sense, I dedicate the lines that follow to name and thank the aid, learning and support received during this arduous doctoral process. No doubt, if not for the participation of these people and the support of these institutions, this work would achieve no success.

Start these thanks for the person who at all times was my pillar, protection, shelter and guide during my academic journey. The Professor. Dra. Maria Isabel D'Agostino Fleming of the University of São Paulo (USP), I dedicate my most sincere thanks. We tread a walk that words cannot express the feeling of gratitude, affection and respect I feel. Mabel thou shalt be always my biggest example!

I also thank Prof. Dr. Oren Tal of Tel Aviv University (TAU) for his constant support, friendship gift, as well as his sharp and brilliant teachings. I admire you very much and I feel privileged to have the opportunity to learn and work with you. Thank you for all the help received during my time in Israel at Tel Aviv University.

Prof. Dr. Yuval Goren, also from Tel Aviv University, for his patience, teaching and supervision in the development of petrographic analysis of this work. I appreciate the valuable training and meetings, not only in Israel at the Laboratory for Comparative Microarchaeology TAU, but also in the UK during his sabbatical at the University College of London (UCL).

I thank Prof. Dra. Anna Leone, of Durham University (DUR) for having received me warmly and affectionately during the academic year of study in the UK. Thanks for all the support, guidance and teachings received. Truly a unique experience in my life, which was only possible thanks to her performance. Thank you Anna!

I could not fail to express my thanks to Dr. Kamal Badreshany the advice and aid during my time in the UK. Thanks for the way he received me in Durham Archaeomaterials Research Centre (DARC Lab).

I thank my friend and PhD colleague Doron Bones, of Tel Aviv University, for advice and support. No doubt his generosity and friendship have made the learning process more effective.

To my good friend Prof. Dr. Vagner Carvalheiro Porto, of the University of São Paulo, and Prof. Dra. Maria Cristina Nicolau Kormikiari Passos, for the careful reading and comments during qualifying this work.

I would like to thank some people in a particular way for the help they gave me at some point during this process: James Gillespie, Priscila Ulguim, Lisa Snape-Kennedy, Kristen Hopper, Peter Merlussi and Marcelo Costa.

To my friends, family of Israel, Rami and Revital Berenshtein, Victor and Eti Morgenshtern, Harel and Sackie Chalamish. The love and affection of all of you leaves
me speechless. Especially Ronen and Michal Chalamish, I thank the day that our lives crossed. Thanks for everything!

I thank the staff of the MAE-USP, always willing to help. Officials Fabio Batista dos Santos and Director Prof. Dra. Maria Cristina Oliveira Bruno for their commitment and hard to make this PhD co-trusteeship agreement was made effective.

I thank the funding agency FAPESP for the development of this research and granted financial aid (regular process 2012 / 09071-5 and EPCG numbers 2013 / 15779-3 and 2015 / 23510-0).

Last but not least, I thank my family. My mother, Maria José Teixeira Bastos, courageous woman who at all times was at my side. There are no words to express gratitude and love for you. Without you, nothing. My brother, Daniel Teixeira Bastos, always in my heart. I thank my father, Paulo Roberto Sobral Bastos (*in memoriam*), for his strength and his love sustained me in moments when I felt weak. The promise I made you I accomplish now with this doctorate and my pride is extremely higher to be your child than any other you've ever had one day for me. And how would say Chico Buarque:

"And in his youth, he once told me
That he'd do it ...
Look up!
Oh, my little boy, look up
Look up!
It's my son!"

Marcio Teixeira-Bastos

The Analysis and Spatial Distribution of Roman Provincial Discus Lamps: The Case of Palestine and North Africa

Marcio Teixeira-Bastos

Abstract

This PhD dissertation studies the production and distribution of Roman oil lamps made of clay in the *Orbis Romanorum* during 2nd and 3nd CE by means of thin-section analysis and comparative research, in order to identify workshops in the Levant during Late Antiquity. The results are compared with modes of production and distribution of Roman oil lamps of North African workshops (5th-7th CE), against their social and economic implications. This comparative research seeks trends of continuity, discontinuity and change of style and technology in order to foster our understanding of space and cultural identity definition amongst social groups that used clay lamps as social and mental marker.

Keywords: Petrography, Clay, Roman Lamps, Palestine, North Africa.

Análise e Distribuição Espacial de Lucernas Romanas de Disco: o Caso das Províncias da Palestina e da África Proconsular

Resumo

O presente trabalho procura a articulação das produções de cerâmicas de iluminação romanas tipo disco que estiveram em circulação no *Orbis Romanorum* durante o período Romano e Romano Tardio de ocupação das regiões que compreendiam a Palestina e África Proconsular (1º AEC - 7º EC). A análise comparativa dessas produções tendo inerente a sistematização de dados físico-químicos das argilas de confecção dos objetos pode prover interessantes inferências sobre os locais de fabrico, relações de ruptura e continuidade de estilos e sistemas tecnológicos, bem como fomentar dados para o entendimento da co-constituição do espaço e das identidades culturais dos grupos sociais que se utilizaram desses artefatos na paisagem.

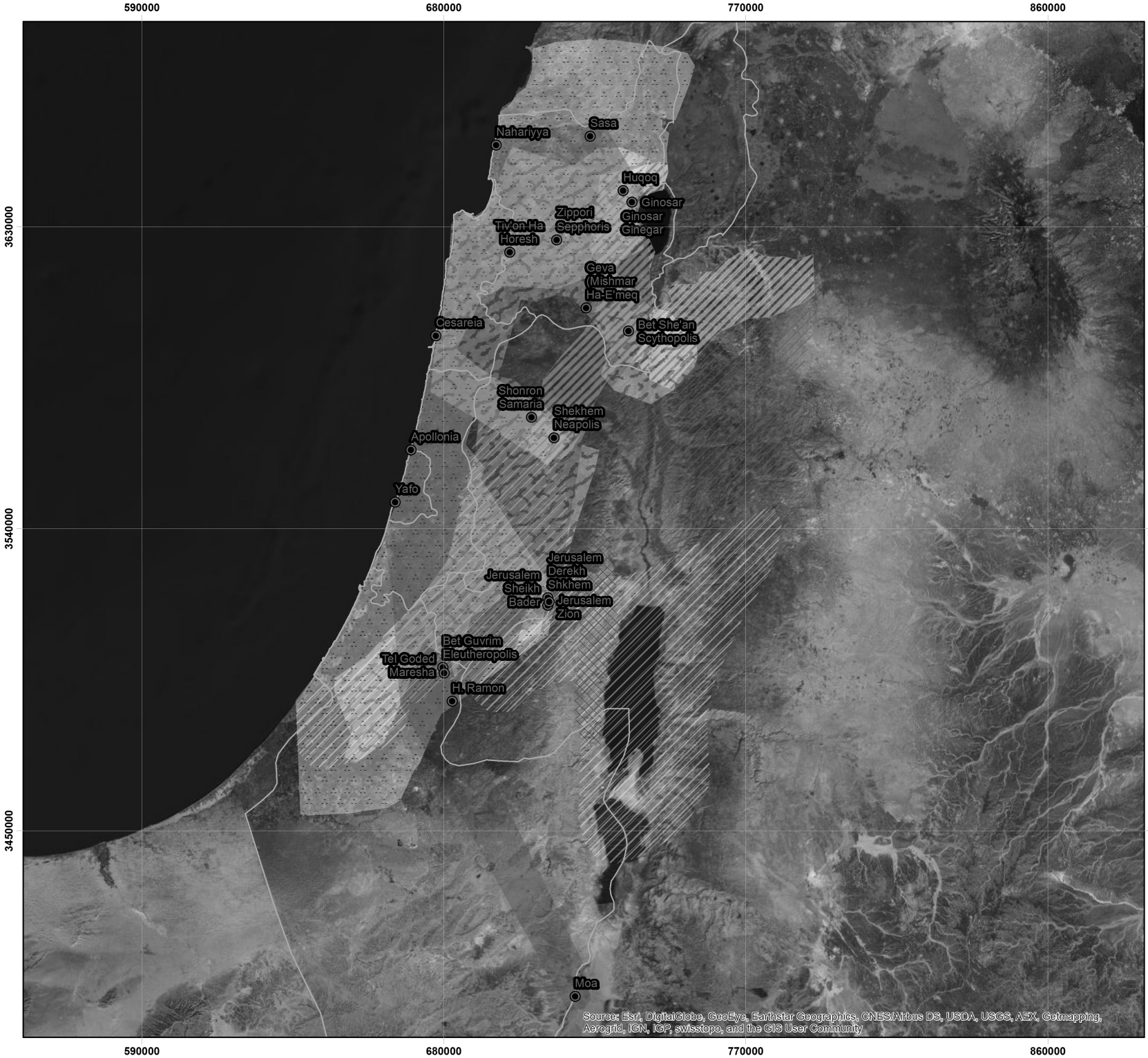
Palavras-chave: Império Romano, Petrografia Cerâmica, Lucernas romanas de disco, Palestina e África Proconsular.

ניתוח ותפוצה מרחבית של נרות דיסקוס רומיים פרובניציאליים: ארץ-ישראל וצפון אפריקה כמקרי מבחן

תקציר: דיסרטציה זו חוקרת את הייצור והתפוצה של נרות חרס רומיים בעולם הרומי במאות השנייה והשלישית לסה"נ, באמצעות ניתוח פטרוגרפי ומחקר משווה, לטובת זיהוי סדנאות ייצור בלבנט. תוצאות המחקר מושוות לאופני היצור והתפוצה של נרות חרס רומיים בסדנאות בצפון אפריקה, על רקע ההשלכות החברתיות והכלכליות של ייצורם. מחקר משווה זה מבקש להתחקות אחר מגמות של המשכיות, שבר ושינוי של סגנון ושל טכנולוגיה לטובת הבנה טובה יותר של הגדרות מרחב וזהות תרבותית בקרב קבוצות חברתית שהשתמשו בנרות כמגדיר חברתי ומנטלי.

מילות מפתח: פטרוגרפיה, טין, נרות רומיים, ארץ-ישראל, צפון אפריקה

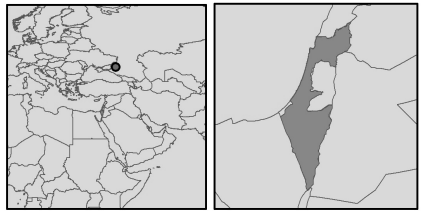
MAPS



Distribuição Espacial das Principais Classes de Lucernas da Palestina Romana.

(Complex and extensive regional distribution patterns of Late Roman-period Palestinian lamps)

2016



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Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

- Disco
- Israel
- Área de Produção de Disco
- Northern Stamped
- Samaritan
- Bilanceolate
- Caesarea Round
- Gerasan Round
- Ovoid

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

LAPP, 1997; Fig.160.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

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Equipe Técnica:

Geoprocessamento: Samuel Victor Kriger de Paiva
Coordenador: Marcio Teixeira Bastos

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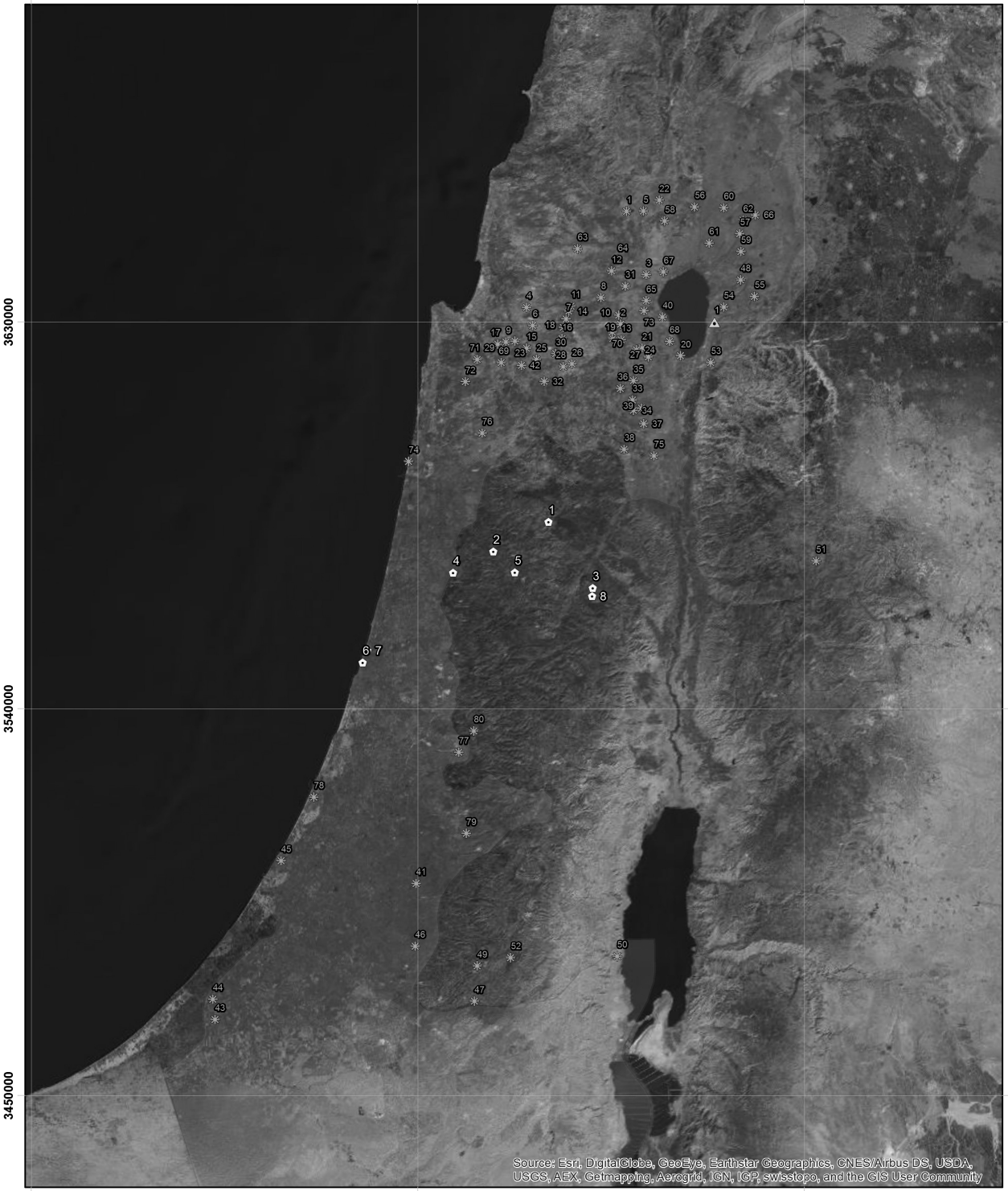
Durham University



Sinagogas - Remains of Synagogue

1 Gevchala
2 Lavi
3 Huqug
4 'Bilin
5 Dalton
6 H.Bor Nashhar
7 H. Ruma
8 H. Netofa
9 Umm el Rashid
10 ⊙ Nitarin
11 H. Qana
12 Mugir
13 Sabeth
14 H. 'Ammudim
15 Bet Lehem
16 Sepphoris
17 Tivʼori
18 ⊙ Shifrin
19 Illanyia
20 Bet Yerah
21 Beit VaGan
22 Qazion
23 H. Koshet
24 Sharona
25 Tel Shimron
26 Nazareth
27 H. Yama
28 Yafʼa
29 H. Buzin
30 'Edud
31 Mimlah
32 Tarbenet
33 Dana
34 Kafra
35 H. Sarh
36 Kafr Misr
37 H. Gevul
38 Beit Alfa
39 Kokhva
40 Tiberias
41 Beit Guvrin
42 Bet Sheʼarim
43 Nirim
44 Kissufim
45 Ashkelon
46 Kishor
47 Anim
48 Deir 'Aziz
49 Eshtemoa
50 'En-Gedi
51 Gerasa
52 Maʼon
53 Hammath Gader
54 Aphek
55 Umm el-Kanatir (Qanatir)
56 Yisod Hamaʼala
57 'Assalleh (Aseliyyah)
58 Qazyon
59 Zumimra
60 Debbora
61 Rafid
62 Karfim (Qatzrin)
63 Pagʼin
64 Kefar Hananya
65 Weradin
66 Dabiya
67 Mt. Kur
68 Hammat Tiberias
69 Tivʼon
70 H. 'Ammudim
71 Husifah
72 H. Summak
73 Arbel
74 Caesarea
75 Beit Sheʼan
76 Tel Yitzhak
77 Modʼin
78 Ashdod
79 'Eti
80 Qiryat Sefer

Templos Romanos - Roman Temples

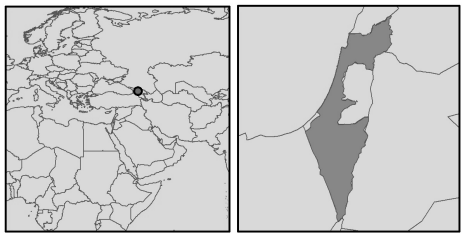
1 H. Susita (Hippos)

Sinagogas Samaritanas

1 Fabma
2 Samaria
3 Hazzan Yaʼaqob
4 Zur Natan
5 el-Khirbe
6 Apollonia
7 Gaside
8 Gerizim

Distribuição Espacial de Sinagogas e Templos Romanos em Israel (Spacial Distribution of Synagogues and Roman Temples)

2016



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Legenda

- Sinagogas - Remains of Synagogue
- Templos Romanos - Roman Temples
- Sinagogas Samaritanas
- Israel

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

AVIAM, 2004.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
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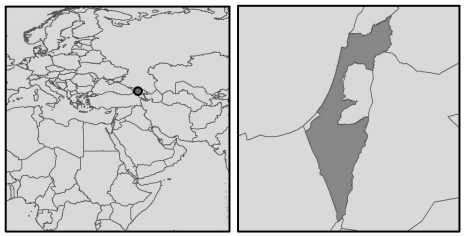
Distribuição Espacial de Sinagogas e Templos Romanos no Norte de Israel (Spacial Distribution of Synagogues and Roman Temples)

2016



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Datum: WGS84

Legenda

- Sinagogas - Remains of Synagogue
- Templos Romanos - Roman Temples
- Israel

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

AVIAM, 2004.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

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Igrejas
1 Masada
2 Kuseifa
3 Kh. Rafat
4 H 'Ammudei Qerayot
5 Tel 'Ira
6 Tel Masos
7 Tell es Sawa
8 Tel Sheva
9 Beer-Sheva
10 Be'er-Shema
11 H Patish
12 Kh. Hura
13 H. Rosh
14 Tel Sera
15 Ruhama
16 Kh. esh-Shalandi
17 Kh. 'Anab
18 Kh. Zanutha
19 Khallet Abu Dabakh
20 Yattir
21 H. 'Anim
22 Ashkelon
23 Kh. Beit Mirsim
24 Kh. el-Bira
25 Kh. Kafr Jul
26 Duma
27 Kh. ed-Der
28 Dhahiriya
29 H Karmel
30 Kefar Aziz
31 Dura
32 Kh. edj-Jof
33 Kh Tawas
34 Yatta
35 Kh. mejdel el-B'a
36 Kh. Edl-Derat
37 Kh. El-Quneitira
38 Kh. Khureisa
39 H. Qerayot
40 Kh. Umm el-'Amed
41 Kh. Beit 'Amra
42 Deir el-'Asal
43 Rujm ed-Deir
44 Kh. el-Qasr
45 Hebron
46 Kh. ed-Deir
47 'Ozem
48 Qeratiye
49 Dikhrin
50 Kh. el-'Arab
51 Maresha
52 Bet Govrin
53 H Qazza
54 Beit 'Awwa
55 Bet Loya
56 'Ein el-Ma'amudia
57 Kh. el-Fira'a
58 el-Bassal
59 H Yonin
60 Kh. el-Kuseir
61 Bet Zur
62 Kh. Kufin
63 Kh. 'Asida
64 Kh. Hubeila
65 H Bet Zecharia
66 Deir Sha'ar
67 H Berachot
68 'Ein 'Arub
69 Bir el-Wa'ar
70 Teqo'a
71 Kh. et-Tina
72 Kh. Khureitun
73 Qasr 'Antar
74 Kh. Umm el-'Amed
75 Mazuba
76 Bezet
77 Hanita
78 Kh. Yarin
79 H 'erav
80 Kh. Karkara
81 Kh. Jelil
82 Me'ona
83 ed-Durh
84 'Evron
85 Shavei Zion
86 Suhmata
87 Kisra
88 Rama
89 Nes 'Amin
90 H. Hesheq
91 Ba'ina
92 H Mahoz
93 Kafr el-Makr
94 Kh. Waziya
95 H. 'Amud
96 Ras ad Dahar
97 Karmi 'el
98 H Qav
99 Tel Keisan
100 Shiqmona
101 Mount Carmel
102 H Ata
103 H Dammon
104 Ramat Yishay
105 Nazareth
106 Har Qedumim
107 Tabor
108 Dabburyia
109 Kafr Kanna
110 Kafr Kama
111 Sarona
112 Sirin
113 'Ulam
114 Tiberias
115 Bet Yerah
116 Bu'eina
117 Arraba
118 Capernaum
119 Kh. Khur
120 Tabgha
121 Kursi
122 Susita
123 Ha-on
124 Na'aran
125 Ramthaniyye
126 Deir Qruh
127 Khisfin
128 Duer el-Loz
129 Dor
130 Nahal Tanninin
131 Caesarea
132 ed-Dumeiri
133 Firasin
134 Burqin
135 Mishmar Ha'emeq
136 Sulem
137 Kh. Jedora
138 Jenin
139 Tamra
140 Beit Qad
141 Bet Ha-Shitta
142 Sede Nahum
143 Tell Basum
144 'Ein Bala
145 Bahan
146 Gerizim
147 'Jacob's Well'
148 Sebastuia
149 'Ein Naqura
150 Sheikh Sha'ala
151 Zababde
152 Bardala
153 Kh. el-Burak
154 Shiloh
155 Jaba'it
156 Tarfin
157 et-Tell
158 Deir-Sim'an
159 Deir el-Qala'
160 Kh. ed´Wuweir
161 'Abud
162 Deir Daqla
163 Deir 'Alla
164 Deir 'Arabi
165 H Zikhrin
166 Nebi Thari
167 Kh. el-Bira
168 Hadid
169 Kefar Truman
170 Kh. Zeifzefiya
171 Mevo modi'im
172 H Sher
173 Kh. el-Hadatha
174 Kh. Syia
175 Gofna
176 Kh. et-Tira
177 Bet Horon (Upper)
178 Kw Suweike
179 Kh. Hayian
180 Kh. Deir Shabab
181 Bethel (Beitin)
182 Sheikh Qatrawani
183 Taiyba
184 Kh. Marjame
185 al´Qasr
186 Kh. el-'Auja-et-Tahta
187 Kh. Beiydat
188 Kh. Umm Zaquma
189 Kh. Kiliya
190 Kh. 'Aeiliat
191 Mukhmas
192 er-Zakhaliq
193 Khallet Danabyia
194 Qarantal
195 Kh. Khudria
196 Nusseib el-'Aweishira
197 Tell Matleb
198 'Nestorian Church"
199 Ashdod
200 Emmaus
201 Kh. 'Atraba
202 'Agur
203 Roglit
204 Tel 'Azeqa
205 Beit Jimal
206 Bet Shemesh
207 'Ein Fatir
208 Kh. en-Nebi Bulus
209 H. Hanot
210 Mat'a
211 H Beth Bad
212 Deir el-Azhar
213 Kh. 'Asida
214 Kh. Kufin
215 'Ein el Kenise
216 el-Qabu
217 'Ein Hanniya
218 'En Karem
219 'Ein el-Jedide
220 Moza
221 Beit Surik
222 el-Jib
223 Kh. el-Biyar
224 St. John the Baptist
225 'Ein Abu Mahmud
226 Deir Hajta
227 Kh. em-Nitle
228 Jericho
229 Kh. Mugheifir
230 St. George
231 Khan Saliba
232 'Ein Fara
233 'Ein Fawwar
234 Herodion
235 Kh. Makhrum
236 Kh. Juhzum
237 Marsaba
238 Hyrcania
239 Bir el-Qattar
240 Bir ez-Zera'a
241 Deir Sha'ar
242 Beit Sahur
243 Bethlemem
244 Beit Jala
245 Kh. Luka
246 Kh. Abu Ghunnein
247 Bir el-Qutt
248 Ramat Rahel
249 Jerusalem
250 H Mizna
251 Ras et-Tawil
252 Deir Mukalik
253 Khan el-Ahmar
254 St. Theodosious
255 Burj el-Ahmar
256 Bethpage
257 Bethania
258 Ma'ale Adummim
259 Qasr 'Ali
260 Qasr er-Rawabe
261 Wadi Suleim
262 Deir es-Sid
263 Barne'a
264 Nizarim
265 H. Gerarit
266 Shellal
267 Magen
268 Bir Abu Jureida
269 esh-Sheikh Nabhan
270 Kissufim
271 Miska Suleiman Agha
272 Masu'ot Izhak

Distribuição Espacial de Igrejas e Monastérios na Palestina Romana

2016

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Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

Igrejas e Monastérios na Palestina Romana

Israel

Legenda no Cartograma

Israel

Contexto do Norte da África e Oriente Médio

AVIAM, 2004.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
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Equipe Técnica:

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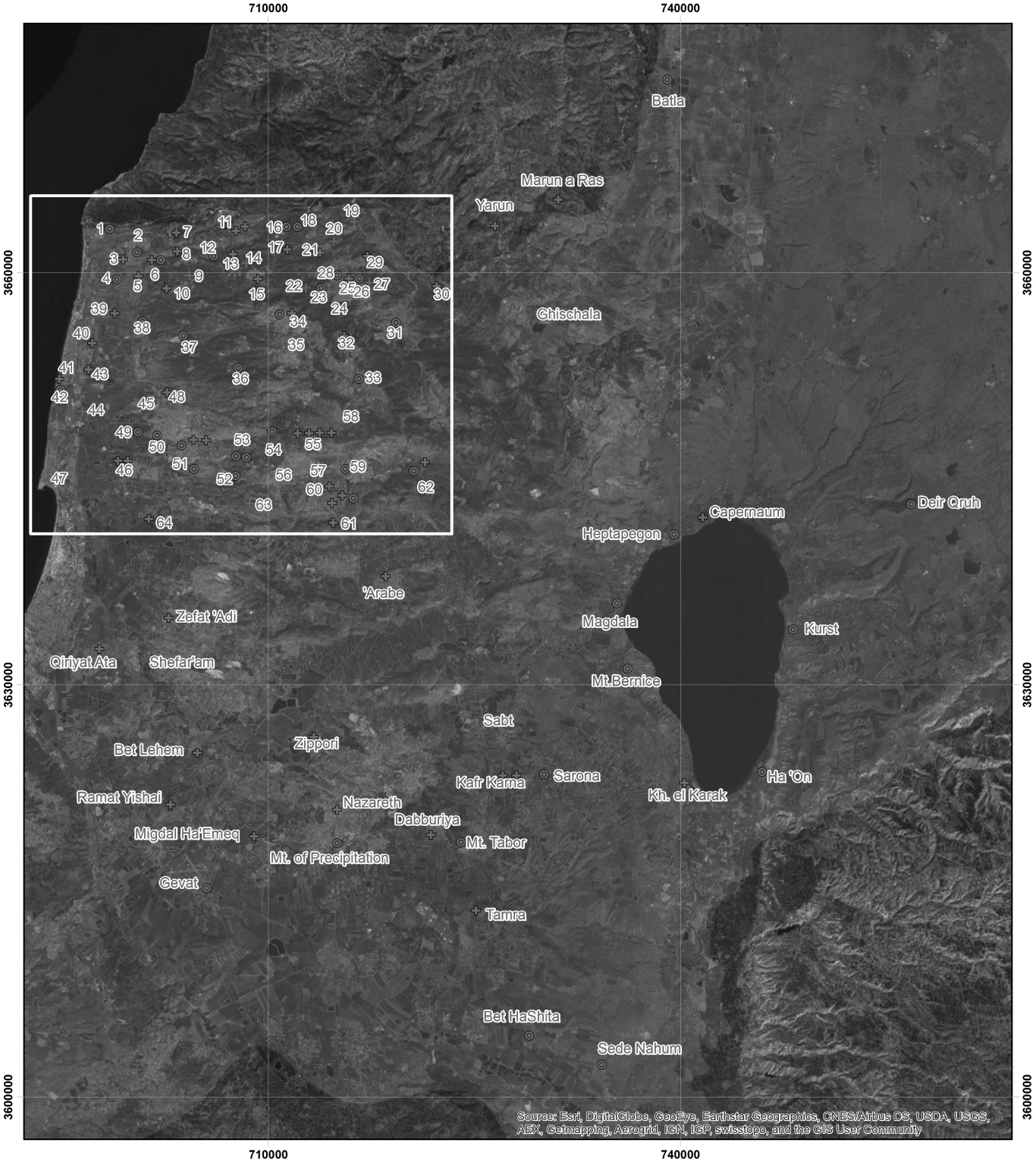

1 HaSulan Ridge
2 Shelomi
3 H. Kenesiyya
4 H. Shaqof
5 Kh. Hamsin
6 Kh. el Ghureiyib
7 Hanita
8 H. Pt Mazuva
9 H. Gez
10 Tel 'Avdon
11 H. 'Erav
12 Kh. Ramah
13 H. Karkara
14 Kh. Din'ila
15 H. Galil
16 Kh. Ma'ar
17 H. Mishmesh
18 Kh. Mujeidal
19 H. Shenuna
20 Igrit
21 H. Serah
22 H. Zawit
23 H. Gov
24 H. Panas
25 Fassuta
26 Bir Abu Faur
27 Tel Rosh
28 H. Siah
29 H. 'Aqrav
30 H. Badid
31 Hurfeish
32 Sukhmata
33 H. 'Oved
34 Mi'ilya
35 Tarshiha
36 Yehl'am
37 Kh el Shubeika
38 el Kabri
39 el Tuweiri
40 Nahariyya
41 Kh. el Mallaha
42 Shave Zyyon
43 'Evron
44 Lohame HaGetaot
45 Bet Ha'Emeq
46 'Amqa
47 'Akko
48 el Makr
49 Dar el Gharbiya
50 H. Medav
51 Kh. el Waziya
52 H. Belaya
53 Kh. el Quseir
54 Nahal Bet Ha 'emeq
55 H. Mahoz; H. Hesheq
56 H. Bir
57 H. 'Ammud
58 Kisra
59 Giv'at Zaqif
60 H. Bata
61 H. Qav
62 Rama
63 H. Gilon
64 Tel Kison

Distribuição espacial de Monastérios e Igrejas no Norte de Israel

2016

N W E S

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Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

- Monastério - Monastery
- Igreja - Church
- Vestígios ocupação cristã - Christian Remains
- Israel

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

AVIAM, 2004.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das provincias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
1/2		1:295.000	2016

Equipe Técnica:

Geoprocessamento: Samuel Victor Kriger de Paiva
Coordenador: Marcio Teixeira Bastos

Realização:

USP — TEL AVIV UNIVERSITY אוניברסיטת תל אביב — Durham University

Distribuição Espacial dos Vestígios Arqueológicos no Norte de Israel - Judeus, Cristãos e Templos Romanos"
(Spacial distribution of the archeological remains of the north os Israel - Jewish, Christians and Roman Temples)

2016

N
W E
S

1:360.000

0 4.000 8.000 12.000 M

Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

- Vestígios de Ocupação Judaica - Jewish remains
- Sinagogas - Synagogue
- Igrejas Bizantinas - Byzantine Church
- Vestígios de Ocupação Cristã - Christian remains
- Templos Romanos - Roman Temple
- Israel

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

AVIAM, 2004.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
1/2		1:360.000	2016

Equipe Técnica:

Geoprocessamento: Samuel Victor Kriger de Paiva
Coordenador: Marcio Teixeira Bastos

Realização:

USP
TEL AVIV UNIVERSITY אוניברסיטת תל אביב
Durham University

Mapa de localização dos sítios arqueológicos do período Romano em Israel 1/2
Localization of the arqueological interest points/places in the Roman Period in Israel 1/2

2016

N
W E
S

1:885.000

0 9.750 19.500 29.250 M

Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

Pontos de Interesse Arqueológico

Israel

0 Apollonia - Villa Romana (Mansio)
1 Cesareia Marítima cidade romana.
2 Beit She'an - Scythopolis cidade romana.
3 Nahariya - Giv'at Katznelson - Sepultamentos
4 Nahariya - Horta 'Eitayim - Sepultamento
5 Tel Barom - instalações agrícolas, largar de azeite.
6 Cesareia - Sepultamento - Caverna A
7 Cesareia - Sepultamento - Caverna B
8 Cesareia - Sepultamento - Caverna C
9 Cesareia - Aqueduto Romano.
10 Cesareia - Área Subúrbio
11 Tel Qasile - Sepultamento Samaritano.
12 Shoham - Sepultamento - Caverna Área A3119
13 Shoham - Sepultamento - Caverna A-2999
14 Shoham - Sepultamento - Caverna A-3209
15 Shoham - Sepultamento - Caverna A-2999
16 Shoham - Sepultamento
17 Horta Anusha - Instalações, terraços agrícolas, fornos de cal, Miqveh - banho ritual Judaico.
18 Horta Zikhrim - Sepultamento - Caverna T1-T3.
19 Menashe Spur - instalações agrícolas
20 Kfar Kama - Área B - Edifício bizantino.
21 Kfar Kama - Sepultamento - Área C - T201, T202.
22 Kh. el-Ni'ana - Sepultamento - Área 100 - Samaritanos.
23 Kh. el-Ni'ana - Oficina cerâmica.
24 Rehovot - Sepultamento - Kirbat Deiran 1
25 Rehovot - Sepultamento - Kirbat Deiran 2
26 Rehovot - Sepultamento - Kirbat Deiran 3
27 Rehovot - Sepultamento - Kirbat Deiran 4
28 Liberais - Qiryat Shemu'el - Sepultamento.
29 Beit Guvrin-Maresha Área de 6 cavernas com sepultamento.
30 Beit Guvrin-Maresha - Igreja bizantina
31 Beit Guvrin-Maresha - Anfiteatro romano
32 Beit Guvrin-Maresha - Igreja bizantina
33 Khirbat El- 'Ein - Sepultamento - Judeus.
34 H. Burgin - Instalações escondidas - Caverna J
35 H. Burgin - Instalações escondidas - Caverna H
36 H. Burgin - Sepultamento - Caverna K
37 H. Burgin - Sepultamento - Caverna M
38 H. Burgin - Sepultamento - Caverna E
39 H. Burgin - Sepultamento - Caverna A
40 H. Burgin - Sepultamento - Caverna L
41 H. Burgin - Sepultamento - Caverna C e Caverna D
42 H. Burgin - Sepultamento bizantino - Caverna B
43 H. Burgin - Cistern - poço - Caverna G
44 H. Burgin - Sepultamento - Caverna U
45 H. Burgin - Sepultamento - Caverna Z
46 H. Burgin - Sepultamento - Caverna F
47 H. Burgin - Sepultamento - Caverna W
48 H. Burgin - Sepultamento - Caverna V
49 H. Burgin - Sepultamento - Caverna S
50 H. Burgin - Sepultamento bizantino - Caverna T
51 H. Burgin - Instalações escondidas - Caverna J
52 H. Burgin - Instalações escondidas - Caverna H
53 Bet Guvrin - Horbat Ohad - Sepultamento - Cenas mitológicas.
54 Pardesia - Igreja bizantina
55 Shelomi - Sepultamento cristão
56 H. Kenessiyya Igreja bizantina.
57 Elqosh - Sepultamento romano
58 Bania - Panias - Templo romano
59 K. el-Hawarit - Oficina cerâmica - vasos de mesa, panelas e jarras.
60 'Ar'ara - Sepultamento Samaritano
61 Qiryat Ata - Sepultamento romano tardio
62 Qiryat Ata - Sepultamento romano tardio
63 Tel 'Afar - Edifício bizantino
64 Midgal Ha-'Emeq - Área 1 Cemitério romano e bizantino
65 Midgal Ha-'Emeq - Área 5 Cemitério romano e bizantino
66 Midgal Ha-'Emeq - Área 4 Cemitério romano e bizantino
67 Midgal Ha-'Emeq - Área 2 Cemitério romano e bizantino
68 Midgal Ha-'Emeq - Área 3 Cemitério romano e bizantino
69 Fardisya - Area A - Lagares, sepultamentos, forno de ca romano e bizantino.
70 Fardisya - Area B - Sepultamentos (arcossólios) e prensa de óleo.
71 Iqrit - Sepultamento romano
72 Horbat Rozez - edifícios e instalações bizantina - Samaritanos.
73 Shelomi - mosaico de igreja bizantina
74 Jerusalém - Mt. Scopus - Sepultamento - Caverna 1
75 Jerusalém - Mt. Scopus - Sepultamento - Caverna 2
76 Jerusalém - Mt. Scopus - Sepultamento - Caverna 3
77 Jerusalém - Mt. Scopus - Sepultamento - Caverna 4
78 Jerusalém - Mt. Scopus - Sepultamento - Caverna 5
79 Jerusalém - Mt. Scopus - Sepultamento - Caverna 6
80 Diskin - Jerusalém
81 Jerusalém - Cardo Oriental Colônia Aelia Capitolina.
82 Khirbat el-Mughram - Sepultamento judeus
83 'En Ya'al - Jerusalem
84 Ha-Horesh - Qiryat Tiv'on - Sepultamento em caverna.
85 Naufrágio romano
86 Baqa el-Gharbiya - Área 1 - Edificações romanas.
87 Baqa el-Gharbiya - Área 2 - Edificações romanas.
88 Baqa el-Gharbiya - Área 3 - Edificações romanas.
89 Kabul - Sepultamento - Caverna 1
90 Kabul - Sepultamento - Caverna 2 - 4
91 Kabul - Sepultamento - Caverna 3
92 Kabul - Sepultamento - Caverna 4
93 Kabul - Sepultamento - Caverna 5
94 Kabul - Sepultamento - Caverna 6
95 Zur Yig'al - H.Hanut - H. Ra'ash e Eyval - zonas de agricultura e industria periodo Romano e Bizantino
96 El-Qabu - sítio agrícola
97 Horta Geliot - Villa Romana com período bizantino.
98 Naufrágio romano
99 Siqmona - bizantino - Lagar grande, sepultamentos em caverna (12 tumbas) e edifícios - mosteiro cristão.
100 Horbat Kamon - habitação agrícola.
101 Ashqelon
102 Ashqelon - Sepultamento judeus, cristãos e romanos
103 Horta Biz'a - Edificações romanas - Áreas A-C
104 Horbat 'Illin - Tumbas, cisternas e instalações subterrâneas.
105 Kirbat el-Thahirya - Edifício e prensa de óleo bizantina
106 Naufrágio romano
107 Horta Tittora - Instalações agrícolas - prensas de óleo, britagem, fornos de cal e cisternas.
108 Ginosar - Ginnegar - Sepultamento Cristão.
109 Horbat Rodem - Oficina cerâmica - recipientes armazenamento.
110 'Ein el-Sha'ara - Umm Al-Fahm - Sepultamento romano
111 Ben Shemen - Sepultamento - Caverna A - romano e bizantino
112 Ben Shemen - Sepultamento - Caverna B - romano e bizantino
113 Ben Shemen - Sepultamento - Caverna C - romano e bizantino
114 Ben Shemen - Sepultamento - Caverna D - romano e bizantino
115 Ben Shemen - Sepultamento - Caverna E - romano e bizantino
116 Ben Shemen - Sepultamento - Caverna 1 - 4 - romano e bizantino
117 Be'er Sheva - Área A - Instalações agrícolas (ED 100-400)
118 Be'er Sheva - Área B e D - Instalações agrícolas
119 Be'er Sheva - Área C - Instalações agrícolas
120 Be'er Sheva - Área E - Instalações agrícolas
121 Horbat Yagur - Edificações romanas.
122 Alone Abba - Prensa de óleo romana.
123 Horbat Qastra (Castra) - Cavernas com Miqveh - 1070 e 1071.
124 Khirbat el-Burj - Áreas A e B - Banho romano, mosaicos, lagar, e tumbas.
125 Horbat Nazur - Área E
126 Baqa el-Gharbiya
127 Tel Lod - Edificações romano e bizantino.
128 Horvat Omrit
129 Horbat Susita - Templo Romano
130 Beit She'an Templo Romano.

Legenda no Cartograma

Israel

Contexto do Norte da África e Oriente Médio

Ver "Mapa de localização dos sítios arqueológicos do período Romano em Israel 2/2" para detalhamento dos locais com sobreposição de pontos.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
1/2		1:885.000	2016

Equipe Técnica:

Geoprocessamento: Samuel Victor Kriger de Paiva
Coordenador: Marcio Teixeira Bastos

Realização:

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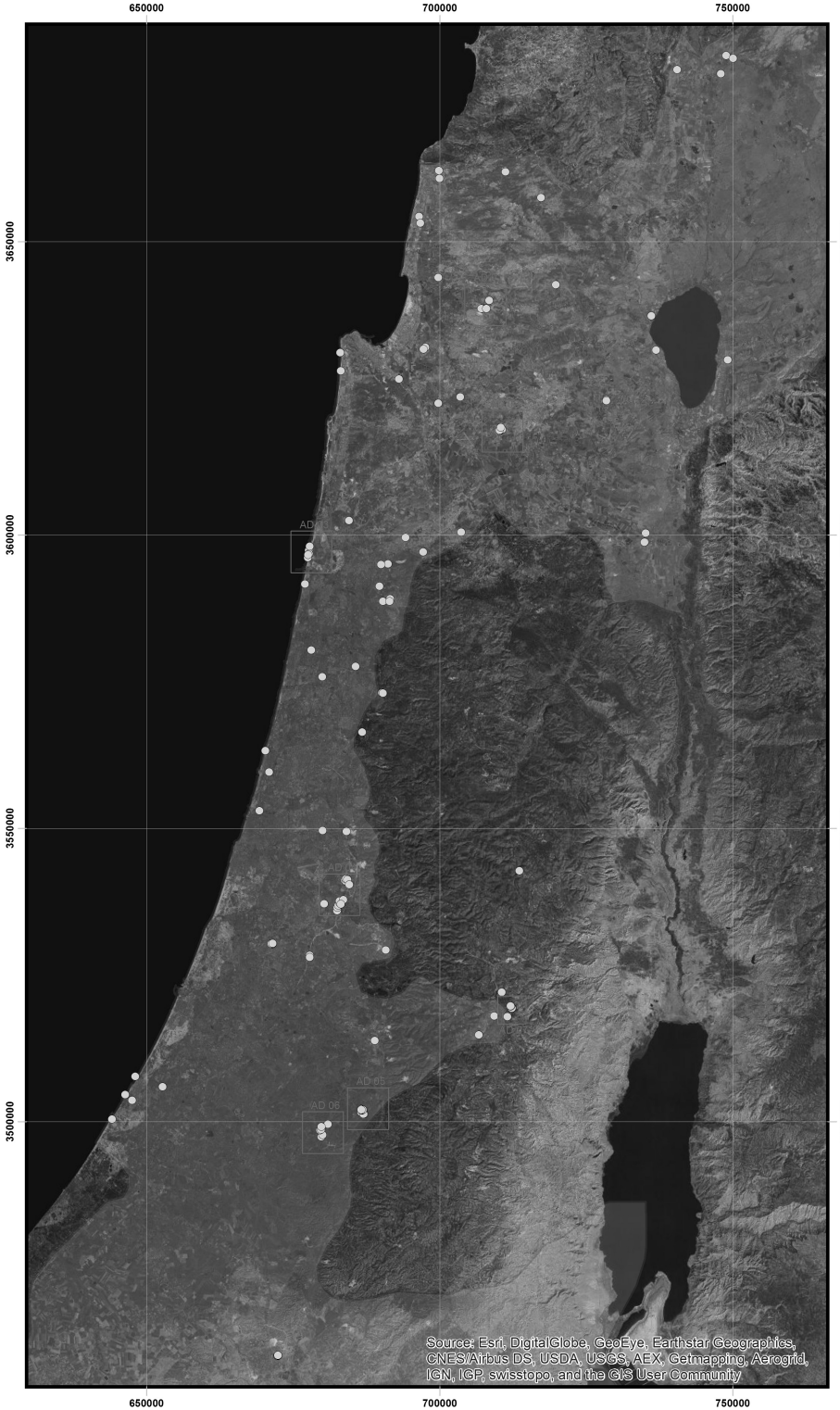
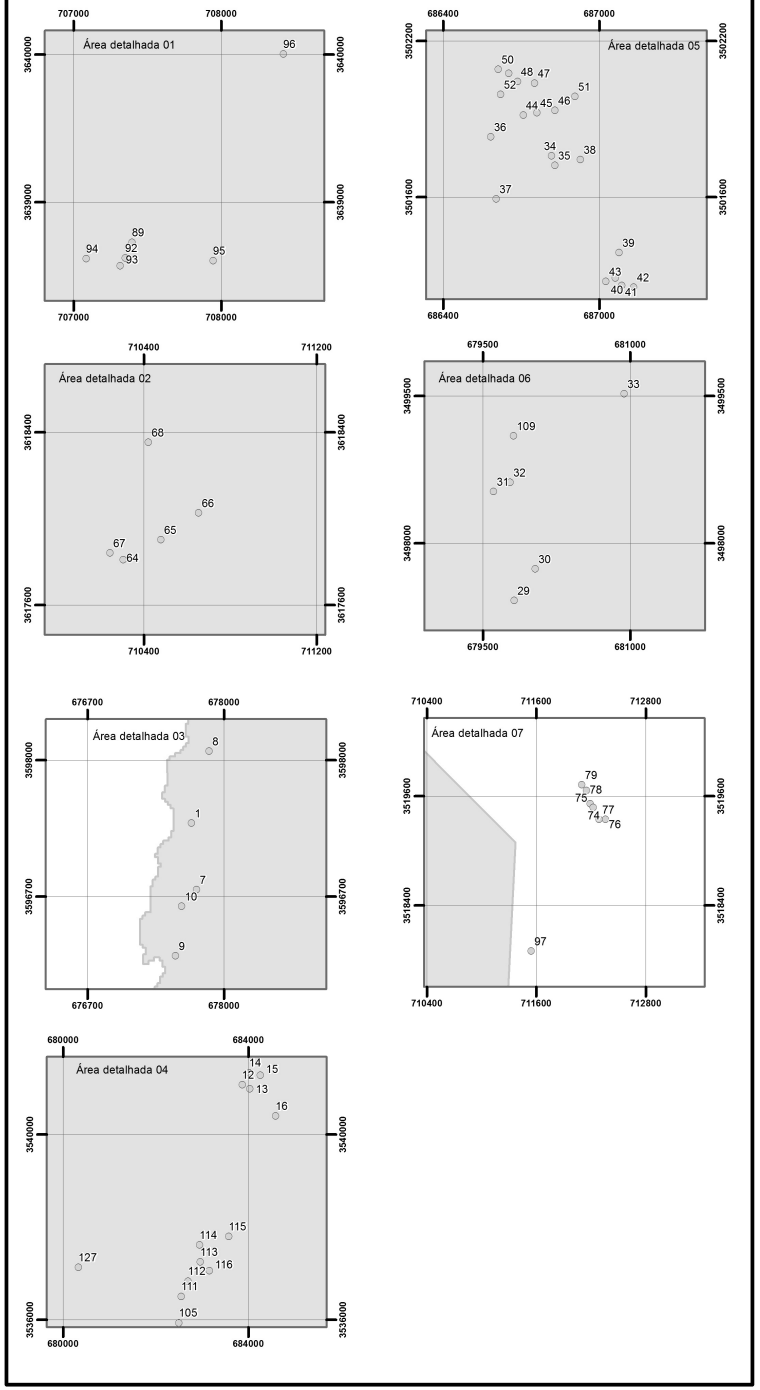
Durham University



Área detalhadas (escala)



Mapa de localização dos sítios arqueológicos do período Romano em Israel 2/2
(Localization of the arqueological interest points/places in the Roman Period in Israel 2/2)

2016

N W E S

1:844.000

0 9.300 18.600 27.900 M

Projeção: UTM Fuso: 36N
Datum: WGS84

Legenda

- Pontos de Interesse Arqueológico
- Israel

Legenda no Cartograma

- Israel
- Contexto do Norte da África e Oriente Médio

Ver "Mapa de localização dos sítios arqueológicos do período Romano em Israel 1/2" para localização do nome dos pontos.

Projeto: Análise e Distribuição Espacial de Lucernas Romanas de Disco: o caso das províncias da Palestina e do Norte da África.

Mapa Nº:	Israel	Escala:	Data:
2/2		1:844.000	2016

Equipe Técnica:

Geoprocessamento: Samuel Victor Kriger de Paiva
Coordenador: Marcio Teixeira Bastos

Realização:

USP — TEL AVIV UNIVERSITY אוניברסיטת תל אביב — Durham University

THE ARCHAEOLOGY OF LIGHT

1. Introduction

"Mas sou de vim tentar…Deixa a tinta andar um tantin no tom
até ter o dom de te encantar, tá?"
(Marechal)

This thesis addresses the multiplicity of social identities that can be evoked through material and visual culture. In relation to iconophobia in Palestine during the Roman period, clay lamps can be used to demonstrate that communities sometimes deliberately chose not to interact with particular sets of material culture, despite their availability. Clay lamps are usually located within Roman pottery studies; often related to crafts and trade in the Roman East. As such, recent studies of ceramic tableware trade have approached the subject through agent-based models (ABM) like MERCURY (Market Economy and Roman Ceramics Redistribution, after the Roman patron god of commerce) and the ICRATES project 'Inventory of Crafts and Trade in the Roman East'1. These approaches have opened new avenues in the study of networks and the Roman economy (Brughans and Poblome 2016; Bes 2015; Bang 2008; Poblome 2008 and 2013; Temin 2013).

Most scholars agree that a complex mix of mechanisms working on multiple levels was responsible for differences in pottery distribution patterns. Descriptive conceptual models for explaining how Roman trade functioned have been proposed (Bes 2015), and markets in Roman Imperial times may have operated more like bazaar-style markets (Bang 2008: 4; Brughans and Poblome 2016: 398) rather than large-scale integrated entities where specialist trade was facilitated by extensive and efficient communication networks, such as today. According to this model the Roman market was a fragmentary system with low standardisation, of which traders have very limited knowledge, and was based on opportunism and speculation; as well as social networks of trust and strong communal ties. Variable consumer demands, production supplies, environmental uncertainties and transport issues made the market a challenging environment.

Bang (2008: 200–201) suggests social networks allowed the specialisation of intermediaries and inter-regional trade to take place through the integration of political and commercial spheres. He argues that even if merchants travelled far from home, the dominating tendency was for

[1] http://icrates.arts.kuleuven.be/icrates/network-analysis/webpages/icrates_mainframe.html

communities to form and be structured around native identities, especially in urban centers and larger areas of the Roman Empire. The local emergence of social networks with a preference for native connections would give rise to a supra regional distribution of goods (Bang 2008: 249-250).

Unlike Bang, however, Temin (2014: 4) believes that Roman markets were integrated and strongly interconnected over large distances. The economy of the early Roman Empire was, according to him, a market economy with parts of this economy located far from each other, although not connected as strongly as markets today, but as part of a comprehensive Mediterranean market. Clay lamps travelled with goods that crossed the entire Roman Empire and many local industries seem to have been created in the provinces.

The study of Roman clay lamps is most commonly used in the context of religion, and politics are also involved in the complex ritualised forms of religious communication that often spur religious change (Chaniotis 2009). The Roman imperial cult as a set of rituals designed to integrate the emperor within the local pantheon and to foster provincial loyalty has been the interpretative key to explaining the change from the traditional ideal of equality of all citizens and the new imperial quality of distance and elevation (Price 1981; Flaig 2003, Silva 2015).

The Roman emperor Constantine played an important role transforming the Church from a victim of persecution into an integral part of the Roman establishment. Constantine set Christianity on a course of increasing Romanization. The incorporation of various traits of Roman religion into the Church was carried out by the new converts who were only partially integrated within the State. The result was the transformation of Christianity into a new syncretism with Roman paganism. A testament to the Romans willingness to incorporate people of diverse cultures into their empire is the fact the none of the three Roman citizens that saved Christianity from destruction was ethnically Roman—Paul was a Jew, Constantine a Serb, and Augustine a Berber (see Richard 2010: 223, 252-282).

Romans were ready to add a new god to their pantheon, including a Jewish one, like the Near Easterners, they did not believe that the gods were omniscient, and they cared mainly about subject peoples' inner beliefs, demanding outward signs of fidelity. During the late imperial period a shared belief in the immortality of the soul can be attested in Christians, Stoics, and Neoplatonists (as well as the followers of the Persian Mithras and the Egyptian Isis). By the second century even followers of traditional Greco-Roman religion had come to believe that the gods were nothing more than the mediating spirits of a universal organizing principle.

The Greek and Hebrew ideas were modified and transmitted by the pragmatic of Romans throughout western Europe. The Judaic paradox of a God whose omniscience and omnipotence placed Him far above humans but whose immense love for humans brought Him emotionally close to them, would not have gained a hearing in most of the West if it were not for Romans. Furthermore without the Roman masses to proselytize, Christianity might not have survived. The emperors also patronized the Greek philosophers and scientists whose ideas provided some of the intellectual foundations of the medieval West (Richard 2010: 250).

In the chapters that follow, I will summarize the lychnological studies and try to demonstrate an integrated approach to the study of Roman clay lamps in terms of fabric descriptions in order to address the main subjects summarized above.

2. Literature Review: Oil lamps as paradigms of Roman ceramics studies.

Lucernam olere!

Fig. 1. Roman Empire provinces and their interconnecting pathways[2].

In the past, the study of Roman oil lamps recovered from archaeological excavations has been limited to excavation publications, with a particular focus on form and decoration to develop typologies and chronological patterns. However, little has been done to move beyond this and to understand lamps in terms of their production, religious and technological significance. More recently, new approaches are developing to help us understand the nature of the lamp trade with efforts to untangle the relationship between workshops and regional centres through fabric analysis

[2] Veja as seguintes plataformas de dados abaixo para informações sobre as distâncias percorridas através das vias e rotas de navegação no Império Romano:
http://orbis.stanford.edu/;
http://darmc.harvard.edu/icb/icb.do?keyword=k40248&pageid=icb.page188868;
http://pelagios.org/maps/greco-roman/

and its implications for furthering our understanding of the Roman economy (e.g. Lapp 1997; Adan-Bayewitz et al 2008). Broader contextual questions, such as queries about lamp distribution within archaeological sites, the relationships between pottery lamps and other lightening devices and materials, the use of lamps in religious ritual, and art-historical significance and performance, have opened up new research possibilities on their use (Eckardt 2002; Rosssiter, 2009; MAIS REFS). This chapter will emphasise the intellectual history, social and cultural paradigms and archaeological practices of this field of research. The bibliographical references are discussed geographically and follow a comparative approach looking at the West and the East. The idea is to provide an overview of light equipment and their contextual interpretation in these two parts of the Roman Empire, noting some similarities in the role of votive oil lamps.

2.1. Western studies.

Initial investigations of oil lamps from the western Roman Empire (Fischbach 1896; Fink 1900; Ritterling 1912; Loeschcke 1919: 4447-451) such as Germania Magna (Superior and Inferior) and Pannonia (Superior and Inferior) were used to establish the first chronologies and typologies for this part of the Empire. Clay oil lamps were divided by Loeschke (1919) into three main categories; Bildlampen, Firmalampen and Talglampen based on their form, decoration, and name stamp. Loeschcke (1919: 249-254) further developed this first step by taking these features in order to understand the origin and place of production of clay lamps to determine the location of possible workshops. Loeschcke's work "*Lampen aus Vindonissa*" remains an important general reference for the study of oil lamps in the western Roman Empire. Roman terracotta lamps that are not 'Firmalampen' are often categorized as 'Bildlampen', i.e. figured lamps. Unfortunately, no attempt to give a fuller and more logical sense to the term 'Firmalampen' has been made, and the term 'Bildlampen' does not represent the many types of clay lamps, other than Loeschcke IX and X, that also have makers' names and figurative patterns.

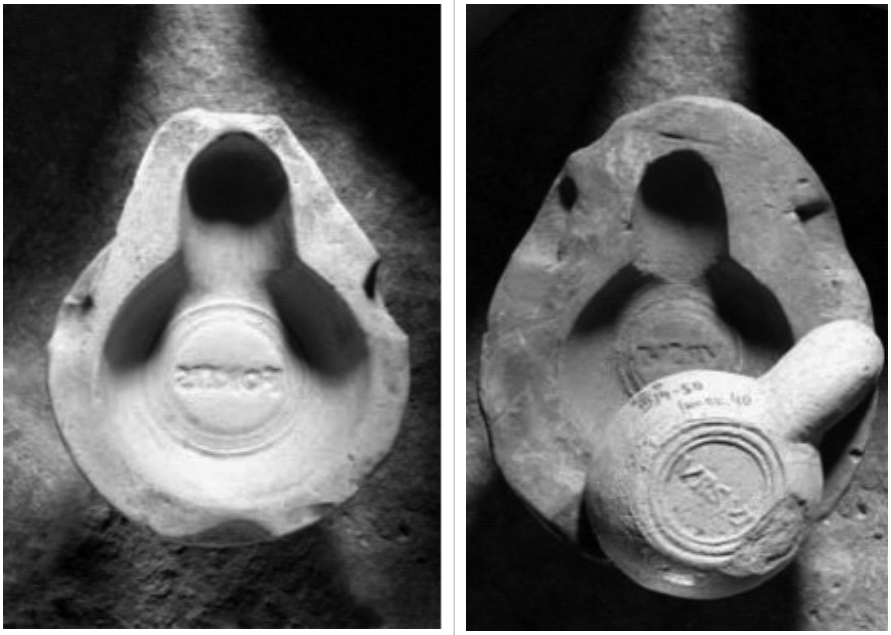


Fig. 2. Firmalampen - no decoration in the central part of the object - and signature pottery workshop.

Iványi (1935) used coins found in Pannonia to provide an initial date range for oil lamps, however, this dating evidence was not always widely accepted. Nevertheless, this study was able to determine the main types of oil lamps found in Pannonia. In addition, Juhász (1936) made a solid attempt to trace importations of 'sigillata' into the north-eastern area of Pannonia and many moulds of local manufacture were found in the region. In the case of the Italian production called ‘Firmalampen’ not only was the original Italic form imitated but also the name of its makers was forged on it (e.g. FORTIS). The studies of Menzel (1954), Szentléleky (1959; 1969), Heres (1972) and Leibundgut (1977) should be mentioned because of their efforts to create chronologies and typologies, but it is beyond the scope of this chapter to discus these in detail here. Although it is worth noting the point (cf. Leibundgut 1977: 192-194) that decorative motifs on lamps were particularly influenced by official imperial art, more closely than any other ceramic product. Furthermore, these typologies demonstrated that oriental deities were portrayed on lamps only from the end of the 1st century CE onwards.

Fig. 3. Mold for manufacturing Roman oil-lamps.

Previous to Loeschcke's (1919) typology, which is the most used and widespread reference in north-western provinces, is Dressel's study. He was dealing with the *Instrumentum Domesticum* from Rome in the *Corpus Inscriptionum Latinarum XV* (1899: 782-870) and was a pioneer in the development of systematic research and a typology of terracotta oil lamps. Dressel's work on inscriptions and name stamps remains a useful tool, but his classifications of thirty-one types are essentially outdated. The typologies of Dressel and Walters are sometimes cited, but Loeschcke's system is the standard one. Loeschcke typology is not, however, comprehensive, and other classifications have been devised, notably by Broneer, Iványi, Ponsich, and Deneauve. Provoost (1970; 1976) made further typology classifications of Italian lamps. These were followed by studies on Italy, in particular by Bisi Ingrassia (1977) and Cerulli (1977) whose important work was based on samples from Herculaneum and Pompeii and their respective workshops. Pavolini's studies (1977; 1992), contain data and fabric analysis on the lamps presents at the *Museo Nazionale di Napoli*. Ceci and Schneider (1994) used X-Ray Fluorescence (XRF) analysis on firmalampen lamps from Italy. These most recent projects have shown that a careful typological classification combined with archaeometrical analysis of clays has the potential to shed new light on the production sites of oil lamps and pottery assemblages.

The publication of the outstanding collection of lamps at the British Museum by Bailey was an important landmark in lamp studies. Although Walters's study (1914) was pioneering with regards to British lamp collections, the later examination by Bailey, who published (1975; 1980; 1988 and 1996) four volumes about those oil lamps, was superior. Lamps held a particular

fascination as symbols of learning and enlightenment in British archaeology in the nineteenth century though many of the oil lamps in the British collection are of unknown provenance and thus difficult to study. Happily, Wheeler (1930) and May (1930) published two catalogues from Romano-British centers (London and Colchester) using oil lamps from secure archaeological contexts. More renctly, Eckardt (2002)[3] combined contextual analysis, excavated sites, and the examination of the collections of the main museums in Britain to provide accurate data about the lighting industry in the Roman Period. Furthermore, the large data set enabled studies about identity, consumption and trade to be carriedout, as well as the agency of the people who used the lamps.

Looking to Gallia Province (Aquitania and Lugdunense), Deonna (1927), Brun and Cagniere (1937), and Brentchaloff (1972) re-examined the oil lamps from the *Musée Calvet d'Avignon* and the *Musée de Clermont collection,* and they were able to bring together a large dataset and to make new conclusions with respect to the chronology and origin of the lamps. However, museum collections can be problematic because only the complete and attractive examples are kept, so it is difficult to widen our understanding of the economic or social context. Nevertheless, lamps found southeast of Gaul in the sanctuaries of *Chastellard de Lardiers*[4] and *Lachau*[5] as well as *Alba-la-Romaine* (Ardèche)[6] (Ayala 1990:153-212) raised questions about the role of lamps as votive objects. In Lachau (sanctuary of Luminaire) a local workshop supplied clay oil lamps to the votive place (c.f. Leglay 1971:430; 1973:534-535; Bleu 2003: 497-512) and in Chastellard de Lardies various types of oil lamps were found in the *favissa* (crypt or cellar), which demonstrated social differences in consumption practices between the devotees (c.f Rolland 1962: 655-656; 1964:545-550).

The studies of Vertet (1983), Bémont and Bonnet 1984; Bonnet 1985) focused on techniques of production and potter's marks found in Gallia. They observed a change in the trade flow and scale of complexity between the 2nd and 3rd centuries CE, especially in relation to local productions copying imported oil lamps. Recently Cueillens (2000: 177-188) and Bémont (2002) have published the lamps from Bourdeaux and Glanum, increasing our knowledge about the circulation of oil lamps in Gallia. Rivet's study (2003:233-257) demonstrated that even when there

[3] 1500 lamps were analyzed

[4] Nearly 3000 lamps were found.

[5] 3000 lamps were found.

[6] 156 lamps.

is no evidence for kilns or moulds, the presence of a workshop can be suggested on the basis of an abundance of oil lamps and wasters of the same origins found within the same region.

In regions such as Tarraconense, Bética and Lusitânia the manufacture of oil lamps reached high level and these lamps can be found in other provinces of the Empire. Lusitânia has the lamp collections from the *Museu Emeritense* published by Gil Farrés (1947; 1947-8) and more systematic studies on the subject have been published by Almeida (1952) and Oleiro (1952). Almeida makes an inventory of all clay oil lamps that were in Portuguese museums at that period with a particular focus on conveying a chronological and morphological evolution of oil lamps; whilst Oleiro organizes the collection from *Machado de Castro Museum in Coimbra* presenting it chronologically. Castro (1960: 281-299) analysed lamps from mining contexts, and he made some interesting observations about the large size of the lamps for holding more oil to increase the length of time the miners could work. Castro's study was the first to focus on a specific set of lamps, unlike most general regional studies. Alarcão and Ponte (1976) provided a more robust chronology and typology for the samples found in Lusitânia and their work became a useful reference. In recent years in Portugal new studies, such as those by Maia and Maia (1997), Caetano (2001), Pereira (2008) and Viera (2011) have followed new approaches on the topic and need to be mentioned.

Votive lamps have also been recorded in Lusitania on the sites of Horta das Faias (Peroguarda), Horta do Pinto (Faro), and Santa Bárbara de Padrões (Castro Verde), which yielded thousands of lamps from a votive *favissa* context. In particular lamps from Santa Bárbara de Padrões and Horta das Faias were used before being thrown into the *favissa*, as proved by their soot-blackened wickholes, which suggests that the devotees involved in the ritual ignited their lamps before offering them into the pit (Calado 2012:127). Therefore, the use of light in Lusitania was not only for functional reasons (eg mining and domestic use) but also for public rituals. The fact that some lamps were found intentionally broken is particularly interesting (Maia and Maia 1997: 21-23; Viana and Ribeiro 1957: 19-20); the act of breaking votive objects appears to play an important role in religious rituals throughout the Roman Empire between the first to second centuries CE[7].

Roman society was multi-religious and multicultural (Woolf 1995; 1997; 2009), and rituals among certain social groups or in a particular part of the Empire were not necessarily identical.

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Alvarez-Ossorio (1942), Palol (1948-49), Chicarro (1952-53), and Lambolgia and Béltran (1952) were the very first scholars to publish oil lamps from Tarraconense and Bética. The lamps from the *Museo Arqueológico Nacional*, *Museo Arqueológico de Barcelona* and *Museo de Sevilla* followed a typological and chronological framework and raised questions about whether certain motifs were preferred at certain times or in certain areas. Balil (1965; 1968; 169; 182) provided a series of papers discussing a few methodological issues and signed lamps found in Spain; whilst Amaré Tafalla (1984; 1987; 1988; 1989) developed this subject further. She pointed out that a study which attempts to make a full collection of existing scenes in oil lamps through the Empire has not yet been done. A good example of efforts to piece together the several typologies and classifications used to analyze oil lamps in distinct regions of the Roman Empire was developed by Morillo Cerdán (1990:143-167). Morillo Cerdán (1992; 1993) also published lamps from the military camp of Herrera de Pisuerga. Military sites could produce their own lamps and the amount of samples from Legionary fortresses often differs from auxiliary forts due to the degree of "*Romanitas*" and power. Recently, Betriu (2008) studying the lamps from Badalona[8] concentrated his efforts on a comparative review of typological and chronological studies, providing more data on the types, signature mark's pottery and decorative motifs in circulation in that region.

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Museums of Algeria and Tunisia. Doumergue (1932) also followed stylistic attributes to organize the catalogue of lamps from the Museum of Oran in Algeria and to provide a chronological order. Indeed, the majority of catalogues of lamps from Museums had a strong emphasis on typology with the implicit aim of developing a chronological framework that could be used as a guide. This is a direct reflection of the link between lychnological studies and pottery studies of the period. However, lychnological studies slowly became more independent. Lamp studies increasingly looked at production, distribution, trade, functional aspects, as well as the social context of consumption and relationships with social groups. Ponish's (1961) study of lamps found in Mauretania Tingitana analysed the museum collections of the *Musée L. Chatelain de Rabat*[9], the *Michaux-Bellaire de Tanger* and the *Musée de Tétouan,* which housed lamps from the sites of Volubilis, Banasa, Thamusida, Mogador, Sala, Tamuda, Tanger and Lixus. In particular for the last four sites, the lamps came from funerary contexts. The rigorous typology created from these lamps, offers a good basis for the understanding of the development of the light industry in modern Morocco.

Reyniers (1965) studied the lamps[10] from Tunis, Thigibba (Hamman ez Zouakra) and Uthina (Oudna). The cemetery located in Thigibba confirmed the custom of burying the dead with one or two lamps (the same phenomenon can be noted in Palestine). Lamps displaying Christian symbols from inside the Thermes of Uthina appeared intimately mixed with Roman "picture" lamps (round discus class) "broken into a thousand pieces" (Reyniers 1965: 232-234). It was suggested that this destructive act was carried out later (5th century CE), probably during one of the indigenous uprisings that devastated the region.

Deneauve published a series of relevant studies (1969; 1972; 1974; 1986; 1987) about lamp production in Africa Proconsularis. One of these looked at the underwater archaeological site located at the foot of the cliffs of Port-Miou, Cassis, showing evidence for lamp trade[11] (early Christian types) associated with other kinds of pottery that crossed the Mediterranean. The shipwreck of Gerbal (Port-Vendres) and Port-Miou substantially support this idea of Mediterranean trade (Deneauve 1972:222). Deneauve's examination (1986:141-161) of a few identical lamps bearing different potters' marks provided extra information about how moulds produced with Italian coroplasts had spread during the 2nd century CE into newly created workshops in North Africa.

[9] 500 lamps.

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Centres such as Tebourba and Sabratha seem to have played an important role in the distribution due their location on the coast, and the sites of Sidi Aïch and Henchir es Srira are major pottery centres near to the coast, and their goods were presumably transported to these ports for trading. Recently, Mackensen and Schneider's (2002; 2006) have provided support to Deneauve's hypothesis, and the discovery of production centers at Sidi Marzouk Tounsi, el-Mahrine, Henchirel-Biar, Henchir el Guellal (Djilma) and Henchir es-Srira, through survey and physic-chemical analysis show an increase in pottery production in North Africa during the 3rd century CE.

Fig. 4. Oil lamps from North Africa with Christian symbols and others iconographic repertoires, Balbi Crypt Museum, Rome.

The studies of Vertet (1983), Bémont and Bonnet (1984; Bonnet 1985) focused on techniques of production and potter's marks found in Gallia. They observed a change in the trade flow and scale of complexity between the 2nd and 3rd centuries CE, especially in relation to local productions copying imported oil lamps. Recently Cueillens (2000: 177-188) and Bémont (2002) have published the lamps from Bourdeaux and Glanum, increasing our knowledge about the circulation of oil lamps in Gallia. Rivet's study (2003:233-257) demonstrated that even when there is no evidence for kilns or moulds, the presence of a workshop can be suggested on the basis of an abundance of oil lamps and wasters of the same origins found within the same region.

In regions such as Tarraconense, Bética and Lusitânia the manufacture of oil lamps reached high levels and these lamps can be found in other provinces of the Empire. Lusitânia has the lamp collections from the *Museu Emeritense* published by Gil Farrés (1947; 1947-8) and more systematic studies on the subject have been published by Almeida (1952) and Oleiro (1952). Almeida makes an inventory of all clay oil lamps that were in Portuguese museums at that period with a particular focus on conveying a chronological and morphological evolution of oil lamps; whilst Oleiro organizes the collection from *Machado de Castro Museum in Coimbra* presenting it chronologically. Castro (1960: 281-299) analysed lamps from mining contexts, and he made some interesting observations about the large size of the lamps for holding more oil to increase the length of time the miners could work. Castro's study was the first to focus on a specific set of lamps, unlike most general regional studies. Alarcão and Ponte (1976) provided a more robust chronology and typology for the samples found in Lusitânia and their work became a useful reference. In recent years in Portugal new studies, such as those by Maia and Maia (1997), Caetano (2001), Pereira (2008) and Viera (2011) have followed new approaches on the topic and need to be mentioned.

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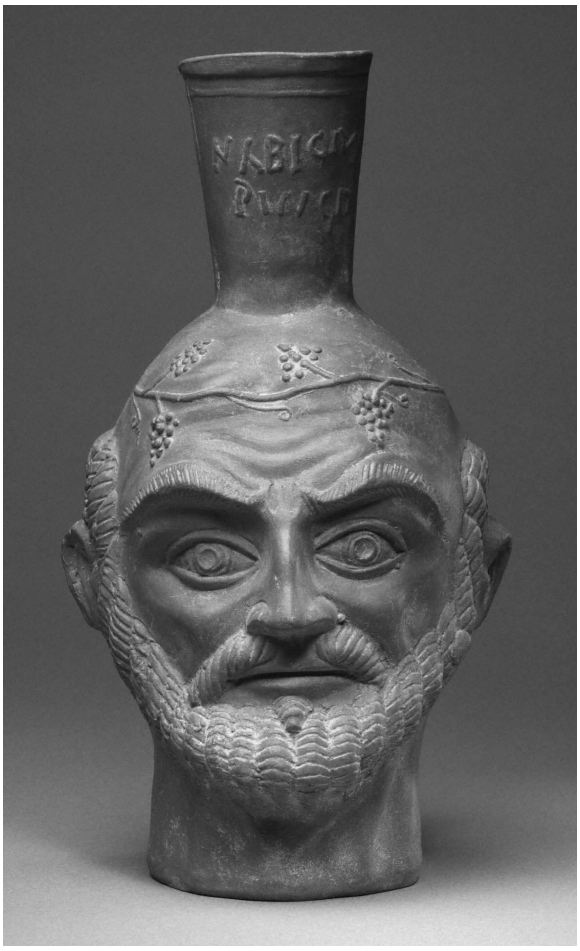

Fig. 5. Vessel with pottery signature of Navigius, ca. 270-320 EC (Princeton Art Museum)[17].

In terms of pottery trade, John Hayes (1972) created the first comprehensive typology of Roman African pottery that was trade in the Mediterranean, and then in the publication 'Atlante delle forme ceramiche' Pavolini (1980)[18] created a typology of lamps in African red slip, that mainly came from Carthage, and then in a further publication (1983) started to approach statistics on the diffusion of lamps from Tunisia throughout the Mediterranean. The site of Bordj Djedid

[17] http://artmuseum.princeton.edu/collections/objects/33263?qt-object_data=3

[18] Pavolini, C. 1980, Le lucerne in Terra Sigillata Africana da esportazione: proposte di una tipologia, in Actes du Colloque sur la Céramique Antique, Carthage, 23-24 juin 1980, Carthage 1982, pp 141-156.

(Carthage) offers a glimpse of the lamps[19] in use during the 3rd century CE in the region. The lamps were associated with terracotta statues and moulds (with a poor state of conversation), which appear to have come from different centres (Deneauve 1986: 159-163). So the moulds were used in secondary workshops, meaning that a single mold could produce lamps for at least three generations (with or without decorative adaptions). In Bordj Djedid the subjects used to decorate lamps were closely related to Navigius vases (Deneauve 1986: 160-161), and were high quality products, particularly during 3rd century CE. and point out to the Phoenician trading city in North Africa capital of defeated Carthaginian Empire. It would not be an exaggeration to claim that the Roman clay oil lamps were used as media, exactly as coins, statuary, and clay figurines.

The religious iconography of North Africa is interesting because it information that helps us interpret decorations on some lamps. Deneauve (1987) analysed a group of figurines with remarkable technical quality and diversity of mythological domestic decorative motifs (e.g. domestic scenes, feasts, animals). Some of these figurines were originally displayed on lamps and others were transformed into lamps by the piercing of holes. The association of lamps and figurines is common in mortuary contexts. Lamps were often placed in tombs accompanied by figures, which clearly had votive roles. Some subjects seem to have been directly inspired by the mortuary iconography. The scene displayed on lamps with a feminine hairstyle is known in Roman times from bas-reliefs that decorated tombs from 3rd century CE (Deneauve 1987: 201-202). This is known as Augustan programmatic art[20] and demonstrates the combined association of images from clay lamps, derived from mosaic floors, wall paintings and coins. The reproductions of famous sculpture types with parallels on coins and clay lamps illustrate the traditional Roman values, at the same time as providing information on how imperial power operated media and propaganda in Antiquity. This kind of association can be seen in North Africa through the production of commemorative lamps (New Year celebration), which have a similar decorative patter with the coins minted for the some purpose (cf. Hellman 1987: 33-36).

Bohec (1981) has grouped epigraphic evidence and lamps with inscriptions, relating those lamps with the presence of Jews in North Africa. Clay lamps from the 2nd and 3rd centuries CE were discovered at the necropolis of Gammart in association with the menorah symbol, suggesting the presence of a Jewish cemetery in Carthage (Bohec 1981:168). In Cherchel and Tipasa, Bussière

[19] About 340 lamps.

[20] See Leibundgut 1977: 196-201; Amaré Tafalla 1986; Hafner 1949; Eckardt 2002:117-129.

(1992:188-195) located lamp workshops (e.g. *Assenes*) suggesting that most of the assemblage under analysis was linked to a well-known and thriving workshop from that time. The estimate of one hundred moulds making two hundred clay lamps before the moulds were thrown away, provides information about lamp production techniques in Roman times supporting the assumption that every time a mould was used the vessel became (10% on average) smaller, because the re-use of the mould and the firing process, which is what reduced its size.

Fig. 6. Manufacturing process of clay lamps

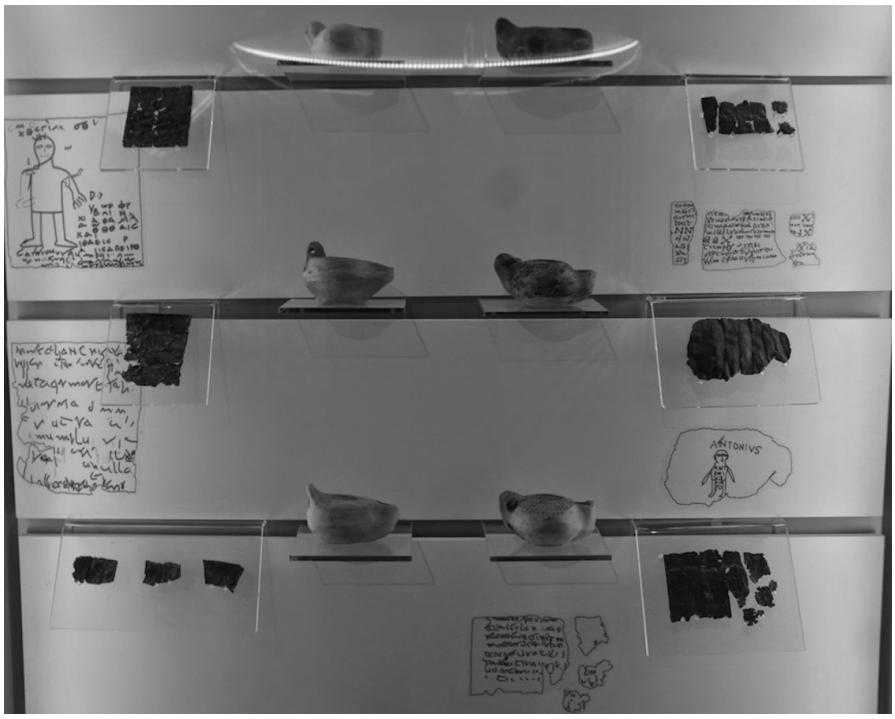

Fig. 7. Clay votive lamps with coins and defixiones from the Fountain of Anna Perenna, Museo Nazionale Roman, Baths of Diocletian, Rome.

2.2. Eastern Studies.

In the eastern part of the Roman Empire, Basset (1903) examined lamps[21] from the Vari Cave (Nympholyptos Cave), in Attica. The cave was dated from the sixth to second century BCE, and it fell into disuse until it was occupied again in the 4th century CE, only to be abandoned completely sometime in the sixth century CE. The site is situated about three hundred metres above sea level and near the top of one of the southern spurs of Mount Hymettus, which has shrines dedicated to Pan, Apollo Hersus, the Nymphs, and Graces. On the disks of the lamps, the divinities depicted include Artemis with her hound, Athena (with helmet, shield and spear), Isis, Eros playing Pan's pipes and Pan. Approximately two hundred lamps were found depicting either a rosette made of six to twenty petals, or a shell, very common themes portrayed in these sort of round Roman round lamps (Basset 1903:343-345). Evidence for a later Christian occupation could be proved by the recovery of a small iron seal-ring bearing the image of a cross and a large number of lamps from

[21] Nearly 1000 lamps.

the fourth to fifth century CE; some of them stamped with the chrismon. There is every indication that Christians intentionally mutilated the reliefs represented in the interior of the cave. This seems to point to major upheavals within society with the rise of Christianity's power and the church as State. A discourse of image destruction and the erasing of memory, just after Augustus, at the time of the Principate, the so-called second "image war", is considered as an internal development from Eastern Christianity, a period when the image as object-to-think was a powerful discursive and polemical weapon without any precedent in Western tradition (Elster 2012: 370-377). Christians smashed sculptures, and an attempt to draw a cross on the right hand fingers of the image of a stonecutter (Archedemus[22]) was made. Archemus is known through the tools of his craft and the incisions were attested by the excavator. Further, the votive offerings, the terracottas, the vases and the lamps were found in a small damp room, suggesting the cave was intentionally covered with earth after Christian occupation (Weller 1903:285).

Beyond the lamps from Vari cave, artefacts from Delos, Phyle, Mt. Parnes (cave of Pan), Knidos, Ephesus and Priene were published between 1900 and 1908[23]. Lamp production centres have been identified in Corinth, Athens and Argos. Bronner (1930) grouped thirty-seven types of lamps[24] from the excavations at Corinth with the aim to provide data for the study of ancient ceramic lighting equipment at Greek sites. He was able to demonstrate that lamps although differing widely in appearance, can actually be contemporary and produced by the same manufacturer (Bronner 1930:20). Bronner also claims to have created a general 'Corpus of Ancient Clay Lamps', but there are still many gaps waiting to be filled.

Thompson (1933) was the first scholar to publish lamps from the excavations in the Athenian Agora, but Perlzweig (1961) studied the lamps within their archaeological context (1931-1956)[25] to create a flexible reference system that could be used at all sites in Greece. The study took into account imported lamps found at Athens and the local productions from Corinth and Attica. As a result of this, towards to the end of the 2nd century CE the Athenian products had close similarities to the Corinthian lamps. Later, from the 3rd century onwards Athens developed local workshops producing original models. At that point, Corinthian workshops began to copy the Attic

[22] The word *Archedemus* appears twice, cut into the background of the man's face in low relief, possibly referring to his name (Weller 1903:272).

[23] See (Bronner 1927:333) for more details.

[24] 1560 lamps catalogued, and 2500 more lamps have been found at Corinth (see Perlzweig 1961: 6)

[25] 2950 lamps from 1st to 7th centuries CE.

lamp-makers' products. From the late 4th and early 5th century Attic workshops started to imitate products from Asia Minor (Ephesos, Miletos) and North Africa (Perlzweig 1961: 9-11). This indicates how competitive local trade had become and suggests the strong influence of major centers of production on all clay lamp production sites .

At Gymmasium, north of Corinth, a votive lamp deposit was found. The remains are known as the "Fountain of the Lamps", and are part of a larger fountain-bath complex, re-used in the Late Roman period as a cult room and repository for thousands of clay lamps[26]. The significant size of the assemblage necessitated a re-examination of Late Roman lamp production lamps at Corinth with the aim to refine the chronology of the site (Garnett 1975:174). The lamps found displayed relief disks mixed with both Christian and Polytheist symbols. However, the presence of Christian oil lamps does not necessarily imply the site was Christian. It should be noted that elsewhere in the Roman Empire Pagans probably used Christian clay lamps when traditional ones were not available, or when Christianity became State. Further, the presence of clay lamps with Christian or Jewish symbols does not imply the site was Christian or Jewish.

Based on the analysis of four inscribed lamps, Wiseman (1972: 26-33) suggested that the large underground bath complex was a place of magic incantation related to possible mixed cults that include angels and water, natural grotto deities (e.g. Pan, nymphs), and Eros in connection with Christian and Jews. A critical review by Jordan (1994: 223-229) disregarded Wiseman's interpretation, saying that many of the drawings of the inscriptions in Greek found on lamps were incorrectly interpreted. He proposed new readings and suggested that the place could have served Christians as a site for the cult of angels who healed the sick through the waters (227), as well as using them for baptisms (228). In the end, it is not possible to be sure about the Christian use of the bath complex. Furthermore, the contextual analysis of the site supports other possibilities such as mixed cults between Jews, Christians and Pagans (see Wiseman 1972:1-42). The plurality of ritual practices and mixed identities in Late Antiquity allowed for interaction between religious groups as elements that were being negotiated and selected according to the social group's interests; this re-negotiation of power created distinctive interactions between people and places.

Evidence suggests that lamp replicas from North African produced between the 4th to 6th century CE were the second most abundant type found in the Fountain of the Lamps. North African lamps appear to be reproduced by the Corinthian workshops with a variety of motifs and treatments

[26] Nearly 4000 lamps.

that suggest these lamps were reproduced not only in Corinth but in a number of different cities. Bonifay's studies (2004; Bonifay et al 2012) using petrology and geochemical methods brought new approaches to studies of African Red Slip ware and production centres in North African. Central Tunisian oil lamps were imported on a large scale until the end of the 5th to the early 6th centuries CE (Bonifay 2013: 554), and regional and local ceramic products were traded at major settlements and towns located along the main roman roads. Rossiter (1988) provides a significant contribution with the study of lamps from a cemetery at Carthage, and Mackensen (2002; 2004 and 2006) provides information about the manufacturing process of clay lamps in North Africa and location of pottery workshops.

Another Roman Bath with a large open deposit of lamps (dated to the early decades of the 5th century CE) was found in the Corinthian Isthmus located approximately 100 metres north of the temple of Poseidon, a sanctuary built in the 2nd century CE, and its end coincides with the moment in which it became a source for building materials for the construction of the Hexamilion. Wohl (1981) published the lamps and noted striking parallels between the Roman Bath deposit at Isthmia and the Fountain of the lamps. The lamps were mainly decorated with non-figurative images and were glazed, a late development of Athenian manufacture. The exception was the figure of a rosette, constantly repeated in combination with a herringbone rim decorative pattern (Wohl 1981:138).

In the sanctuary of Demeter and Kore (Slane 1990) the lamps[27] displayed reliefs of goddesses (e.g. bust of Athena in high relief) and female mythological subjects, and Demeter and Hermes and the ram can be identified as well as other erotic symplegma. The predominance of female subjects in lamps from the 2nd and 3rd centuries CE suggests a bias towards the female divinity. Some of the lamps had signatures from well-attested workshops (e.g. Oktabios, Posphoros, Olympianos) with a few writing mistakes: using the wrong letter was a common mistake on lamps from the 3rd century CE and may be connected to new illiteracy among lamp-makers of the period in the region (Slane 1990: 14).

Still in Greece, Oikonomou (1988) published the paleo-christian lamps from Argos, whilst Gill and Hedgecock (1992) draw on some of the main workshops operating in the 3rd and 4th centuries CE[28] in Achaia Province. Recently, Koutoussaki (2008) studied the lamps of the

[27] 62 lamps were found and analysed

[28] Different workshops operating in Athens: Elpidephoros; Eutyches; Ky-; Leonteus; Pireithos; Polykarpos; Preimos; Stratolaos; Zosimos (Gill and Hedgecock 1992: 421).

excavations (1972-1991) in Argos with a broad perspective, producing statistical data[29] for the local productions.

Bonnet's study (1981) should also be mentioned among those with signed lamps (from Alexandria, Fayoum, Cyprus and Ephesus) in the East. The systematic analysis of signatures, form and design was carried out to check whether there were relationships between these elements. Regions such as Syrian and Lebanon still have an incomplete and fragmented picture of their lamp industries because so few studies have been developed in these areas. Dobbins (1977) carried out a study at Syria, looking a lamps from several sites (dated archaeological deposits) to establish a typological and chronological framework and to identify centres of manufacture.

The analysis of excavated lamps from Antioch, Dura Europos and Dibisi Faraj served to demonstrate a relationship between lamps from Antioch and Dura Europos from the 2nd to 3rd century CE, which were mainly inspired by Antiochene workshop designs. The connections between Antioch and Dura Europos during this period contribute to the transformation of the Roman discus lamp[30] into local form - Durene style (Dobbins 1977: 156). In the 3rd and early 4th century a red-slipped tradition developed at Antioch, possibly influenced by Athens (p. 157). The unslipped production was related more with Euphrates Valley sites and drew its influence from 2nd and 3rd century CE Syrian disk (round) lamps. Dobbins (1977: 158) still noted that from the 4th to 7th centuries CE stylization of decoration took place and the red-slipped tradition ended with the Arab conquest; whilst the unslipped lamps continued into the Omayyad period.

In Transjordanian four moulded lamps were recovered in the hippodrome at Gerasa: none of them exhibit any traces of use, suggesting an association with a ceremonial act at the beginning of the building's construction, such as foundation offerings. In it is noteworthy that representations of menorahs appear on the nozzles of clay lamps, suggesting Jewish clientele (Lapp 1997: 200-203).

The Lebanese lamps recovered in the excavations at Beirut (site 006 BEY)[31] were studied by Mikati (1998), who has shown that lamps from the Roman Period were mostly from the round discus group, which came from an over-moulded process. The evidence suggests that the market was saturated with this production, being a popular and easily accessible product. It is possible that

[29] 5518 lamps were analysed by Koutoussaki.

[30] The Lamp deposit in Bath E is helpful for understanding the final phases of disk lamps in Syria, see Dobbins 1977: 62-70.

[31] 2500 lamps analysed.

the discus lamps were produced in large quantities just to monopolize the local market and thus the centres of regional or local production played a key role in the production of imitations.

The decorative iconography found in Beirut suggests that local workshops were incorporated into the Roman cultural process and sought to express this through their own resources. The analysis of the clay from those lamps points to origins in the region of Tyre and/or North of Israel. Differences in styles of signatures suggest that the lamps were made by different potters, or originate from different workshops (Mikati 2003 : 176).

Ilife (1934) and Day (1942) represents the first studies of oil lamps from the Province of Judaea. Lamps in a funerary contexts such as those from tomb El Bassa[32] (especially in caves) were found in abundance throughout Israel[33] and their connection with ethnicity has been accepted as an expression of religious beliefs. Brand (1953: 352–361; see also 1969: 40) noted that Roman discus lamps from Palestine[34] were intentionally broken. He aimed at identifying pottery in talmudic terms and asserted that the break in the central part of the lamp was a Jewish custom—a ritual of cleansing. Kahane (1961: 129, 142–143) reinforced this hypothesis with the publication of lamps from tombs at Ḥuqoq (Upper Galilee) side by side with crude local ossuaries, which he dated to the second half of the 1st century CE and ascribed to Jews. Neidinger (1982: 160) expanded the idea of intentional breaking of discus lamps as "such images being offensive to orthodox Jews and probably Christians as well". He mentioned that Rabbi Eliezer ben Hyrcanus (fl ca. 100–130 CE) "tried to discourage the use of lamps with images by stipulating that the filling hole must be large enough to let a coin pass through (Kelim 32). Since no coin was so small, it was incumbent upon

[32] 15 lamps were found.

[33] Discus lamps are well documented in many excavations, e.g., Sellers, Baramki and Albright (1953: Fig. 9, Fig.35) (Mugharet Abu Halimeh, Nablus); Negev (1971: Fig. 27: D) (Kurnub, Negev Desert); Gophna and Sussman (1974: Fig. 4:9) (Tel Halif, Galilee); Prausnitz and Rahmani (1977: 311, Fig. 3) (Kfar Baruch, Jezreel); Zias (1980: 64, Fig. 4: 6) (ʻAraʻra, Naḥal ʻIron); Tzaferis and Yadin (1982: 12–14, Fig. 2: 1) (Beth Shean); Oren and Rappaport (1984: 123, 127, Figs. 14: 6; 17: 3–4, Pls. 14: A, 15: F–G) (Maresha/Beth Guvrin); Barshad (1993: 34, Fig. 31: b) (Naʻura, Galilee); Abu ʻUqsa and Najjar (1997) (Kafr Kanna, Galilee); Aviam (1997: 80, Fig. 2: 2) (Shaʻab, Galilee); Baruch (1997: 94, Fig. 4: 8) (el-Kirmil, Mt. Hebron); Gorin-Rosen (1997: 72, Fig. 2) (Kafr Yasif, Galilee); Hizmi (1997a: 87, Fig. 2: 4) (Itamar, Samaria); Hizmi (1997b: 128, Fig. 8: 1) (Shechem); Sagiv, Zissu and Avni (1998: 20*, Figs. 4, 10; 6: 11; 12: 7) (Tel Goded); Kletter and Rapuano (1998: 53, Fig. 5: 1) (Kh. Ibreiktas, Sharon); Feig (1999: 51*, Fig. 6: 3–4) (Iʻ Billin, Galilee); Tal et al. (1999: 8*, Fig. 14: 5) (Parod, Galilee); Nahshoni et al. (2002: 61, Fig. 9: 1–6) (Ḥorbat Ẓefiyya, Judean Shephelah); Aviam (2004: 71, 82, Fig. 7.19: 6) (Qeren Naftali, Galilee); Sussman (2004: Figs. 2: 3, 8, 11; 6: 1–4; 7: 4) (Ḥorbat Rimmon, Judean Shephelah); Shurkin (2004: 40*, 47*, Figs. 15: 10; 21: 2) (Jerusalem); Tatcher and Gal (2009: 14*–15*, Figs. 9: 3; 10: 4–6) (Migdal Haʻ Emeq, Galilee). Despite the selective nature of the references mentioned above, concentrations of such lamps seem to be found in the Sharon Plain (and its adjacent valleys), the Galilee (its lower and mountainous parts) and the Judean Shephelah.

[34] To have a complete review of the development of studies on oil lamps from Palestine see Teixeira Bastos (2011: 145-170).

the user to break the discus". Sussman (1983: 71), following her studies on Samaritan lamps, opposed the Jewish attribution of the intentional breaking of Roman discuses by stating that the Samaritans are considered to have been stricter in their observance of the Second Commandment than the Jews. Sussman (2004: 110*–111*) seems to change her opinion later on, on the habit of breaking the disk in discus lamps, given their frequent appearance side by side with ossuaries and their proximity to a Jewish centre, Ḥorbat Tilla, and then the lamps from the cemetery of Ḥorbat Rimmon in Judean Shephelah. Recently, Vitto (2011) tried to sustain the Jewish attribution of the intentionally broken discus lamps by mentioning the Moshe prohibition against the use of graven images (Exod 20:4–5; Avodah Zarah 3:3; endorsed by the purification rituals of the period, i.e., Betzah 4:4 and Kelim 2:8; 3:2), and claiming that such lamps are mostly found in Jewish contexts, while those with an intact discus are discovered at sites inhabited primarily by 'pagans' (2011: 51*–52*).

It is clear that intentionally broken discus lamps are found in both Jewish and Samaritan concentrations. Their appearance in Jerusalem on the one hand (cf. Hershkovitz 1987: 319, Figs. 11: 5; 13) and in Shechem, Samaria, on the other (cf. Magen 2009: 181, 217, 266, Pls. 34: 1, 5, 7; 49: 1; 57: 2–3), as well as in both Jewish (Judah) and Samaritan (Samaria) regions strongly support this claim. However, some contexts may illustrate their religious use by the presence of other (ethnic) finds providing discussions that favour a different attribution[35]. Therefore, after providing conclusive evidences that the act of intentionally breaking or mutilating pagan or pagan style (i.e. floral) motifs was a common practice shared by the three monotheistic religions of Roman Palestine: Jews, Samaritans and Christians (cf. Tal and Teixera Bastos 2012), the religious interpretation as the sole interpretation cannot do justice to this phenomenon (Tal and Teixeira Bastos 2015).

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[35] Braun, Dauphin and Hadas (1994: 111–112, Figs. 4: 10, 12; 5: 5, 9) (Sajur, Lower Galilee) - Intentionally broken discus lamps were discovered side by side with bronze bells and a signet ring with a motif of a lion; Oshri and Najjar (1997) (Ginnegar, Lower Galilee) – an other intentionally broken discus lamp was discovered with a bronze bell; Smithline (1997: 51, Figs. 7; 8: 6) (Asherat, Lower Galilee) - Broken discus lamps side by side with a signet ring with a motif of a crab; Syon (1999: 59*–60*, 68*, Fig. 5: 1) - Other such lamps were discovered in a burial cave at Mount Gilboa, which due to the discovery of a Samaritan sarcophagus and lamps was attributed by the excavator to Samaritans with an affinity for the area of Beth Shean (Scythopolis); Barshad (2004: 19, 24, Fig. 3: 5–6) (Ḥorbat Indur, Lower Galilee) - Based on the discovery of ossuary fragments and the chronologically limited period of occupation the burial cave was indirectly associated by the excavator with Jews; Nagorski (2007: 47*, Figs. 2; 3: 9, 12) (Shoham, Lower Galilee) - Intentionally broken discus lamp was discovered together with fragments of ossuaries and a bronze bell; (Haddad 2007: 49–51, 55–56, Figs. 7; 8: 4–5) (Ḥorbat Zikhrin) - Intentionally broken discus lamps were discovered together with bronze bells and a Jewish attribution was indirectly suggested. Interesting to note that Naghawi (1989: 209 and 218, Fig. 4 and Fig. 11) published a Roman Tomb from Jerash, Syria, (Late 3rd century and the early 4th century CE) with a Byzantine attribution where discus lamps with open made role were discovered together with a bronze bell and bronze spatula.

The geographical distribution of the Roman round (discus) lamp class reaches cities such as Beth Shean (Hadad 2002: Nos. 20, 22–23, 25–29), Meiron (Meyers, Strange and Meyers 1981: 151, Pl. 9.16: 1–3), Jalame (MacDonnell 1988: Nos. 7–26 passim), Dor (Rosenthal-Heginbottom 1995: 244–245, Type 26, Figs. 5.22: 3, 6–7; 5.23: 1–3) and Caearea (Sussman 2008: Nos. 46[?], 75[?]–76, 79, 83, 86–87, 89, 93–94, 101, 103[?]). Only two villas can be attested with such lamps: Apollonia (Wexler and Gilboa 1996) and ‘Ein ez-Zeituna, Naḥal ‘Iron (Glick 2006: 56–58, Fig. 12: 1–4).

The majority of lamp studies in the Judea Province can put into typological and chronological categories with some bias towards religious attributions. The catalogues of Kennedy (1963), Rosenthal and R. Sivan (1978), Israeli and Avida (1988), Adler (2004) Goodnick-Westenholz (2004) are examples of the development of rigorous classifications and represent the first major understanding of the types and chronological order of lamps in the region. However, studies concerning production and economy such as Lapp (1997) and Adan-Bayewitz, Asaro, Wieder and Giaque (2008) have demonstrated the importance of petrographic analysis and microarchaeology methodologies for answering an even wider set of questions.

The main issue in lychnological studies is thus to advance our understanding of the role these lamps played in the Roman world. Archaeological studies of Roman lamps using regional and contextual approaches, which focus on patterns of consumption, usage and comparative perspectives, could shed new light on continuities and ruptures in relation to the style and agency of these objects and their production. Clay lamps were charged symbolic media and were a material culture used to create and maintain meaningful social relations and define identity, at individual, local and wider levels. The meaning given to clay lamps in Antiquity was ascribed through practice and action, governed by context, and negotiated and manufactured through ritual, in the daily experience and formation of guilds. Where the lamps were used, by whom and whether those consumption choices were influenced by region, period, economic status or social factors (Eckart 2002: 26) are important issues to address in studies of Roman clay oil lamps.

3. *Instrumentum Domesticum*: the Industry of Light in Antiquity

> *"(…) And now look again, and see what will naturally follow it' the prisoners are released and disabused of their error. At first, when any of them is liberated and compelled suddenly to stand up and turn his neck round and walk and look towards the light, he will suffer sharp pains; the glare will distress him, and he will be unable to see the realities of which in his former state he had seen the shadows; and then conceive some one saying to him, that what he saw before was an illusion, but that now, when he is approaching nearer to being and his eye is turned towards more real existence, he has a clearer vision, -what will be his reply? And you may further imagine that his instructor is pointing to the objects as they pass and requiring him to name them, -will he not be perplexed? Will he not fancy that the shadows which he formerly saw are truer than the objects which are now shown to him?*
>
> *Far truer.*
>
> *And if he is compelled to look straight at the light, will he not have a pain in his eyes which will make him turn away to take and take in the objects of vision which he can see, and which he will conceive to be in reality clearer than the things which are now being shown to him?*
>
> *True (…)"* (Plato, The Republic - 360 BCE)[36]

Light is a natural source of power and as such, from the beginning of time, has been a symbol veneration. It was closely intertwined with metaphorical aspects of life, religion, mythology and social psychology. It is a physical element of the human environment that has continuously been associated with ideas about the Divine and access to the knowledge of things. Lucretius influenced by atomistic thought in the context of natural philosophy (first century BCE) launched, in his work *De Rerum Natura*, the theoretical principle that visible light consisted of numerous and tiny solid particles, through which complex patterns emerge from the multiplicity of simple interactions (Emergency phenomenon). The philosophical principle of Lucretius has been developed over time and today his formulation is considered the precursor of the contemporary theory of Max Planck's photons (1858-1947).

Basically, light is an electromagnetic radiation that propagates through different materials and not through solids, known as opaques. The corpuscular theory of light considers that it consists of small particles, photons, whereas the wave theory regards it as a manifestation of energy, consisting of waves similar to sound, but far shorter in length. Recently, an experiment, led by

[36] Translated by Benjamin Jowett

Fabrizio Carbone and his research team at EPFL in the field of Quantum mechanics, has captured for the first time a snapshot of light behaving simultaneously (fig.6).

Bodies that have their own light are defined as luminous bodies and those that only reflect light from luminaries are termed as enlightened bodies. Most of the bodies around us are illuminated bodies. The Sun is the largest source of light we know., Oil lamps, the central topic of this thesis, are also luminous bodies, objects that produces fire as light emitter.

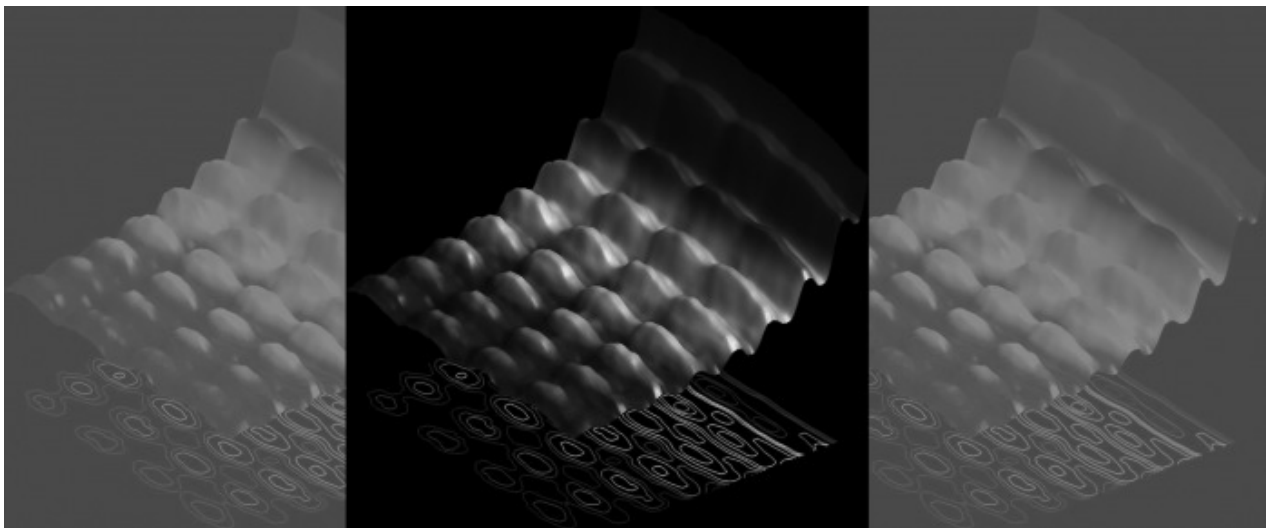


Fig. 8. Capture of light as a particle and wave simultaneously - by Fabrizio Carbone / EPFL, published in Nature Communications.

Oil lamps make their light using the fuel inside which chemically associates with the oxidant (O2) and is thus able to ignite in the presence of a source of initial heating. The triad of , oxidizer and energy of activation is responsible for the fire that provides lighting. Light is the rapid oxidation of a material which is combusted, releasing heat, reaction products (e.g. CO2 and H2O) and light.

The lighting of an oil lamp is a mixture of gases at high temperatures, formed by the exothermic oxidation reaction, with emission of electromagnetic radiation in the infrared and visible bands. The visible light, or the visible spectrum, is a small part of a possible electromagnetic radiation spectrum, extending from radio waves to gamma rays. Our eyes are not able to perceive those objects that do not have their own light and the aggregate of knowledge objects, things of our everyday experience, are, in short, the result of innate cognitive apparatus on the subjective data captured by the senses, mainly by the eyes. The optical spectrum, that is the visible range of the spectrum, fulfills cognitive function and is bounded by the ratio of lower optically exciting frequency (infrared radiation) and the highest frequency audible (ultraviolet radiation).

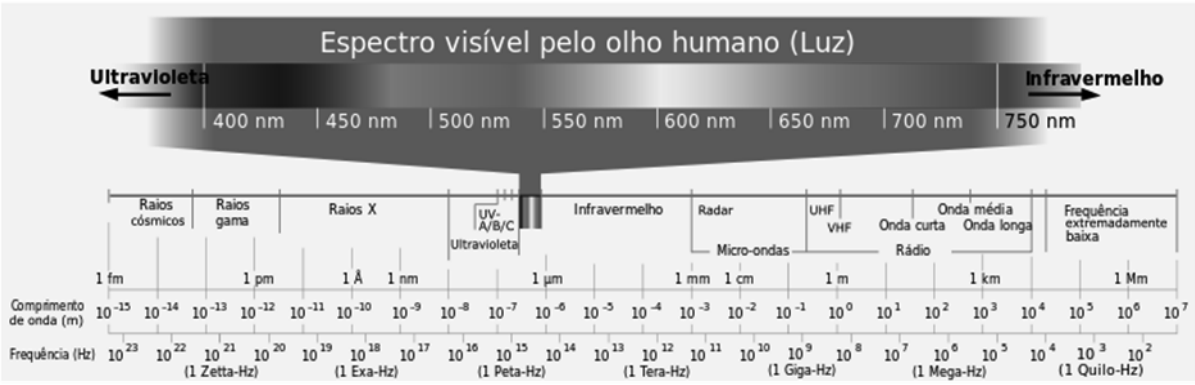


Fig. 9. Spectrum visible of the human eye.

In the next sections I will examine the provision of light in Roman society and attempt to demonstrate why it should be called an 'industry', as well as to emphasise the existence of supra-regional and regional monopolies of this industry, and the existence of exchange networks in which the production regions were involved. I will draw attention to the key role played by technical solutions to archaeological queries and try to address topics about the development of petrographic principles and material analyses of the clay lamps under analysis.

3.1. Light Provision in Roman society

Fig. 10. Main parts of clay oil lamps.

The provision of light in Roman society took place mainly through four *instrumentatum*. The *faces* or torches consisted of tow fibers or pieces of resinous wood soaked in bitumen or coal tar pitch, and they served to illuminate open spaces (e.g. parks, entertainment venues, roads); *candelae* or candles were made of wax or tallow with papyrus strands or tow. Usually they were placed on a surface such as a bowl or small plate, and were used to illuminate interiors; *lanternae* or lanterns were made of metal or ceramic, often with a cylindrical design and walls of leather, papyrus, glass or pottery. The illumination in this case was created by putting a candle or oil lamp inside the *lanternae*. Finally, *lucernae* or lamps were the most popular objects to for lighting in antiquity and consisted of a flame produced by the combustion of a wick (twisted or not), soaked in a liquid oil (Almeida 1952: 46). The main difference with the *lucernae* was the use of a liquid fuel. The most common of these liquids was olive oil, so a study of the industry of light needs to take into account (even if briefly) the production, consumption and distribution of olive oil.

Harris (2011: 163-164) estimates a consumption of nearly 20 litres of olive oil per person per year, implying nearly 200,000 hectolitres a year for a large city like Rome. Olive oil was essential to ancient Mediterranean people as part of their diet, an ingredient in soaps, medicines, cosmetics and indoor illumination. A considerable portion of the Empire had to meet its need for olive oil through imports, and large cities and the army created a demand for oil from afar. The provinces of Baetica, Tripolitania and Africa Proconsularis achieved very wide distribution of olive oil during the first and second centuries. The three-day sea journey, in good conditions, from Carthage to Ostia helped Africa Proconsularis in the Flavian period to win a substantial share of the Italian market, and in the reign of Marcus a *praefectus annonae* bought olive oil at subsidized price to the Roman market. Before the involvement of the Severan emperor (by the 160s) those who shipped olive oil to Rome were entitled to immunity from civil office-holding. For the eastern Empire, unfortunately most of the surviving amphorae are unpublished (e.g. Alexandria), and there are no focused studies on long-distance trade in olive oil in the eastern Mediterranean.

Due to a low vapor pressure, olive oil is nonflammable at room temperature, but if heated its vapor pressure increases. The evaporation of a liquid depends on its temperature and its surface. The function of the wick in an oil lamp is based on the capillary effect that means the liquid is consumed through it. Once embedded in the oily liquid and heated by the initial heat source through activation energy, the lighted wick end and carbonized carbon fibers cause evaporation of the fuel in the extension of wick surface, maintaining the flame.

The light of the flame emits the electromagnetic radiation for this luminous body. To emit radiation for a wide range of wavelengths of infrared to ultraviolet, the intensity, shape and maximum curvature of the produced wave will depend directly on the luminous body temperature. This means that with the increase of the intensity of temperature the amount of emission of short wavelengths (visible light) also increases, with the result that the light is clearer and brighter. The luminous flame of an oil lamp carries small soot particles that can be observed in the shadow of the flame against the wall, for example (the darkest shadow part).

The oil for lamp fuel (fluid unsaturated fat) could be lard, cod liver oil, as well as any other fat (triglyceride liquid or solid). The primary differences, which must have been known by people in antiquity, were the quality of light provided. Generally, fats (union of three fatty acids and one glycerol molecule) can be differentiated into saturated fatty acids (animal fat) and unsaturated fatty acids (vegetable shortening). Triglycerides in liquid form have a reduced production of soot and due to their greater power, the flame produced is brighter and the light efficiency is thus higher, mainly due to the presence of hydrogen. However, fats with a high content of saturated fatty acids, in addition to the large amount of soot, make the flame darker and less efficient. Another negative factor is that solid fats become too viscous and cancel the conductive effect of the wick.

A “normal" flame of an oil lamp would have an efficiency of approximately 0.01-0.15 lm/W measured with Lfa. Power consumption, by contrast, would be enormous. The flame of a common lamp corresponds to a power consumption of 85 Watts. The objects that produced a higher flame would have a consumption of 20g of oil per hour, which corresponds to 760 kJ per minute, equivalent to an energy consumption of 200 Watts (Wunderlich 2003: 256). The size and shape of the wick was directly relevant to the size of the flame and the issue of energy. Glass fibers and asbestos materials are suitable for the wicks, which must not be made of flammable materials – a common mistake. Cellulose, while it carbonizes the wick results in a carbon fiber which catalyzes the combustion process without disintegrating.

Fig. 11. Lamps from North Africa, Museum Cripta Balbi, Roma.

Light sources required a high level of maintenance and to be brighter would require multiple sources, like a chandelier or a bundle of sticks to make many lamps. A lack of care for the flow of sebum and the sailing location could cause flammable accidents. The cost to maintain multiple forms of lighting was certainly a barrier and limited access to parts of the population. In addition, the oils used for lighting were also useful in cooking, and in case of choice, cooking would be prioritized. Depending on the size and filling of the reservoir, a lamp can burn for hours or even days without any intervention. The basic maintenance of an oil lamp would be the adjustment of the wick and the cleanliness of the object. It should be remembered, of course, that to obtain the light you first needed the activation energy for initial heating. This objective could be achieved rubbing sticks or using stones, steel or tow. The practice of creating fire with these resources is something that for many of us these days seems to be an almost superhuman task.

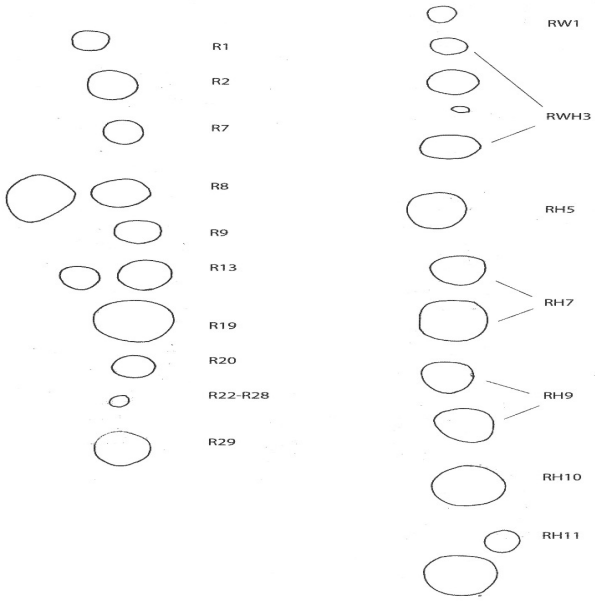


Fig. 12. Main forms and wick sizes found in Israel (Sussman 2021:2).

In the time of Aristophanes (446-386 BCE) lampmaking had become a specialized trade, as is evident from the Greek term lampmaker From Pliny (Natural History 34.11-13) we have learned from the Clesippus episode about what happens to a society when social distinctions become blurred under the power of light, materialized through oil lamps: Gegania acquired a Greek candelabrum at a high price and received the Greek slave Clesippus as part of the deal. The Greek slave had to perform naked for the guests of Gegania when she was showing the new devise to the members of her social group. The anecdote explains that Gegania started a relationship with Clesippus after the performance under the candelabrum light. Grateful to the efficacious object the slave thereafter venerated the candelabrum like a god (Bielfeldt 2014:172-173). Maybe one of the most important roles of lighting devises is that they deeply affect the perception of space, that opens up around them, as well as certain sensations. Thus, it is important to look at the spaces created by lighting devices together with the lighting objects themselves and how they were arranged and installed – all of which made a difference to the effect of the light emited.

Roman cultural identity, according to Wallace-Hadrill (2008), evolved together with an emerging consumerist culture. After a first phase of the aggressive appropriation of Hellenistic luxury goods that had arrived as war booty, Rome sought to create an international market for exclusive tableware in bronze, with various production centers in Greece and the Greek east, such as the cities of Alexandria, Delos, Aegina and Athens, from where the finds of the shipwreck from

near Mahdia (Tunisia) seem to originate. The same seems to happen with the market of oil lamps at Palestine and North African, mainly regard to kitchen and common wares.

Fig. 13. Harvard collection of bronze oil-lamps and lighting devices.

As suggested by Wallace-Hadrill, bronze and oil lamps became a currency through which social status was negotiated. Wallace-Hadrill rightly emphasizes Roman *instrumentum domesticum* have not received the scholarly attention they deserves, and that is, first and foremost, a matter of scholarly preference. To correct this gap in research, a useful approach to the study of lighting would be to look at the intrinsic relationship between the function of the lighting object and its decoration. If we take this research as a socioeconomic study, in reducing theses objects to commodities of a high market value, the mercantilist approach risks fattening the complex cultural picture of Roman society's increasing attraction to banque implements. If we want to find the key to the enigmatic social life of Roman oil lamps, we have to consider their visual and aesthetic qualities alongside other aspects of this material culture. Such a coherent interpretive approach will allow broader reflections on the aesthetic and emotive efficacy of Roman lighting equipment - and ultimately, on the relationship between the design and function of the object.

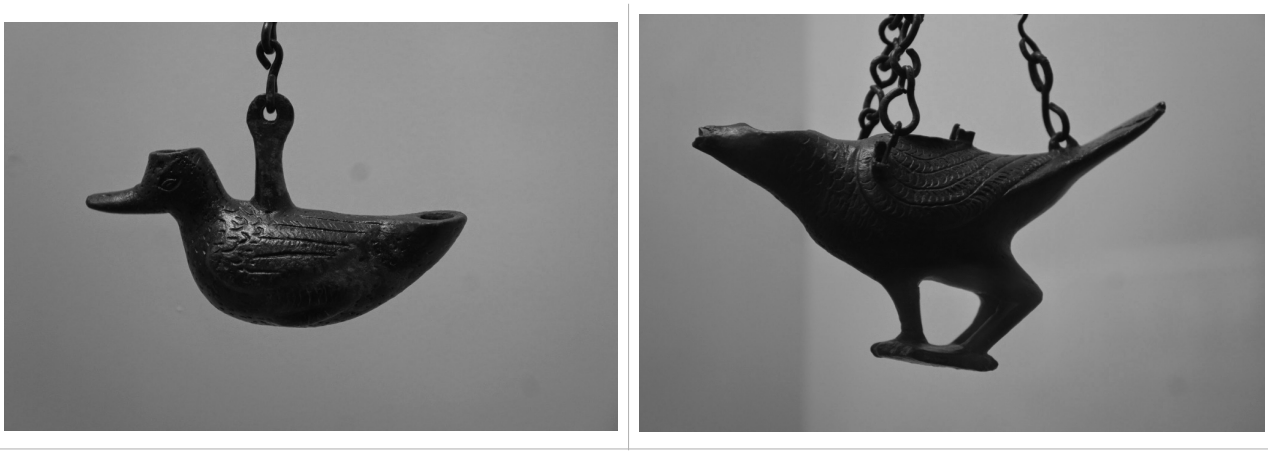


Fig. 14. Bronze oil-lamps from the Museum of Rome.

Fig. 15. Bronze oil-lamps from the Museum of Jerusalém, Israel.

We should try to avoid traditional conclusions where the presence of a given assemblage of pottery is auto-reflective and informative on the economy of a site and/or the social position the community. Pottery studies should always be based on a embedded approach, linking all other types of evidence of a non-pottery or even non-artefactual nature (Poblome 2004: 491-506). It is important to note that studies on Classical Archaeology come with an enormous weight of traditional of research, and craft studies are mostly restricted to creating typological catalogues, developing chronologies and looking at certain aspects of production, mainly connected to the provenance of the objects and the reconstruction of distribution patterns, as well observed by Poblome. A traditional classificatory framework should never be an end in itself and must reveal patterns of daily life in antiquity: objects were were designed with certain purposes in mind. Function and design are linked and the mastery of craftsmen had to take into account the potential customers, who were in a position to accept or reject new products. The degree of sophistication in

conceiving forms was dependent on the mode of production, and several factors were at play when introducing a specific new line of products on the market. Customers seem to have judged the quality, functionality and affordability of the products, before considering their fashionableness. The diversity of forms, figures, themes and patterns of movement correspond to a carefully crafted composition that unfolds a narrative of the light-emitting power of an oil lamp. Through the material and visual interaction of flame and container this power materializes itself in a variety of figural motifs (deities, animals, plants, etc) which illustrate its efficacy and narrative potential.

Enough information is now available to justify an overall discussion about the organization of the oil lamp industry in the Roman East and its connection with North Africa. A study of artisanal production should consider more ways to make typologies work with what we know about the Roman ceramics industry and commerce. However, there are a great number of surviving oil lamps in many areas of the Roman Empire that may never be fully catalogued and so it will always be difficult to fully reconstruct the material into the known framework of Roman life.

Despite the criticism of Pucci (1973) about applying the term 'industry' to a mode of production from which power-driven machines were absent, we should consider that any production of artefacts in large numbers can be called an 'industry', since production must have been organized, even if it did not include large numbers of workers (Harris 2011:115). Harris attempted to approach the industry of light mainly through the inscriptions on lamps and was able to put together names inscribed on many thousands of terracota lamps and relate this activity to known social and legal Roman institutions. He created a list of marker's names and roughly 1,700 were inscribed in Latin while roughly 400 were in Greek (Harris 2011:117; Mercando 1973). Of the Latin marks, Harris's main concern, 20–25 per cent had a significant circulation away from their presumed area of manufacture. Balil (1968a: 161) estimates that in Rome itself some 30–40 per cent of lamps in burials of the period from the late first to mid second century are signed. By contrast, in Spain, he estimates that only 10–15 per cent of all terracotta lamps were marked in this fashion.

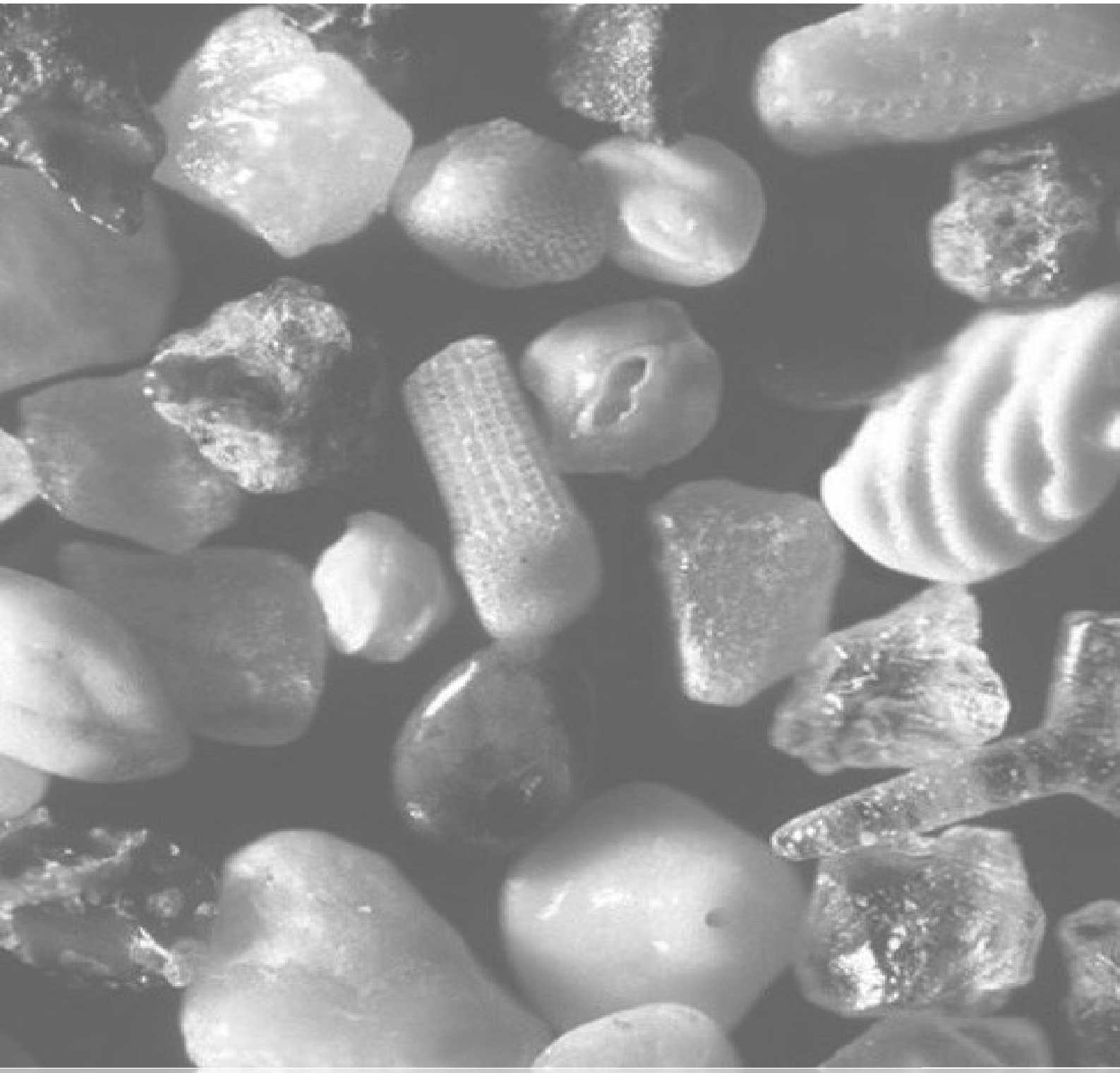
One might have expected that all simple terracotta lamps were made by small local enterprises who seldom exported them beyond their primary territory (a local town or village). Indeed this was one part of the system and certain marker's names and the diffusion of certain lamp-types provide evidence for oligopolistic practices, in which the enterprise took into account the style of production of other lamps and their demand in order to sell their own products.

This suggest that something more complex than local distribution was going on. In this scenario, the figure of the *institor* or branch manager held a particular role. The concept of different oil lamp (also tableware) types can therefore be regarded as a model of negotiation between fashion and mainstream in which different groups were able to express different messages (Poblome 2004: 491-506). It was only when the production regions could capitalize on their potential by linking to larger interactive networks that the distribution of regional products really started to experience phases of economic growth. Thus, near supra-regional and regional monopolies certainly must have existed, but to reconstruct these networks, the availability and quality of the raw materials, and the existence of exchange networks in which the production region was involved would need to be known.

The idea behind the concept of primary and secondary organization is to pin down the uncertain provenance of many lines of oil lamp production as well as to look at how production related to markets, how units of production related to one another, and how the relationship between distribution and consumption worked in the Roman world. Consumption patterns have received less attention than they deserve in past research, this is perhaps because such research requires an interdisciplinary approach to help model the conceptual agenda of artisanal roman production. (Poblome 2004: XX, 2013; Dobres 2000). Archaeometry has played a key role in providing technical solutions to archaeological questions, and network analysis has the potential to access patterns of interaction within these categories (Brughmans 2010; 2016).

Society, which undergoes a constant process of change, mostly endogenous and taking the form of self-transformation, is the ultimate motor for the agential power of human individuals or social collectivities. The direction, goals and speed of change are contestable among multiple agents, and become a constant arena of conflict and struggle. In this sense, 'action occurs in the context of encountered structures, which it shapes in turn, resulting in the dual quality of structures (as both shaping and shaped), and the dual quality of actors (as producers and products)'(Dobres 2000: 147). Thus, the interchange of action and structure occurs in time, by means of alternating phases of agential creativeness and structural determination, which allows material culture to play a key role in cultural change.

SAMPLES AND METHODOLOGY



4. Ceramic Petrography Analysis: Methodology

"Thin section ceramic petrography is a versatile interdisciplinary analytical tool for the characterization and interpretation of archaeological pottery and related artefacts, including ceramic building materials, refractories and plaster".
(Quinn 2013)

The study of minerals and rocks used by ancient potters and societies over time and space, as implements, ornaments, building materials and raw material for ceramics and other processed products, with attempts to date, source and otherwise characterize artefacts made from earth materials has been referred to as archaeomineralogy (Rapp 2009: 1). As an expansion of optical mineralogy, often known as Ceramic Petrography, this discipline can be defined as the examination and interpretation of the selection of raw materials, ceramic technology and provenance determination, as well as the systematic description of ceramic materials, their compositions and organization under polarized light microscopy analysis; either by making thin-section, or by crushing a slice of pottery to a suitable size to be examined as grains (Whitbread 1995: 365).

A sound knowledge of rocks and the formation of clays, as well as source locations are essential aspects in Ceramic Petrography as related to archaeological questions; in antiquity most rock and mineral sources were regional or local, making it valuable to researchers today (Rapp 2009). Because clays originate from the weathering of primary source rocks (e.g. by water, carbonic acid, erosion or volcanism) they fragment into very small particles. Thus, the nonplastic constituents in the clay body of a lamp, such as those under analysis here, should reflect at some level the composition of the primary source rocks.

Clay was categorized in the initial petrographic studies of the late nineteenth century as the finest particle size (less than 2 μm) of a rock. Mineralogically, it refers a particular composition (hydrous aluminum silicates) of a certain group of minerals, phyllosicates. Chemically all clays are composed of silicon dioxide, aluminum trioxide, and water, and are expressed by the formula: AI_20_3 $.SiO_2.2H_2O$. Generally speaking, clay is the name of the very fine grained unconsolidated earth

minerals which are workable and flexible when wet and became a stony material when heated that acquires hardness, strength, chemical and physical stability; and also when dried clays turns into hard fired clay that retains its shape (Goffer 2007:231; Rice 1987: 152-166). However, in terms of ceramic materials, clay may be considered as sediments with various proportions of clay minerals, or as deposits (*in situ*) within geological formations, distinguished by two particular geological (primary and secondary clay) types and their technological properties appropriate for making pottery.

The primary clay, or residual clay, is developed from chemical alteration of other minerals and is usually quite pure and colourless or white. It has very small amounts of minerals mixed in and iron oxides, and quartz may give it a yellow, green or brown colour in the geological process. Secondary clay is a sedimentary clay transported by the weathering processes of rocks and is mixed with other mineral particles during this process (Goren et al 2004:4-6).

The secondary, sedimentary, clay, when it is finally deposited generally contains over 50% non-clay matter (e.g. organic matter derived from animal and vegetable waste, limestone, iron oxides and sand) and the refinement of the particles is the result of mechanical friction during the transportation process. Sedimentary clays were almost exclusively used by potters in the Ancient Near East, and two particular types were used for making ceramic objects: ball clay, which is rich in organic matter, and red clay, which is rich in iron oxides (Goffer 2007:234). The iron oxides make the clay red, brown, green or yellow and further organic matter tends to darkens the clay. During the firing process this clays may turn red because the iron ions are oxidized and became a rich red at high temperatures. Ancient technologists, unaware of chemicals and mineral components, would nevertheless have developed a keen awareness of the characteristics of the material, its taste, smell and appearance (colour changes and material transformations) to identify and use their sources.

39% of rock-forming surface minerals are composed of feldspars; 28% are quartz, 18% are clay minerals and micas, 2% ferro-magnesian silicates and 9% are carbonates (Herderson 2000: 111). In addition to the color, luster, hardness and specific gravity, the differences between minerals can be expressed by their characteristics of fracture, cleavage, and crystal form. Calcite tends to split to rhombs, micas cleave as sheets along the planes of their structures and pyroxenes split along their crystal axes at known angles. The transportation process is reflected in the surface of the minerals and the family of feldspars, quartz and olivines, with their characteristic blocky and

squarish equant forms, are discernible from the second family of pyroxenes and amphiboles, which present a stick-like, thinner and longer shape.

Fig. 16. Sampling for thin-section (Nardy e Machado 2002:12, fig.II.2).

The combination of silica (60.1% of the earth's crust) with other elements form silicates. The silicates are a compound consisting of silicon and oxygen (silica), one or more metals and hydrogen. The structures of silica, alumina and water are arranged in sheets through the combination of the water component which breaks down into oxygen and hydroxyl components in clays and produces two 'building blocks' combining silicon and alumina in different ways. The first one is silicon combined with oxygen atoms to form a tetrahedron and the second is aluminum combined with hydroxyl or oxygen groups. The atomic structure of clay types change and the ratio of silica to alumina varies (1:1 to 4:1 or higher). The water component may vary between c. 13% to 35% (Herderson 2000: 113). The presence of various minerals and their oxides determine the chemical composition of the clays. At least 20 distinctive types of clay may be observed chemically but the chemical composition is not sufficient for characterizing a clay. Most minerals have particles that consist of platelets, flat sheets which form layered arrangements with extensive surface areas. In some cases, the particles of minerals present fibrous or tubular shapes (Goffer 2007: 333). Thus, one of the best ways to characterize different clays is through their crystal structure.

Clay appears in thin-section as a homogenous mass that is translucent at 30µm and normally has brown absorption and interference colours in PPL and XPL. Thus, clays consists of minute plate-like mineral crystals <2µm in size. Different types of clay minerals exist in nature due to their relative proportions of alumina, silica and water and the alterations of these elements within the basic chemical formula that define clay. (Quinn 2013:39-42).

A range of social, political, ritualistic and geographical factors may have determined the exploitable territory for clay, eventually far beyond the 10km that has been suggested as the upper limit (Arnold 1985:32-60) for potters (Goren et al 2004: 7). Despite the accepted norms for the development of the clay lamp industry and the collection of their raw materials,, the evidence also suggests that there were plenty of exceptions. The centralization of certain industries is intimately bound up with the importance of their location in the landscape and the meaning of the place. Landscapes are formed by sets of relational places, literally and metaphorically attached to memories, emotions and associations derived from personal and interpersonal shared experiences (Tilley 1994; 1999:177-180). They are permanently embodying myths, stories, rituals and the naming of places. The knowledge and metaphorical understanding of landscape are related thus with the movement between places, the human body in a place, and finally with the personal experience of space (Massey 1994: 24-272; 2005: 149-163; Featherstone and Painter 2013:19-178).

Mineral and rock fragments occurring in clays are provided by various transport processes and deposited in different depositional environments, and they therefore experience dissimilar erosion cycles. The depositional environment and water erosion, as well as other erosive agents, determine changes in the morphology and grain size of the sediment used to produce the pottery. In this way, each clay deposit has a characteristic grain size that distinguishes it from others. These erosion cycles thus determine the relative ratio of the constituent particles and the texture of the clay. The texture is a parameter that involves complex mechanical effects and influences the final properties of the materials. Thus, for example, clays improve their plasticity through long periods of exposure to weathering, where variations in temperature and humidity cause physicochemical alterations in the materials and promote the formation of finer fractions (Rice 1987: 347-370). Hence, the characterization of the sediments by particle grain size analysis provides important information about the environment in which the sediment was deposited and its degree of alteration of the particles (Hein et al., 2004a; Santacreu 2014).

This summary of the science of clays and petrology demonstrates that this method is suitable is suitable for examining clay lamps, their market, and relationship within the landscape, their method of manufacture and symbolic religious attachment that these objects afford in different parts of Roman Mediterranean.

Fig. 17. Oi lamps for thin-section sampling in the Laboratory for Comparative Microarchaeology, *Tel Aviv University*, Israel.

Archaeology can be recognized as a hypercomplex social science with a wide range of links to others disciplines, including not just the humanities but also biological and physical sciences. Archaeology as an ecology of tacit and mundane, rich and nuanced practices that work on material pasts in the present, has a particular kind of care, obligation and loyalty of things (Olsen et al 2012). The historical development of material science and archaeology, especially in regards to mineralogy has its background in three key books: Theophrastus's *On Stones*, Pliny's *Natural History*, and Agricola's *De Natura Fosilium*[37]. The evidence for the ancient use of minerals and rocks is abundant, but one of the first interplays between archaeology and material science dates back to the nineteenth century with the analysis of the pigment Egyptian blue ($CaCuSi_4O_{10}$ or $CaO{\cdot}CuO{\cdot}4SiO_2$); a pigment made from copper, silica and natron. The discovery (made by Humphrey's Davy studies in 1815) of what is considered today the first synthetic pigment known,

[37] To have a deeply overview on the study of minerals and their use and occurrences in Classical, Medieval and Arab Periods, see Rapp 2009:4 -16.

the calcium copper silicate, was largely used until the Roman era and a significant research discovery that opened up new avenues for further studies in this area of archaeological science.

Henderson (2000:324-326) separates the development of links between archaeology and material science into four main phases. Namely, the early stirrings (phase one), which dealt with investigations that revealed unexpectedly sophisticated aspects of ancient technologies, such as in Schliemann's excavation report on Mycenae about the chemical analysis of gold, copper and bronze. However, during this first phase, there was no full integration with archaeology since the technological conclusions were based on a small number of archaeological samples. The creation of new techniques precisely designed for the archaeological endeavours was the next step forwards in the grown of the discipline (phase two). The development of thermoluminescence in Oxford demonstrated the enormous potential for the analysis of material culture, but at the same time was seen as a supplementary technique to carbon-14 applications.

Whereas the two previous phases of research were concerned with technological aspects and methodological invention, true archaeological science research (phase three) was developed in the 1970s. Renfrew's research into obsidian using optical emission spectrometry produced sufficient data that could be linked directly to the distribution of material and the reconstruction of humans' past behavioural patterns. Other techniques such as X-ray fluorescence spectrometry, neutron activation analysis, and electron probe microanalysis also played an important role during this phase of development, helping to refine and strengthen the links between archaeology and material science. Today we are in the last phase of the development of links between archaeology and materials sciences (phase four), defined as 'holistic archaeological science' in which a 'careful integration of the application of science to answering archaeological questions in a holistic approach to this area of discourse can produce by far the most powerful results with the greatest contribution to mainstream Archaeology' (Henderson 2000: 326).

The analytical techniques applied in the study of material culture today is known as archaeometry, and encompasses qualitative and quantitative methods applied to diverse corpora of data to study material culture and past societies. The application of these techniques and methods from the natural sciences has provided relevant information concerning the technology of past societies. The use of this analytical tool potentially allows us to deal with the complexity embedded within material culture, for instance within the context of this thesis, to look at the way past

societies conceptualized, produced, used, maintained, exchanged and deposited their pottery (Santacreu 2014:2).

Thus, archaeology is basically concerned with the investigation of the archaeological record as a whole, both the macroscopic and microscopic records. an object-oriented approach taking thing One of the basic aims of the analysis of an artefact is to identify the mates, their objected and materiality is fundamental to archeological research. The microscopic record is composed of the materials from which the macroscopic artefacts are made and their sedimentary matrix (in which they were buried). The archaeological information that can be extracted from this record, invisible to the naked eye, also can be referred to as microarchaeology, embedded within the broader process of the interpretation of material science techniques (Weiner 2010: 1-10). The result is the characterization of the ceramic's technological features through archaeometric techniques, which permits us to collect a broad and solid dataset from which we can develop different interpretations about the society that created and/or used the pottery. Therefore, studies focused on archaeological ceramics have been substantially enriched by the implementation of chemical, physical and mineralogical analyses. This improvement has enabled us to improve the information obtained by more traditional typological classification and less sophisticated macroscopic methods.

The scientific investigation of evidence of an ancient cultural industry of light-emitting artefacts should also take into consideration the physical distribution of petrographically (and chemically) defined raw materials, products and by-products, as well as the structures connected to the production, distribution and consumption of this kind of production. An attempt to assess manufacturing activities related to chronology and the scale of production is important, since this is related to the organization of the workshops in terms of settlement patterns. Other related cultural industries (e.g. coinage, mosaics, etc) at the same period and on other sites should also be taken into account to look for similar patterns. The relationships between style, technology and typology of artefacts are key to an interpretation of distribution patterns and past behaviours. Attention must also be paid to the development of oil lamp ceramic forms and designs which were constantly changing and improving, and the manner in which these developments were reflected in the production process.

To carry out the research here, a carefully-structured programme needed to be formed, in which the problematic was clearly defined and the sample suitable for the analytical investigation of raw materials, products and by-products, to allow for an informed interpretation. This research

works on the assumption that each action is linked in time and space to other future or past actions, forming chains which together form networks, and the dynamic social processes operating at the microscale may have considerably contributed to macroscalar processes, all helping us to form frames of reference (Dobres and Hoffman 1994:213; Gosden 1999:15-17). These frames of reference make up large-scale structures of action; scale within which individuals act and where they are socially constructed through prescribed acts between them. The conceptualization of scales of analysis must therefore encompass the view point that both macroscopic and microscopic scales need to be constantly interacting if we are to ask clear questions of both types of record, using information from archaeology and the natural sciences (Weiner 2010:9).

Any contextual study of archaeology should finally provide inferences about social, political, and mental structures, with the human body and material culture as key to processes of social and cultural interaction. In short, technological practices are inextricably rooted in social relationships and always engender meaning. Technologies are materially grounded arenas wherein social and material relations occur while people take care of the daily practical matters. Simultaneously they are shaping and being shaped by each other. Thus, the identification of the provenience of a particular artefact, or group of artefacts should be used as an aid to access a picture of the dynamics of knowledge, choices, processes of construction and contestation of power and identity, as well as to understand the context-specific of social relationships and cultural changes (Dobres 2000: 127).

The material past is often studied as an entity separate from the present, and too much focus is put on typologies, classification and standardization. However, the division between past and present is artificial, the past is all around us, and is spatially coextensive. This highlight man's ability to remember the past and to anticipate the future, the so-called "mental time travel", and leads us to the conclusion that we are constantly "living in the past" (Tulving 1985:1-12; 2000). The same past that surrounds us with its remains so we should approach its study through multiple perspectives. Memory is essential for constructing scenarios in the future and projecting forwards.

We store a handful of impressions of what happened in the pst, just bits and pieces we weave together into what feels like a seamless narrative. Each time we tell a story, we embellish it, while remaining genuinely convinced of the veracity of our memories. But we never retrieve the original memory, only the last one we recalled. So, when we retrieve a memory we are also rewriting it (Roediger 2013:1-3). Materials science has an important role to play in the examination of social

relationships through the analysis of the creative way in which people establish alliances with the material world and the mode by which humans act through materials to establish and/or mediate relations.

Material culture is usually transmitted through through kin-based learning networks, and the pottery oil lamp workshops from Roman Palestine and North Africa are good examples of maintenance and evolution of material forms. Learning networks involve the working of specific materials through social demonstration; hence the physical form of artefacts embodies previous manual techniques and the repetitive production of artefacts or specific actions related to them draws on an affinity with objects in which memories are evoked and channelled (Jones 2002: 87). The technical actions and production of artefacts are a manifestation of how humans represent themselves. Therefore, the ideas about the processes, technical elements, and actors involved in this process, are tied to broader social relations and the logic that seems to drawn and influence the representations of the period (Lemonnier 1993: 3-4). Roman oil lamps are related to archaeological pottery studies as a particular artefact in which the capacity for affording action and agency can produce profitable research results. The social acts of the production and use of oil lamps in context often offer expressions of specific social relations that can be archaeologically visible in patterns of similarity and difference between forms and styles (Olsen et al 2012:6-8). These social acts are at the nodal points of learning networks and the resulting production of material culture (Brughmans 2010, 2013, 2014; Brughamans and Poblome 2016a, 2016b; Collar 2007, 2008, 2013, 2015; Poblome et al 2012).

In order to provide adequately detailed data regarding the composition, social and spatial organization of Roman oil lamps, the sampling strategies were conducted at microscale level as well as macro scale in relation to intra-site contexts. In this perspective my principal two analytical aims were: 1) To identify analytically the composition group/groups characteristic of the so-called Syria-Palestinian discus lamps, a type of Roman Discus lamp in use mainly during the 2nd and 3rd centuries CE by means of thin-section analysis and comparative research, in order to identify more workshops[38] in the Levant providing further information about their source/sources; 2) Compare this data with the published archaeometry data, modes of production, distribution and consumption of Roman Discus lamps from North African workshops, against their social and economic contexts.

[38] Lapp 1997: 147-154 has identified at least two compositional groups that fall into the Palestinian discus lamps (Petrographic Paste Group 1 and 6) and a possible workshop in Beth Shean.

Both the identification of Roman discus lamp workshops in Israel and a comparative study with North African production has not been done before, and North Africa is recognized as one of the main pottery-making areas of this period, especially from the 4th century CE onwards. North Africa lamps have been found far from their place of origin (including in Israel), leading us directly into possible relationships and patterns of exchange between these regions, still understudied.

In short, the principal aim of this research is to trace the the distribution of this well-known class of Roman clay lamps in order to understand the exchange mechanisms, trade networks, economic and cultural relationships that took place between different archaeological sites and regions. Such a study will allow for the characterization of these different archaeological sites and their pottery record, with particular attention to lighting and its evolution. The identification of production centres and interregional distribution patterns, as well as production processes may shed further light on consumption patterns and the ritualization of clay oil lamps in relation to social organization.

Fig. 18. Sampling oil lamps in Tel Aviv University, Israel.

Fig. 19. Sampling polished with Buehler Metaserv.

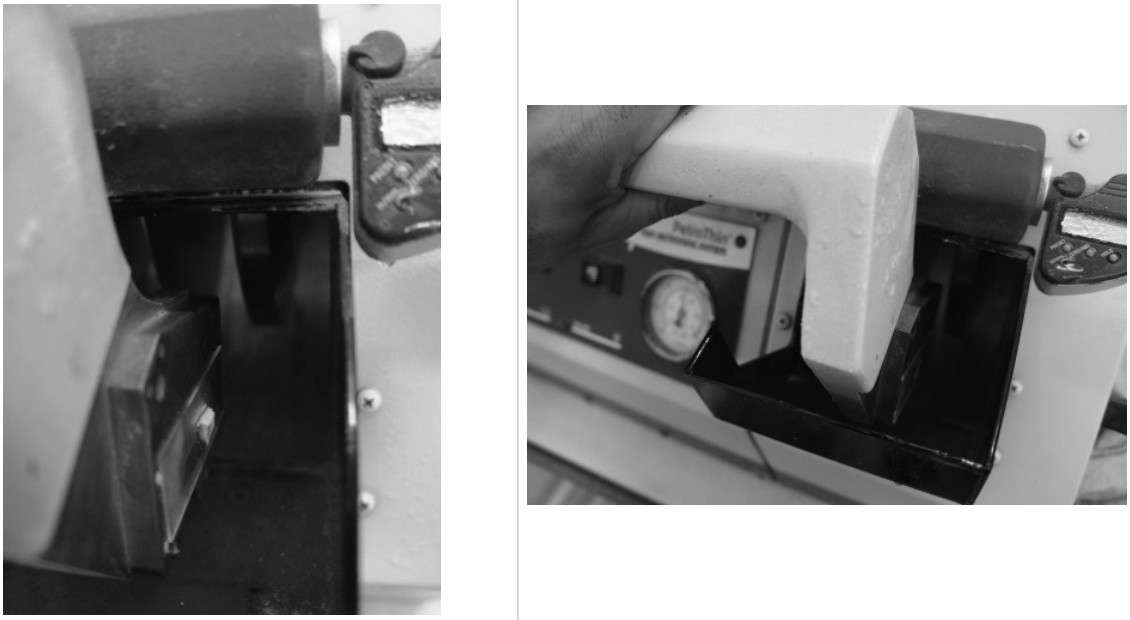


Fig. 20. Polish of thin-section with Buehler PetroThin Sectioning System.

The archaeometric study will establish petrographic reference groups, and other complementary analytical techniques will be used to find out the chemical composition data of pottery, through X-ray fluorescence (XRF), instrumental neutron activation analysis (INAA), X-ray diffraction (XRD), and the use of a scanning electron microscope (SEM). Research into the chemical characterization of pottery from workshops and production centres across the Mediterranean is now well established and reference groups related to specific areas of production exist, which this project will add to, allowing for macro-scale level interpretations. Each of these scientific methods has advantages and disadvantages that provide relatively accurate descriptions of

the mineral composition of the samples. Scholars have determined the provenance of the raw materials used in pottery production by comparing the chemical, mineralogical and petrographic results from ceramic assemblage with the available clay sources in the area or sediments found at the archaeological sites. The reference groups usually relate to local sources and known production centres defined by the research (Adan-Bayewitz and Wieder 1992; Lapp 1997: 147-154; Bonifay, Capelli and Brun 2012).

The use of petrographic analysis in geology was first documented in the second half of the nineteenth century and there have been significant methodological developments since the 1980s regarding the protocols used in ceramic analysis. From at least the 1990s onwards, the interpretation of X-ray diffraction patterns has been applied systematically in ceramic studies because it allows for the identification of the main crystalline phases occurring in clays and also provides broad descriptions of the mineralogical composition of the ceramics. The diffractograms developed to classify samples into groups also support the mineralogical features and identification of crystalline phases associated with primary and secondary peaks (Tite 2008).

Ceramics often have a very similar mineralogical composition, and sometimes it is only possible to determine variations in the amounts of quartz or carbonates. Thus, in most cases the implementation of petrographic analysis was followed by with other approaches, such as chemical, textural, and paleontological studies, allowing for a more accurate assessment of the provenance and technology of the samples. Moreover, these additional techniques also provide key information to corroborate our understanding of the petrofabrics classified through optical means, which often vary depending on the raw materials selected and the potter's actions, as well as the techniques used for the clay preparation, manufacture and distribution of the pottery. However, petrography goes beyond a purely geological scope: thin section itself can answer questions about paste preparation, firing processes, deposition of vessels and social factors and inscribed through social action.

It is important now to highlight the difference between the term "clay mineral" and "clay fraction". Clay minerals are compounds whose crystalline structure is formed from a stack of layers of tetrahedral and octahedral sheets that are linked by water molecules or residual bonds. The term clay fraction refers to the grain fraction of the sediment (regardless of the minerals) that is up to 2 μm in size. Although many of nonelastic minerals such feldspars and quartz are equal to or less than 2 μm, clay minerals are not limited in size to this fraction. In this regard, a paste with about 15% of clay mineral particles up to 2 μm in size will provide some plasticity, and silty clay deposits provide

suitable raw material for pottery production when available (Rice 1987: 31-78). Thus, it is more the properties of the parent material that determined the use of soils for pottery production, than the extent soil development.

This research focuses on the study of pottery production through the archaeometric analysis of ceramic pastes and fabrics combined with the archaeological research of objects and sites. The archaeometric characterization of fabrics is basically focused on defining the petrological, mineralogical, and textural composition (not using chemical analysis) of the oil lamps under study in thin section. Macroscopic approaches to the ceramic record form an essential part of this archaeological research and are indispensable in the study of many aspects of pottery such as modeling techniques, typology, surface treatments, firing process, decorative patterns and styles. However, the application of microscopic and compositional analyses is also necessary to examine more deeply the technology and study of ceramic pastes and fabrics. These analyses allow further classifications of the oil lamps that can be meaningfully related to different technological and cultural dynamics and distribution patterns.

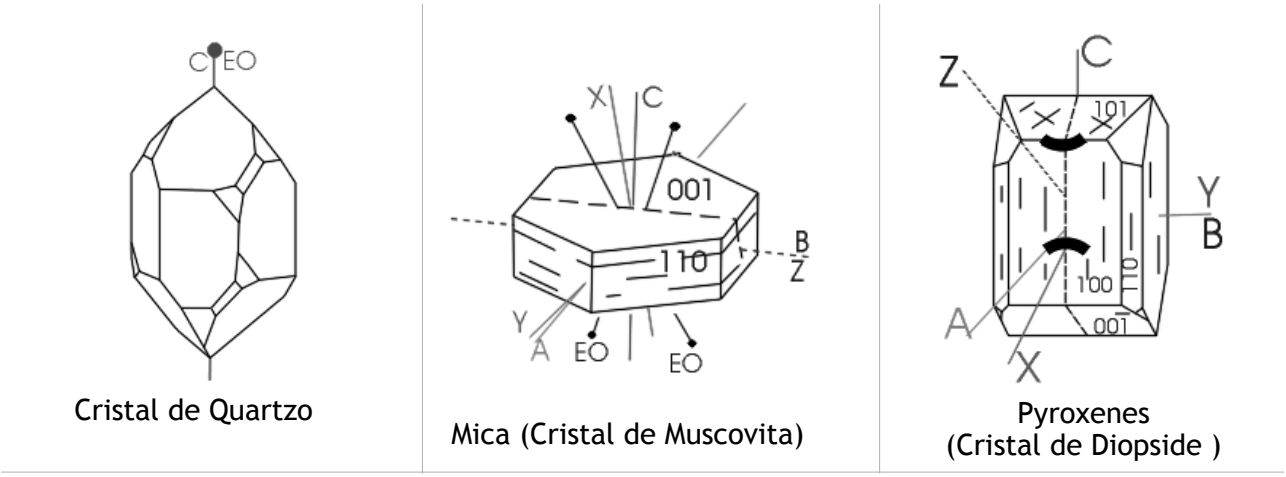


Fig. 21. Surface morphology of minerals (Nard e Machado 2002).

In addition to the primary goals, a polarizing petrographic microscope was used to determine what type of clays were used by the lamp makers; whether nonplastic elements had been added and if the tempering agents can be linked to specific geological areas; whether the lamps had been fired in a reducing or oxidizing atmosphere; and whether lamp pastes can be texturally distinguished and classified on the basis of the respective samples aplastic inclusion content. Most Roman-period lamp fabrics tend to be fine grained and well levigated, but the application of

petrographic analysis has helped to further define petrological and textural features (Adan-Bayewitz et al 2007: 10; Lapp 1997:118; Bonifay 2005; 2007: 148-156).

In the following sections, petrographic, textural and micropaleontological analyses will be uses on the ceramic samples. Such analyses are widely used in the characterization of ceramic composition at different stages. Thus, the usefulness of each one of these analyses in the study of raw material origin, paste preparation, modeling techniques, surface treatments, firing processes or post-depositional alterations will be highlighted. Also, special attention will be paid to their role within pottery studies and their archaeological implications.

Furthermore, the employment of polarizing microscopes and other techniques of archaeometry will aid our understanding of the places under investigation, allowing for futher specific questions to be asked. By using the polarizing microscope, the unique arrangement of atoms within any given mineral will exhibit differences under polarized light. Although the clay itself can be distinctive, it is the nonplastic mineral inclusions found within the fabric (in this case of clay lamps) that can often supply the best information; one can identify types of inclusions and relate them to their geological environments. Ceramic pastes usually include aplastic components either as temper (i.e. material intentionally added by the potter) or as natural constituents of the clay (Rice 1987: 72-75; Shepard 1965:24-31, 53-54). Nonplastic inclusions are added to pottery vessels to increase the workability of the clay by reducing its plasticity and preventing shrinkage during the firing process.

Clay and temper types can help locate the unique petrographic resource area of a site, helping the petrographer to identify from where a particular community of potters collected their raw materials and the threshold distances (Arnold 2005:16-17). This is important because previous studies have highlighted the use of coastal sand as a temper in the production of pottery in Levant (Cohen-Weinberger and Goren, 2004; Smith et al 2004). When lamp pastes contain aplastic inclusions of a limited geological distribution and additional information can be gleened from soil maps, it is possible to pinpoint the available clay resources of these artefacts more precisely.

A trained analyst will almost subconsciously perform rapid petrographic identifications of the inclusions and features in thin section at low magnification. Indeed, much of the initial grouping can be performed by eye. Visual grouping relies upon storing a mental impression of each thin section before moving to the next. As the groups or piles of section grow, it may be necessary to refer back to the nature of the earlier samples to refresh one's memory. Grouping large assemblages

of thin sections, or those with less obvious differences between samples, can be mentally taxing as the brain eventually struggles to retain an impression of the compositions that have been encountered so far. It is therefore useful to repeat the process, by noting down the groups that have been created and re-examining them afresh after a break away from the microscope (Quinn 2013: 73-79)[39].

The relative abundance of the inclusions, clay matrix and voids should first be determined before each of these three components can be described in detail. This can be calculated with relative accuracy by means of point counting or automated image analysis. The provenance of an artefact such as a ceramic sherd from an oil lamp or a pottery container refers to the location in which it was produced or manufactured. The terms provenance and 'provenience' are sometimes used interchangeably. The movement of pottery from their production location to their find spot is related to a range of different human activities such as trade, exchange, distribution, migration and group mobility (Santacreu 2014:1-). Ceramic compositional analyses and traditional (typological) approaches both seek to define geographic patterning in ceramic assemblages and use this to track the movement of artefacts from one place to another, with the aim to relate paste with the geological environment.

Therefore, thin section petrography is well suited to the interpretation of ceramic provenance in that it is concerned with the geological characterization of ceramic artefacts and the nature of their raw materials. The potential of thin section petrography for provenance determination was responsible for the initial application of the technique to archaeological ceramics studies and its rapid growth in the latter part of last century. Indeed, provenance attribution remains the most common goal in petrographic studies of archaeological ceramics. It is worth remembering, however, that the two aims of ceramic petrography - the determination of provenance and the reconstruction of technology - are interrelated; in addition the technological criteria can provide important data for the interpretation of pottery provenance (Quinn 2013:117).

In this sense, paste analysis is essential for the study of archaeological pottery. This analyses can be performed through different strategies that have diverse scale, accuracy, precision, complexity and sophistication. We can roughly distinguish between macroscopic and microscopic

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[39] At this point I would like to thanks Prof. Yuval Goren from Tel Aviv University, IL, fo all the time spend with me in the Laboratory and supervision of this research. Also Dr Kamal Badreshany for his time and advices during my stay at Durham University, UK.

(or archaeometric) analysis. Although in practice both types of approaches are usually combined. A brief evaluation here of the basic fundaments of petrographic, textural and micropaleontological analysis used on this research will help explain the following experiments. In essence, the petrographic study of ceramics provides information on the structure of the ceramic fabric and petrographic composition of samples, which allows us to study the minerals and rock fragments present in the ceramic samples through certain optical attributes. These parameters are studied in order to characterize the microstructure of the clay matrix, organic constituents, inorganic components of biological origin, anthropogenic components and the morphology of the components present in the coarse fraction of the samples (e.g. texture, porosity, orientation, frequency). The determination of specific taxonomic categories and their particular composition, origin and technology allows the distinction between these categories, which in turn permit us the determination of petrofabrics or petrogroups. The characterization of the clay matrix and fabric microstructure within the ceramic groups are studied through optical methods, or Optical Mineralogy (e.g. Banning 2005; Bishop, Rands and Holley 1982; Freestone 1995; Garrison 2003; Gribble and Hall 1985; Goren, Finkelstein and Na'aman 2004; Mackenzie and Guildford 1980; Mackenzie and Adams 1994; Middleton 1985, 1991; Nesse 1991; Peterson, 2009; Porat 1988; Quinn, 2013; Reedy 2008; Riederer 2004; Stoltman, 2001; Tite 2008; Whitbread1995; 1989).

The percentage of fine and coarse fractions occurring in the paste, especially its inclusions and tempers, provide textural parameters and characterization of the granulometry of the fabric. Thus, textural analysis refers to characterization of frequency, grain size, particle shape, sorting and roundness with the aim to establish textural differences between ceramics that exhibit analogous or differences mineralogical composition. Variations in particle size, shape and proportion of the non-plastic components may help to group the samples that were produced using very similar materials and establish technological features in pottery containers related to techniques. The sorting degree of non-plastic components and their grain size distribution are key variables in textural analysis. In order to identify several human actions involved in paste preparation and clay procurement, the determination of textural parameters has become one of the bases in the characterization of clay raw materials and archaeological ceramics. Thus, it is usual to perform granulometric studies through thin section analysis (Orton et al., 1993; Rice, 1987; Velde and Druc, 1999).

Macroscopic analysis in combination with a binocular microscope with magnifications up to 60x is an effective method for conducting the systematic classification of fabric, since it allows for

the analysis of some qualitative features related to the texture and matrix structure of the artefacts. Several procedures can be used to determine the texture in pottery analyses, all of them have some advantages and disadvantages, according to different levels of sample preparation, research skills and training, and material and human resources. The texture of ceramics has most commonly been studied through qualitative comparative tables developed from sedimentological studies or using semi-quantitative approaches, that is, traditional point counting for each thin-section sample. Measuring 50 grains is enough to obtain an acceptable estimation of the texture, but a more meaningful result will be obtained when over 200 individuals can be measured (Middleton et al 1985, 1991; Santacreu 2014).

The recent introduction of digital image analysis for ceramic texture studies follows the development of computer sciences in the last decades, and has led to more accurate ways of tackling measurements and analysis. Today, grain point counting can be systematically performed using digital image analysis, allowing for more accurate data and comparisons in quantitative terms. The amount, dimensions of the organic matter, and morphology of the pores can be estimated, as well as a precise numerical description of the size, shape, coloor and position of grains (among other parameters) recorded in an image of the sample (Reedy 2003; 20008; Reedy e Kamboj 2003; Reedy et al 2014; Velde and Druc, 1999).

The study of the origin of the microfossils – micropaleontological analysis – along with textural and petrographic analyses is a valuable complementary procedure for identifying the mixture of clays in the paste as microfossils tend to occur in distinctive clay deposits and sedimentary environments. The characterization of these organisms in thin section is based on several parameters such as their shape, size, mineralogy, microstructure and chamber arrangement (Flügel, 2004; Tucker, 1991). This micropalaentological information provides parameters for classifying the foraminifera in terms of families, genera and species. The main objective in this study is to identify microfossils that were present in the sediments used to produce the oil lamps. Therefore, these microfossils are indicative of the depositin environment of the sediments in each geological period.

Foraminifera are a free-ling marine amoeboid protzoa. They are single-celled eukaryotes and exhibit annal-like behaviour. They secrete an elaborate solid carbonated skeleton that contains the bulk of the cell. The foraminiferal skeleton is divided into a series of chambers, which increase in number during growth (BouDagher-Fadel 2013: 1-29). In life they exhibit extra-skeletal

pseudopodia, temporary organic projections, and web-like filaments that can be granular, branched and fused (rhizopodia), or pencil-shaped and pointed (filopodia). Foraminifera first appeared in the Cambrian, over the course of the Phanerozoic and invade most marginal to fully marine environments. The wide variety of niches include planktonic forms from the Late Traissic or Jurassic (Noujaim Clark and Boudagher-Fadel 2001: 215-232; 2004: 477-504; BouDagher-Fadel and Noujaim Clark 2006: 81-118).

The presence of certain species and families is associated with different depths, temperature, salinity, substrates, levels of activity and geological age, the latter of which has particular depositional dynamics depending on specific climate and geomorphological conditions. Often microfossils such as ostracods, echinoids, bivalves, or foraminifera can be found in thin sections as part of the inclusions, forming sedimentary rock fragments or within the clay matrix . Typically the skeletons of foraminifera from sedimentary environments are formed by calcium carbonate and decompose at low temperatures (Santacreu 2014: 38-39). However, in some case when the ceramics reach high temperatures in the firing process, the morphology of the microfossils is seriously affected making accurate identification impossible. In these conditions, it is only possible to indicate the presence or absence of these organisms in the clay and classify the fabric according to their unfossiliferous or fossiliferous character. When microfossils lose their architectural structure because were thermally altered and they cannot be optimally classified (family, genus and species), they are commonly called “ghosts” (Quinn 2013). In short, microfossil identification permits us to confirm that the clays analysed are related or not to specific geological deposits.

Finally, these methodological approaches (petrographic, textural and micropaleontological analysis) were chosen to help the study of the manufacturing processes and for detecting the origin of clays of the Roman oil lamps discussed in this research. They will also allow for new questions to be asked of the role played by these lamps in the Roman world and patterns of consumption and usage, as well as continuities and ruptures in relation to the style and agency of these objects and their production.

5. Representative Sampling and Site Selection

Sites were selected on the baisis of their usefulness for investigating modes of trade, markets, and socioeconomic relations in these locales, interregional and intraregional, urban-rural and interethnic trade. Clay oil lamps were selected from old excavations in Syria and North Africa and clay lamps stored in the Israel Antiquities Authority at Beth Shemesh. These materials are well contextualised and the sampling of materials did not cause any problems for later restorations or studies, but instead has made it possible to incorporate and update these artefacts into current research.

The sample selection criteria were chosen for obtaining archaeological information related to different archaeological sites (and archaeological contexts by consequence) in order to carry out synchronic and diachronic approaches to the characteristics of the pottery assemblage under analysis. These sites have roughly the same chronologies, with slight differences in the occupation levels and stratigraphic sequences. This chronological strategy allows us to approach changes and maintenance of features at the synchronic and diachronic levels in the same period, but in different regions and sites. Significant care was taken to ensure a representative sampling of oil lamps from a number of different contextual sites.

Time and space were the key focus, to allow an analysis of the way ceramic production and the different functions of the lamps related to specific chronological periods. The macro and micro-spatial distribution of these artefacts was also studied and related to ceramic technologies and social practices.

In order to accurately contextualize the lamps and interpret pottery technology and social practice, a critical study of the relationships that existed between oil lamps and the rest of the material culture with which it is associated was undertaken. Such as study provides information on the associations between shapes and types, procedures and behaviours. In the end, the representativeness of the sampling strategy was limited by the decisions of the museum curators and the techniques and procedures available in the laboratories used, as well as by the homogeneity of the pastes (Santacreu 2014:8-10). Indeed, no analysis of a ceramic sherd is 100% representative of the paste composition of the whole container and it is important to be aware of the limitations and

advantages related of the compositional characterization and the methods applied in the research (Bishop et al 1990).

Types x context	Contagem de Tipos por Contexto											
Types	Boat/ Barco	Building/ Edificações	Burial/ Enterramento	Church/ Igreja	Cistern/ Cisterna	Excavations/ Escavação	Mithraeum/ Mitreu	No context information/ Sem Informações de Contexto	Synagogue/ Sinagoga	Theatre/ Teatro	Therma/ Terma	Total Geral
R1		1	1			1		3				6
R1a			8			3		5				16
R1B			4					1				5
R2			2					3				5
R3			1			3		4				8
R4			3			8		6		5		22
R5			1					3				4
R6						1		1				2
R7			1									1
R8			1									1
R8A			1									1
R8B			1					2				3
R9			4			1		8				13
R9A								1				1
R10			4			3		7				14
R10B						4		3				7
R11								1				1
R12			2					11				13
R13			3					2				5
R13A			1									1
R14			2									2
R15			3			1		1				5
R16			3									3
R17			51			4		6	4			65
R18			1					2				3
R19			3	1		2		2				8
R20			6									6
R20-R28			2									2
R21			1									1
R22			14			4						18
R23			1			4						5
R24			40					5				45
R24			4			1		1		1		7
R24-R28			19		1	2		3	1			26
R25						1		2				3
R26			118			41		46		3	1	209
R27			20			1		3				24
R28			14					2		1		17
R29			47		1	6	1	3	1			59
RW1			5									5
RW1.2						1		1				2
RW1.3	1		10			1		1				13
RW3			1			2						3
RWH3			124		1	14		20	3			162
RH			1									1
RH4			12			2						14
RH5			1					1	1			3
RH6			28					1	1			30
RH7			11			3		5				19
RH8			15					2				17
RH9			5					8				13
RH10						2		6				8
RH11			16					56				72
RH20			1									1
-		1	18		1	2		6	1	1		30
Total Geral	1	2	635	1	4	118	1	244	12	11	1	1030

Fig. 22. Table of 1030 small lamps stored in the Israel Antiquities Authority (IAA) organized by type and context.

From a total of some 1030 lamps stored in the Israel Antiquity Authority (Sussman 2012), 89 sherds from 19 sites were sampled in Israel. A further 114 lamps were sampled from Dibij Faraj (Syria) and Carthage (North Africa). Thin sections of all these clay lamps were made either at the

Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel Aviv University, and at Durham Archaeomateials Research Centre, Durham University, United Kingdom.

The follow section shows the number of clay lamps *per* type (Sussman typology) and the context, in order to provide an overall impression of the assemblage of Roman-period clay lamps. A general description and information about each particular clay lamp sampled is also provided and each lamp's petrographic attribution can be found in the (Appendix II) 'Fabric and Petrographic Descriptions of Samples'.

1. Sasa, Alta Galiléia, Norte (236999 – 237999/770000 – 771000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 1.	254	74-2098 (375)	Sepultamento em caverna, Tumba X	Basket 7 1E+10	R24	1st-2nd EC
TB 2.	X	74-2099	Sepultamento em caverna, Tumba X	Basket 7 1E+10	R24	1st-2nd EC
TB 3.	X	74-2100 (367)	Sepultamento em caverna, Tumba X	Basket 8 1E+10	R26	1st-2nd EC
TB 4.	256*	74-2101 (370)	Sepultamento em caverna, Tumba X	Basket 9 1E+10	R24	1st-2nd EC
TB 5.	255*	74-2102 (371)	Sepultamento em caverna, Tumba X	Basket 10 1E+10	R24	1st-2nd EC

2. Nahariyya, Galiléia Ocidental, Norte (228000 – 229000/734000 – 735000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 6.	220	64-505 (379)	Sepultamento em Giva'at Katzenelson (2427/0) Tumba I-נ	Basket 36 1E+10	R19	3rd -4th EC
TB 7.	449	66-634 (386)	Sepultamento em Giva'at Katzenelson (2427/0)	1E+10	R26	1st -3rd EC
TB 8.	450	70-1235 (383)	Sepultamento em Giva'at Katzenelson (2427/0) Tumba H	Basket 4 1E+10	R26	1st-2nd EC
TB 9.	309	70-1241 (384)	Sepultamento em Giva'at Katzenelson (2427/0) Tumba +	Basket A9 הרעמ	R26	2nd -3rd EC

3. Cesareia Marítima, Planície do Sharon, Planície Costeira (1894000 – 191200 / 710000 – 713000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 10.	456	1972-186 (434)	H. Qesari, Cidade (1338/0) Area A-3-3.1	Locus 3073 1E+10	R26	1st -3rd EC
TB 11.	421	1972-190 (433)	H. Qesari, Cidade (1338/0) Area A-4-77 (A-1)	Locus 9104 1E+10	R26	1st -2nd EC
TB 12.	475	1973-253 (431)	H. Qesari, Cidade (1338/0) Area C-8-92 (A-12)	Locus 6408 1E+10	R26	1st-3rd EC
TB 13.	-	02-2142 (116)	H. Qesari, Cidade (1338/0) City, Area KK28	Locus 85, Basket 208 1E+10	R26	2nd -3rd EC
TB 14.	-	555216 (115) /1094	H. Qesari, Cidade (1338/0) Area CC14	Locus 12, Basket 29 1E+10	R26	2nd -3rd EC

4. Appolonia, Sul do Sharon, Planície Central Costeira (181699-182499 / 677500-678300).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 15.	X	Apollonia8699 AP III	*villa maritima* ou *mansus*.	locus 8699.	R26	1st -3rd EC
TB 16.	X	Apollonia2017 APII6/92	*villa maritima* ou *mansus*.	locus Área de Descarte	R26	1st -3rd EC
TB 17.	X	Apollonia2035 APII	*villa maritima* ou *mansus*.	locus 1859, corredor leste.	R26	1st -3rd EC
TB 18.	X	Apollonia2036 APII	*villa maritima* ou *mansus*.	locus 1859, corredor leste.	R26	1st -3rd EC
TB 19.	X	Apollonia2040 APII	*villa maritima* ou *mansus*.	locus 1937, *culina* - cozinha	R26	1st -3rd EC
TB 20.	X	Apollonia2041 APII	*villa maritima* ou *mansus*.	locus 1937, *culina* - cozinha	R26	1st -3rd EC
TB 21.	X	Apollonia2042 APII	*villa maritima* ou *mansus*.	locus 8002	R26	1st -3rd EC
TB 22.	X	Apollonia2043 APII	*villa maritima* ou *mansus*.	locus 1937, *culina* - cozinha	R26	1st -3rd EC

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 23.	X	Apollonia2044 AP IX/92	*villa maritima* ou *mansus*.	locus 1937, *culina* - cozinha	R26	1st -3rd EC
TB 23.	X	Apollonia2046 AP IX/92	*villa maritima* ou *mansus*.	locus 1937, *culina* - cozinha	R26	1st -3rd EC
TB 25.	X	Apollonia2106 AP IX/92	*villa maritima* ou *mansus*.	locus 1937 culina, 1225 – Rom.1.	R26	1st -3rd EC
TB 26.	X	Apollonia2117 APII	*villa maritima* ou *mansus*.	locus 1928 sala norte	R26	1st -3rd EC
TB 27.	X	Apollonia2148 APII6/92	*villa maritima* ou *mansus*.	locus 1342, sala norte, 1297 – Rom.1.	R26	1st -3rd EC
TB 28.	X	Apollonia2150 AP IX/92	*villa maritima* ou *mansus*	locus 1768, fim do longo corredor.	R26	1st -3rd EC
TB 29.	X	Apollonia2153 AP IX/92	*villa maritima* ou *mansus*	locus 1851, início do longo corredor.	R26	1st -3rd EC
TB 30.	X	Apollonia2227 APII6/92	*villa maritima* ou *mansus*	locus 1342, sala norte, 1297 – Rom.1	R26	1st -3rd EC
TB 31.	X	Apollonia2749 AP IX/92	*villa maritima* ou *mansus*	locus 1851, início do longo corredor.	R26	1st -3rd EC
TB 32.	X	Apollonia2750 AP IX/92	*villa maritima* ou *mansus*	locus 1342, sala norte, 1297 – Rom.1.	R26	1st -3rd EC
TB 33.	X	Apollonia2774 APII6/92	*villa maritima* ou *mansus*	locus 1768, fim do longo corredor.	R26	1st -3rd EC
TB 34.	X	Apollonia2775 AP IX/92	*villa maritima* ou *mansus*	locus 1851, início do longo corredor.	R26	1st -3rd EC

5. Yafo, Sul do Sharon, Planície Central Costeira (176000-177400 / 661500-6629000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 35.	X	B488/2	Tumba Yafo (823/0) 2085	Basket 488/2	R24-R28	1st -3rd EC
TB 36.	X	718118-פ / B1727 (944)	Tumba Yafo (823/0) 2085	Locus 143, Basket 1727	R24-R28	1st -2nd EC
TB 37.	X	718117-פ B6143 (943)	Tumba Yafo (823/0) 2085	Locus 619, Basket 6143	R24	2nd -3rd EC

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 38.	X	B7494	Tumba Yafo (823/0) 2085	Basket 7494	R24-R29	2nd-3rd EC
TB 39.	X	718077-פ B1434 (942)	Tumba Yafo (823/0) 2085	Locus 46, Basket 1434	R24-29	2nd -3rd EC

6. Ginegar - Ginoshar, Mar (Lagoa) da Gailélia (19760-25070 / 19805-251300).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 40.	X	1998-426 (693)	Sepultamento Ginnegar (2990/0)	Locus 5, Basket 50 1E+10	R26	2nd -3rd EC
TB 41.	X	1998-424 (692)	Sepultamento Ginnegar (2990/0)	Locus 2, Basket 39 1E+10	R26	2nd -3rd EC

7. Séforis - Tzippori (Diocesareia), Baixa Galiléia, Norte (185000-186000/623000-624000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 42.	X	1998-4038 (782)	Séforis cidade (3039/0) Locus 501	Basket 1021 1E+10	R26	1st-2nd EC (70-135)
TB 43.	X	1998-4039 (783)	Séforis cidade (3039/0) Locus 501	Basket 1022 1E+10	R26	1st-2nd EC (70-135)
TB 44.	X	1998-4040 (784)	Séforis cidade (3039/0) Locus 211	Basket 1033 1E+10	R26	1st-2nd EC (70-135)
TB 45.	X	98-426	Séforis cidade (3039/0)	X	R26	2nd -3rd EC

8. Tiv'on, Baixa Galiléia, Vale de Zebulon, Norte (212000 – 213000 / 736000 -737000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 46.	416	72-461 (138)	Sepultamento em caverna em Tiv'on (2501/0) Tumba 12	21 1E+10	R26	1st -2nd EC
TB 47.	334	72-462 (140)	Sepultamento em caverna em Tiv'on (2501/0) Tumba 91	19 S-5318	R26	1st -3rd EC
TB 48.	417	72-463 (137)	Sepultamento em caverna em Tiv'on (2501/0) Tumba 55	56 1E+10	R26	1st -2nd EC
TB 49.	266	72-464 (136)	Sepultamento em caverna em Tiv'on (2501/0) Tumba 52	25 1E+10	R24	1st -2nd EC
TB 50.	267	72-466 (135)	Sepultamento em caverna em Tiv'on (2501/0) Tumba 22	22 1E+10	R24	1st -2nd EC

9. Geva - Mishamar Ha-E'meq, Baixa Galiléia, V. Zebulon (181599-181749/672550-672700).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 51.	227	83-63 (396)	Sepultameno em Tel Shush Mishmar ha-`Emeq (2539/0)	School (Basket -522) 1E+10	R20	1st -2nd EC
TB 52.	336	83-69 (398)	Burial, Tel Shush Mishmar ha-`Emeq (2539/0)	Amir 1E+10	R26	1st -3rd EC
TB 53.	-	83-70 (399)	Burial, Tel Shush Mishmar ha-`Emeq (2539/0)	Amir 1E+10	R26	1st -3rd EC
TB 54.	600	83-94 (400)	Superfície	Vinícula 1E+10	R24-28	1st -3rd EC

10. Bet She'an, Vale de Jizreel, Sul Baixa Galiléia, Norte (246000 – 249000 / 711000 – 713000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 55.	X	248-18	X	X	R26	1st -3rd EC
TB 56.	X	248-55	X	X	R26	1st -3rd EC
TB 57.	X	248-57	X	X	R26	1st -3rd EC
TB 58.	X	68.161	X	X	R26	1st -3rd EC
TB 59.	X	74-1181	Sepultamento	Bet Alfa	R26	1st -3rd EC
TB 60.	X	1961-985 /552/ (168)	Theatre (3537/20)	Locus 8B, Basket 388, M-347	R24-29	2nd -3rd EC

11. Jerusalém, Judéia - Jerusalem Western Wall (17226:13135/ 17259:13153).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 61.	X	89-1442 (192)	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Locus 4306, Basket 2648 1E +10	R26	2nd-3rd EC
TB 62.	X	89-1443 (193)	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Locus 107, Basket 4174 1E+10	R26	2nd-3rd EC
TB 63.	X	89-1446 (195)	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Locus 1106, Basket 4116 1E+10	R24	1st -2nd EC
TB 64.	X	89-1447 (196)	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Locus 73א, Basket 60840 1E+10	R26	1st -2nd EC
TB 65.	X	89-1448 (197)	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Locus 5621א, Basket 17003 1E+10	R26	1st -2nd EC
TB 66.	X	3030/ור 2504	Muro da cidade velha, parte Sul e Oeste. (2921/212)	Escavações Muro Area VII Locus 6032, Basket 3030	R26	1st -3rd EC

12. Bet Guvrim - Maresha, Judéia, Sopé das montanhas (190000 – 191000 / 611000 - 612000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 67.	X	1962-505 (336)	Sepultamento Tumba C רבק, השארמ C ‘’C1	Basket 133 1E+10	R24	1st -2nd EC
TB 68.	X	1962-506 (342)	Sepultamento Tumba C רבק, השארמ C ‘’C1	Basket 113 1E+10	X	1st -2nd EC
TB 69.	464	1962-508 (343)	Sepultamento Tumba C רבק, השארמ C ‘’C152	Basket 152 1E+10	R26	1st -3rd EC
TB 70.	431	1962-513 (335)	Sepultamento Tumba C רבק, השארמ C ‘’C	Basket 137 1E+10	R26	1st - 2nd EC
TB 71.	398	1962-515 (344)	Sepultamento Tumba C רבק, השארמ C ‘’C138	Basket 138 1E+10	R26	1st – 2nd EC

13. Tel Goded, Judéia, Sopé das montanhas (190000 – 191000 / 611000 - 612000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 72.	X	9281 6.1.4/88	X	X	X	X
TB 73.	X	1996-1905 (497)	דדוג'רח	1E+10	R26	2nd -3rd EC
TB 74.	X	1998-631 (697)	Tumba 4 Moreshet Gat, T. (1369/0)	Basket Jul-71 1E+10	R26	2nd -3rd EC

14. Ramon, Judéia, Sopé das montanhas (18700 – 188000 / 58600 – 587000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 75.	X	1984-211 (356)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	R26	1st-3rd EC

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 76.	350	1984-215 (355)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	R26	1st-3rd EC
TB 77.	X	1984-227 (x)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	X	X
TB 78.	X	1984-244 (x)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	X	X
TB 79.	625	1984-315 (356)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	R24-28	1st-3rd EC
TB 80.	441	1984-213 (357)	H. Remalya Tumba 4 (1160/0) מערה	Sepultamento caverna	R26	1st-3rd EC

15. Moa, Araba, Sul (215200 – 215700 / 494450 – 494850).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 81.	X	02-3555 1981-808 (221)	Moa (2513/0)	Basket 813	R26	1st-3rd EC

16. Shomrom, Samaria (217000-218000/686000-687000).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 82.	X	1932-2359 (610)	Shomron (2757/0) Área B	Locus 361	R26	2nd -3rd EC
TB 83.	X	1932-2291	Área 440241032803	Stratum 1	R29	3rd-4th EC
TB 84.	X	1933-2161	Área 440241032803	Stratum 1 E222N	R2	1st EC
TB 85.	X	1932-2339 (609)	Shomron (2757/0) Área D	Stratum 1 D923 DG, Basket 329 4.4E+11	R26	2nd -3rd EC

17. Siquém-Shechem (Neapolis), Samaria (1748-1800/1766-1813).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 86.	472	1943.266	Sepultamento caverna	Câmara 1	R26	1st-3rd EC
TB 87.	374	1943.262	Sepultamento caverna	Sala 1	R26	1st-3rd EC
TB 88.	X	1943.264	Sepultamento caverna	Câmara 1	R29	3rd-4th EC
TB 89.	479	41-1137	Sepultamento	Talusa	R26	1st -3rd EC

18. Cartago, Tunísia, Norte da África (3651-1943 / 1022-0687).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 90.	X	1985	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	Deneuve type Vb	4th-5th EC
TB 91.	X	18019	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R26	3rd EC
TB 92.	X	20024A	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R1 or R2	1st-3rd EC
TB 93.	X	20024B	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R26	1st-3rd EC
TB 94.	X	20024C	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R1 or R2	1st-3rd EC
TB 95.	X	20024D	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R18	2nd -3rd EC
TB 96.	X	20024E	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R26	1st -3rd EC
Tb 97.	X	20024F	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R26	1st -3rd EC
TB 98.	X	21003	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	Deneuve type VIIIb	4th-5th EC
Tb 99.	X	GL001	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R13	1st – 2nd EC

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 100.	X	GL025	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R20	1st -3rd EC
TB 101.	X	GL40	Cemitério de Cartago, Tunisia, escavações 1982-83	Muro dos fundos do Circus	R20	1st -3rd EC

19. Dibsi Faraj, Syria (3554-5766 / 3813-5776).

Amostra	Registro Sussman (2012)	Registro IAA	Contexto	Localização no sítio	Tipo	Data
TB 102.	X	1	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 103.	X	3	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 104.	X	4	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 105.	X	4.1	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 106.	X	5	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 107.	X	6	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 108.	X	8	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
Tb 109.	X	9	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 110.	X	10	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 111.	X	11	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 112.	X	13	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB 113.	X	14	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC
TB114.	X	15	Citadel basilica	Excavation 1971-1974	X	1st -3rd EC

6 - Petrographic, textural and micro paleontological analysis

"Everyone knows that social sciences are hypercomplex. They are inherently far more difficult than physics and chemistry, and as a result they, not seem easier because we can talk with other human beings but not with photons, gluons, and sulfide radicals" (Wilson 1998:183)

Petrography is based on crystal chemistry and crystal symmetry of minerals which are crystalline. Thin-sections analysis allows for the identification and description of the texture, grain orientations, size, shape, sorting, roundness and sphericity (size, shape and orientation of voids), state of alteration of minerals, their associations and relative abundance, also firing temperature and relative proportions of different minerals in a sample.

This work follows standard procedures (Bishop, Rands and Holley 1982; Goren, 1996; Goren, Finkelstein and Na'aman 2004; Peacock, 1977; Porat 1989; Whitbread 1995). A powdered sample of the oil lamps was taken by drilling with a titanium drill bit or, alternatively, by breaking off a slice of the oil lamps under investigation. The slices were impregnated with Buehler EpoThin epoxy resin in a vacuum and allowed to cure for nine hours. Samples were polished on a Buehler Metaserv grinding machine and affixed to glass slides with Buehler EpoThin epoxy resin. The Bueller PetroThin Thin Sectioning System was used to grind the samples to a standard thickness of 30µm. in a thin transparent section (**fig. 12**). The size of a sample was commonly defined by the need to include a recognizable amount of inclusions (at least 10x5 mm), which is the nonplastic component of the clay or matrix in petrographic terms (Goren et al 2004:11). The slides were covered with microscope cover glass. The sections were vertical to the lamp. Samples need to be mounted and polished to obtain a thickness of 30µm, which allows the light to go through the different minerals. Thus, it is possible to observe how the light interacts with the crystals and establish several features for mineral identification (Quinn, 2013). The samples were examined and described under a Zeiss Axiolab-POL polarising microscope in the Laboratory for Comparative Microarchaeology at the Institute of Archaeology, Tel Aviv University, and under a Nikon Eclipse LV100 polarizing microscope equipped with a Nikon DS Fi1 digital camera for the analysis in the Durham Archaeomaterials Research Centre (DARC)[40], at Durham University. In assigning a

[40] http://www.darclab.com/

provenance to ceramic artefacts, it is important to define what is understood by the concept 'fabric' and 'matrix'.

The term fabric has been defined as the material that ceramics are made of or to denote a group of samples that show similar properties. However, it is more commonly used to refer to the 'arrangement, size, shape, frequency and composition of components of the ceramic material' (Peacock 1970; Whitbread 1986:368). Thus, defining the quantity of the fine component in a fabric depends both on the requirements of the potter and the nature of the raw materials. As FitzPatrick hints (1984:135), the matrix can be considered a more or less continuous phase that encloses coarse material, concretions, and generally relates to a material of less than 2µm. In Petrographic terms, 'structure' may be used to refer to the arrangement of voids, depletion and concentration features, micromass across and within these units of fabrication and the coarse material. To include coarser material in the definition of the matrix is important because a bimodal grain-size frequency (the finer may be regarded as constituting the matrix) can often be found in ceramic fabrics (Whitbread 1986: 369-371).

The sections were examined with a petrographic microscope where the prepared samples were fixed on a horizontal plane and manipulated by rotating it through 360 degrees. The petrographic microscope provides plane and crossed polarized light and convergent light. Two convergent lenses (the objective and ocular) by polarization directions (or vibration) perpendicular to each other. The *polarizing lens* constrains light to vibrate only in the north-south direction, and above the object under study a second polarizer, the *analyzing lens*, constrains light to vibrate only east-west. The analyzer can be moved in or out of position, but the substage polarizing lens is fixed in place.

The images of minerals are formed on the back of the lens of the objective with convergent illumination. A Mineral is defined as a natural body occurring in solid inorganic substances with crystalline form characteristics ordered through the interaction of physical and chemical processes in geological environments. The most diagnostic optical property of minerals is their refractive indices. The polarized light allows the identification of the anisotropic minerals present in the samples. Different ways of modifying the light transmission leads to other interactions with the sample to further help identification. Coloor and orientation patterns of the matrix were identified and described according to Bullock et al. (1985). The minerals in the silt and the temper were identified and their frequency, sorting, shape and roundness were described with the aid of visual

charts (FitzPatrick 1980; Bullock et al. 1985). Temper, therefore, was defined as non-plastic coarse (larger than 62 μm) particles added by a potter. But it must be remembered that tempers can occur naturally in the clay.

Light patterns are commonly produced in different coloors known as interference figures. The optical properties of anisotropic minerals produce characteristic colours which contrast in varied directions; a beam of light can split into two beams according to their inherent vibration directions with different velocities. In opposition to the isotropic minerals, which have physical properties in all directions, the anisotropic minerals have a 'fast' and a 'slow' beam of light. When combined with the colour of crystals viewed through ordinary transmitted light an analysis of its birefringence characteristics are possible. This same effect can be found on other glass screens such as for instance the effect of sun light on glass windows. The observed colours are due to the differences between the smallest and largest refractive indices. A refractive index can measure when the refraction of light passes through the crystal, a ratio of the velocity of light in the air to its velocity in the mineral (Herderson 2000: 11-12).

Minerals with higher a birefringence appear to be an opalescent colour while those minerals with low birefringence appear grey or yellow under crossed nicols. Those minerals which have iron and chromium naturally appear brown, pink, light blue or green because they contain sufficient levels of colorants. These colours are the result of the way in which light is altered as it passes through the atomic arrangements of mineral crystals, or the crystalline lattices.

One of first concerns of any ceramic petrologist is to determine in which way the materials under analysis differ from natural sediments and how the requirements of the analysed data contrast with those of sedimentary petrologists. Despite the fact that Ceramic Petrography has derived much of its methodology from Sedimentary Petrology, the most fundamental difference between them is that ceramics are clay and sand – essentially sediments – that have been selected and transformed into pottery through a technological agency process rather than through natural processes, (Whitbread 1995:366). Determining whether a temper was added to the preparation of paste entails combining the amount and angularity of the non-plastic inclusions with the grain size distribution. The grain size distribution of a mineral (or crushed rock) may be unimodal, bimodal, polymodal or a seriated texture within the coarse fraction of the paste. These terms are crucial for identifying the presence of tempers in the paste and refer to the coarse fraction that has a wide range of grain sizes that grade into each other (Velde, 2005). Usually if the texture is considered bimodal that is proof

that sediments were mixed into the paste deliberately. Therefore, the technological and agency processes are essential and primary concerns for ceramic petrologists.

There are many systematic mineralogy books that can be consulted for information on minerals, and the literature on Archaeomineralogy is huge, especially about the mineral descriptions of rock artefacts and thousands of excavation reports. For this reason the same mineral could have a variety of names and synonyms.. The names given for many minerals have changed over time (cf. Rapp 2009). The non-plastic inclusions (any solid gritty material that may naturally occur within the clay or be intentionally added by the potters) play an important role in the analysis of the clay's formation and utilization (see Shepard 1965:24-54; Rice 1987: 72-75; Goren et al 2004:7-8).

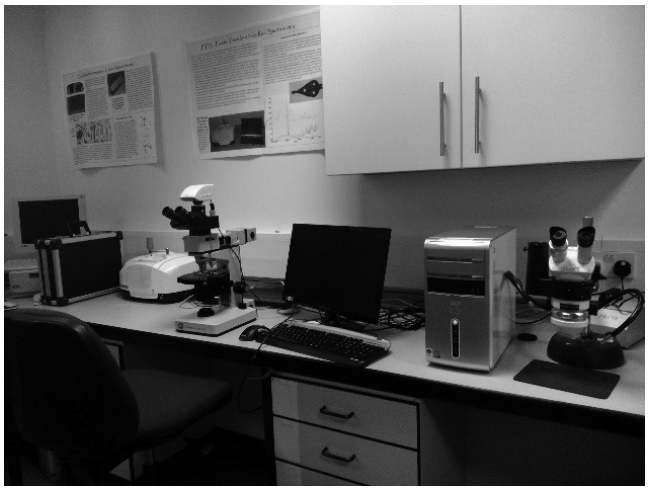


Fig. 23. Durham Archaeomaterials Research Centre (DARC), Durham University, UK.

Descriptions were carried out to identify and characterise the minerals, by switching between PPL and XPL and rotating the stage from low to medium magnifications (c.x25-100). The observation in both plane polarised light and cross polarised light was performed using certain parameters such as crystal habit, cleavage, colour, pleochroism, index of refraction, relief, birefringence, interference colours, zoning, extinction angle, which allowed the petrographic description of the components present in the samples. Consequently, parameters such as the polymineralic and polycrystalline character of each type of mineral, the rock identification, angularity, shape and grain-size were recorded. These characteristics of the clay are crucial for

recognizing whether intentionally crushed tempers were added or were naturally occurring in the paste. The combination of automatic methods, such as image analysis, with the petrographic microscope enabled the textural analysis of the thin sections and the establishment of petrographic groups.

A petrographic analysis should include the basic characteristics of the matrix such as calcareous or non-calcareous nature, presence of microfossils, colour, isotropic or non-isotropic character, type of birefringent fabric; and the amorphous components which occur in the matrix. Through petrographic observation pastes can be related to finer or coarser fabrics depending on the size of their non-plastic components. The petrological sorting will depend on the types of rocks, such as igneous, metamorphic and sedimentary, and the minerals detected in the samples, such as quartz, feldspars, micas, calcite, etc.

The different sizes of the minerals and rock fragments present depends on the kind of mineral, and whether a more intense erosive process took place, resulting in greater particle roundness and the angularity of the grains (e.g. angular, sub-angular, sub-rounded and rounded). This information is related to the degree of alteration and weathering that the different mineral grains have suffered due to erosive processes (i.e. angularity and roundness of particles). The distribution of grains can be unimodal, bimodal or polymodal and well or poorly sorted. In qualitative terms grains can be absent, rare, few, common, frequent and dominant (Whitbread, 1995). Paste can be classified as dense, fine-grained, small-grained, medium-grained, or coarse-grained in relation to the texture. If is over 0.1 mm it is dense, between 0.1-0.33 mm it can be classified as fine-grained, from 1 to 3.3 mm is medium-grained and up to 3.3 mm is considered coarse-grained. Fabrics that contain at least 90% of the grains of the same size are well sorted, while those that have a mixture of different sizes roughly in similar proportions are considered poorly sorted (Riederer 2004; Santacreu 2014).

All these parameters were used to assess distribution patterns and changes in the ceramic assemblages, thus enabling a comparative analysis of the data and the determination of petrogroups or petrofrabrics. Features of the raw materials were used as reference indicators of the possible clay procurement source in order to compare with the geological deposits of the region that were closest or not to the archaeological sites where the oil lamps were found. Information on the coarse fraction of the paste to identify mineral and rich fragments present, as well as possible concentrations of textural feature occurring in paste are described and organized in Appendix III. The analysis of the

microstructure of the matrix and the coarse fraction permitted the determination of specific petrofabrics.

Rather than just describing each sample individually, the petrographic analysis performed classifies the samples into petrofabrics based on their petrological features. The classification system must remain flexible to allow for internal variability. In this regard, automatic categorical groupings allow for the statistical analysis of the data, more accurate sorting of the samples and a qualitative procedure that creates a better connection between the samples. In any case, fabric studies can provide key information regarding the decomposition or the alteration of certain inclusions or tempers, technological actions related to forming methods and surface treatments, and the way the firing process affected the pottery (e.g. the transformation of calcite to diopside or the presence of thermal alterations in spathic calcite crystals). In this sense, an anisotropic and birefringent matrix indicates that the clay minerals preserve their crystalline structure, while an isotropic matrix with no birefringence evidence refers to vitrified ceramic fabrics fired at high temperatures, since the vitrification process starts at about 850^0 C.

In short, petrofabrics are taxonomic categories that distinguish between ceramic groups depending on their particular composition, technology and origin. Therefore, the description of the petrographic composition should entail consensus among researchers and previous studies on the region, in order to establish groups that are comprehensible and comparable with other ceramic records. Thus, the lithology of the thin-sections was compared to geological maps (Sneh, Bartov and Rosensaft 1998). Finally, the samples were divided into fabric groups on the basis of their mineralogical affinities in both clay and temper, and then compared with thin-sections from the collection in the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel Aviv University.

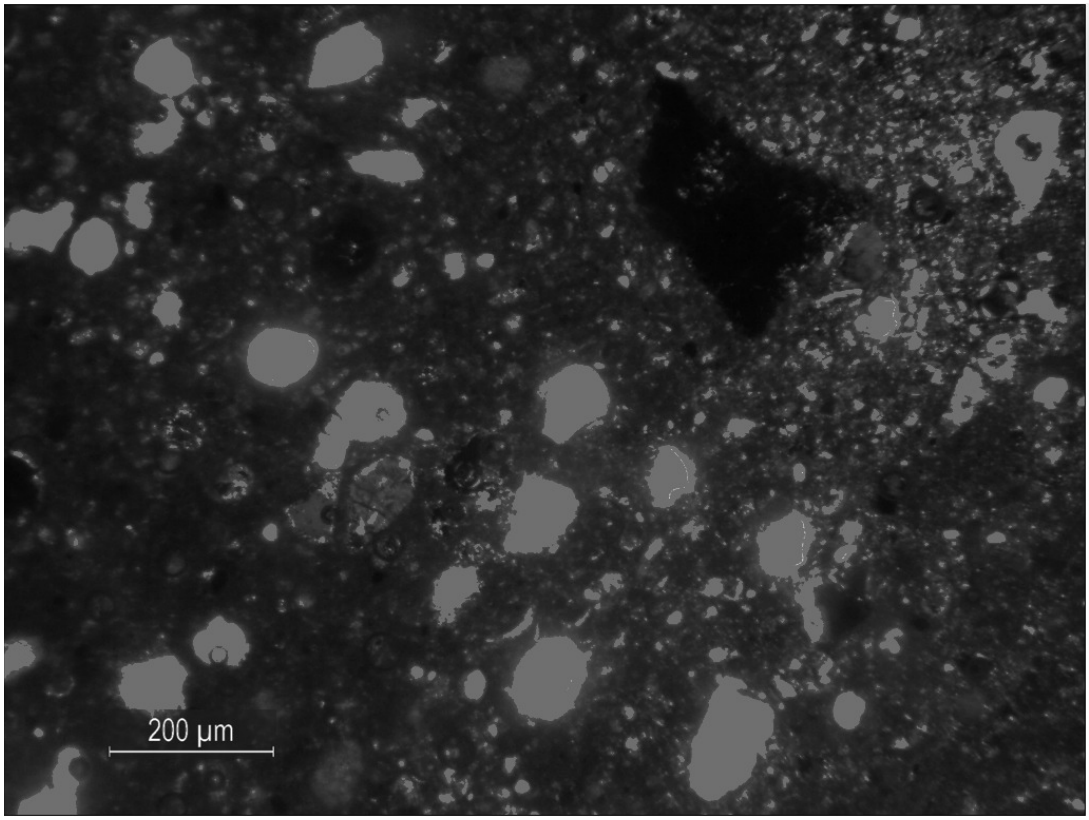
Detailed characterizations of the artefacts were performed using specialized software, in order to develop digital image analysis. ImageJ® - FIJI[41] - was the software selected to perform analysis in this research because it is more powerful and better supported, and works quite well on crystalline mineral analysis. Image analysis has been incorporated into ceramic studies in the last two decades and has proven to be a quick and efficient method. Several authors have highlighted the usefulness of image analysis in archaeometric studies and paste analysis, especially in textural approaches (see, De la Fuente and Vera 2015: 257-265). The estimation of quantitative textural

[41] Public domain developed by Wayne Rasband at the National Institutes of Health.

parameters through digital image analysis can be complementary to traditional petrographic study techniques. Thus, figures such as percentage, area, perimeter, and orientation of the particles generate data that allows comparisons of the total amount of non-plastic inclusions between different samples. These actions also make it possible to quantify the porosity, the percentage of voids and other physical properties in the ceramic body that potentially identify the addition of temper or mixtures of clays to the paste under analysis (Middleton et al.,1985; Orton et al., 1993 ; Polvorinos, 2001; Polvorinos et al., 2001, 2005 ; Reedy, 2008; Velde and Druc, 1999; Whitbread, 1991).

Individual photomicrographs were taken during the petrographic analysis at Durham University, UK, and used for image processing with ImageJ - FIJI. The photomicrographs were taken in plane polarized light and crossed polarized light. Digital image analysis was carried out on all the samples collected for this research and the quantitative values generated were compared between the samples. First photomicrographs were imported into the software and converted to 32-bit grey scale, then through the select tool ‘threshold' the pores and the inclusions were separated from the rest of the ferrite. Under 'set measurements' the area, shape descriptors, area fractions and feret's diameter were selected. Then, under 'analyze particles' a large number of small unidentifiable particles can be analyzed, thus, the size limits were used to filter out these small particles. Following a routine procedure, the software processes the image drawing around each individual grain, and calculates the number of grains and voids and the total area occupied by them (Blanco-González et al., 2014; Polvorinos et al., 2001; Reedy and Kamboj 2003; Reed, 2006).

To get a better idea about the circularity of particles, an outline of the particles was selected to measure how round the particles were and to map out where each particle lay. The software then processes the information and produces a drawing of the particles, also the summary of the particles analyzed. It shows the particle count, the total area of the particles, the average particle size, the average circularity, the average solidity, the average feret diameter (the largest dimension of the particle), the centroid of the particles relative to the image (in X and Y coordinates), the average feet angle, and the minimum feret diameter. The individual results of the analysis were put into Excel to produce comprehensive graphs of the data collected.



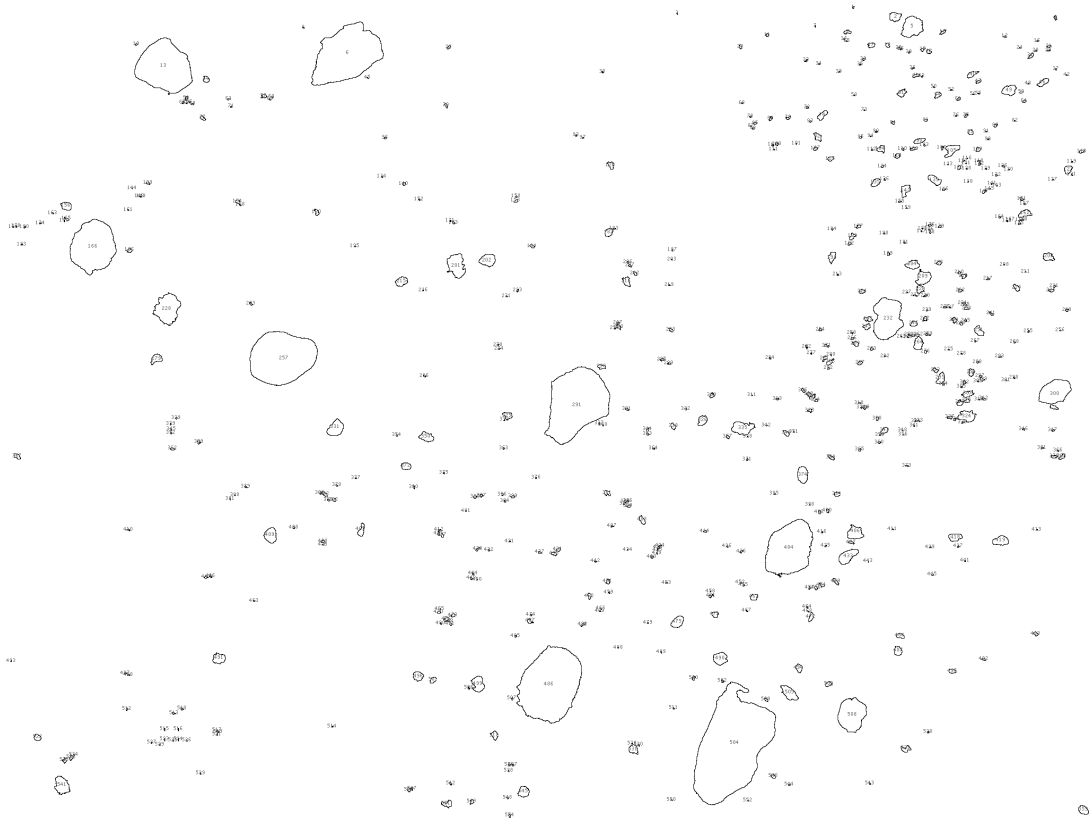
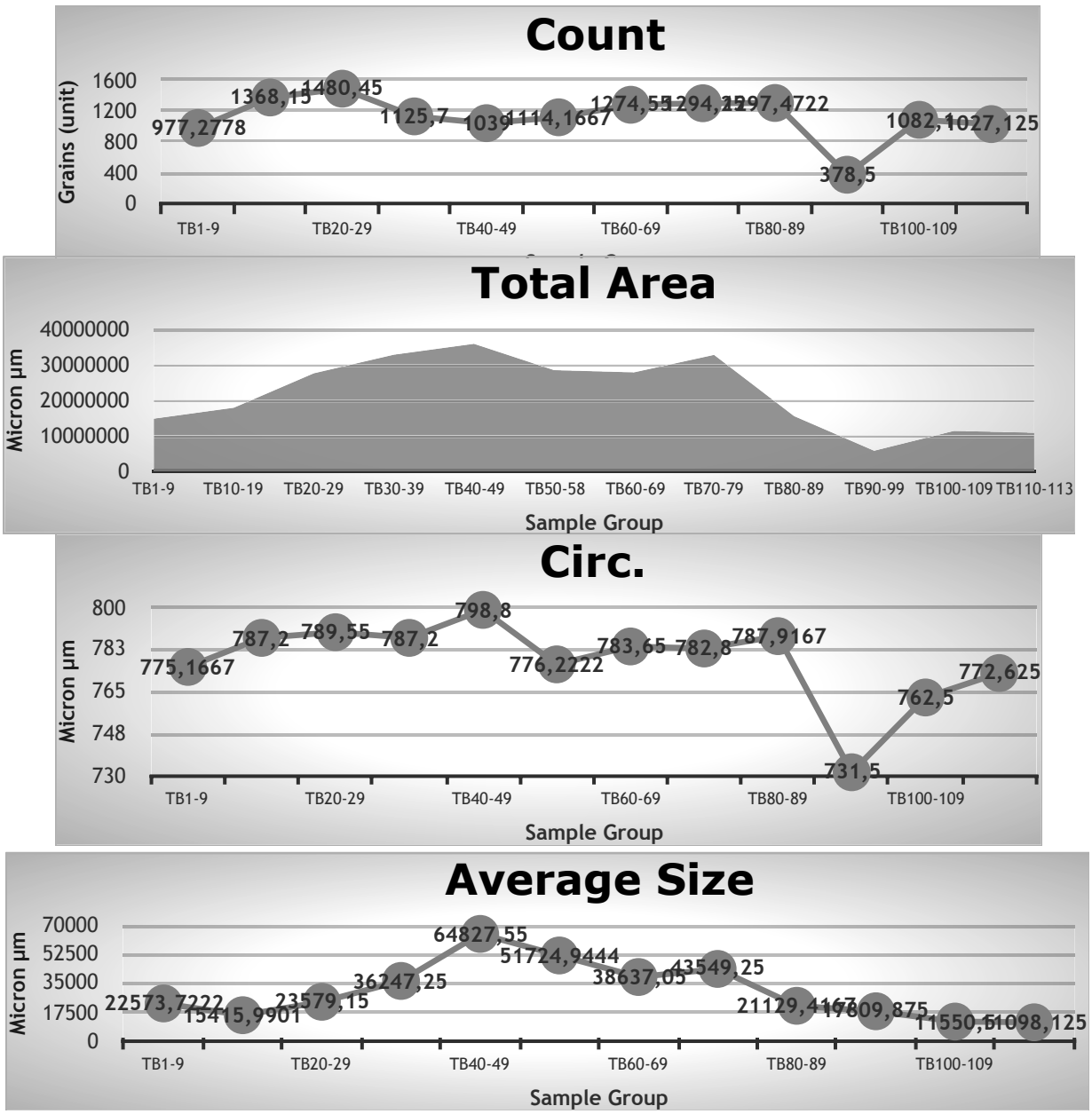


Fig. 24. Image analysis with FIJI - Durham Archaeomaterials Research Centre, Durham University, UK.

The overall opinion of scholars is that digital image analysis, either for ceramics, polished thin sections or petrographic sections, should be a complement to more traditional methods, namely the binocular magnifying glass (De la Fuente and Vera 2015; Livingood and Cordell 2009; Frahm et al 2008; Reedy 2006, 2008; Whitbread 1991). A number of software packages for handling, processing and image analysis are available and have been adapted to the study of material culture (Corel Graphics ®, Adobe Photoshop, Micrograph Publisher®, Image-Pro Plus, Colormod®, Clemex Vision PE®, Matlab, DStretch®, ImageJ®). ImageJ® have processing functions such as contrast manipulation, brightness and intensity, smoothing, taking off noise, thresholding, edge detection and applying different types of filters. The programme can calculate areas and statistics of pixel values , measure distances and angles, create density histograms and profile plot lines. It also supports deployment of multiple images with different types of processing on a single window, so the operator can see the evolution of the original image.

Mappings visuals are obtained with a process called 'thresholding' made on an image B&W 8-bit, 16-bit or 32-bit. The main advantage of the digital analysis of the analysis by binocular microscope is that the information may quickly express visual and numerical levels by mapping the minerals in the images. The other observed advantages are that the user can create their own macros for the analysis, and it optimizes the processing time of the images. Among the main disadvantages observed using ImageJ® is when working with 8-bit images, the B&W quantifies all the particles detected without discriminating between mineral inclusions, rock fragments and cavities. This is a process that must be performed by the user, editing the image based on data previously obtained by binocular microscope and petrography, and carrying out quantification and measurements later. However, the ImageJ® presents an option for the thresholding RGB images, allowing the generation of a macro allocation of coordinates to a specific colour for each mineral inclusion and rock cavities (De la Fuente and Vera 2015: 257-265).

Graphs and tables of Image analyses are presented in the next section and help to define petrographic groups to determine provenance and to demonstrate grain variation. The combination of archeomatric and archaeological data with regard to the case studies generates sufficient data (see Appendix II) to allow for the petrographic study of groups of pottery from the Roman Period and for a comparison with the data collected in order to identify workshops and the provenance of the artefact to help our understanding of its intra-site and contextual relationships.



Sample Group	Count	Total Area	Average Size	Circ.
TB1-9	977	14827702	22574	775
TB10-19	1368	17909901	15416	787
TB20-29	1480	27604935	23579	790
TB30-39	1126	32839672	36247	787
TB40-49	1039	35903538	64828	799
TB50-58	1114	28495752	51725	776
TB60-69	1275	27867972	38637	784
TB70-79	1294	32780815	43549	783
TB80-89	1297	15544788	21129	788
TB90-99	379	5800415	17810	732
TB100-109	1082	11395147	11551	763
TB110-113	1027	10874244	11098	773

Fig. 25. Image analysis for count, total area, circularity and average size of grains on the samples.

7. Archaeological-Archaeometric Evidence

The petrographic data that with similar petrographic components enabled the characterization of provenance groups. Further research using archaeological chemistry publications also helped to define the collection areas for the raw materials (e.g. Goffer 2007; Gribble and Hall 1985; Nesse 2009). Geological maps of Israel were consulted to locate the regions where the mineralogical components and types of clay would be found. In addition, percentages of quartz and bioclastic material were defined in the thin sections under analysis to relate to the possible source locations.

Provenance was thus based on the geological (petrographic) characteristics of the localities and according to soil, clay and mineral maps for each region (Dan et al 1972; Krasheninnikov et al 2005; Hall et al 2005). The use of petrographic comparative published material, such as Goren 2004, Ownby and Bourriau 2009; Ownby and Griffiths 2009, Ownby 2010, Gorzalczany 2006, and Lapp 1997 gave strong support to the suggested identifications of workshops in this research in petrographic terms. Sites located in certain geological areas were suggested as probable sites for the manufacture of the oil lamps sampled. The clay lamps were associated with ritualistic and commercial practices and one must also consider that the production sites reflect the decorative tastes and iconographic sensibilities of their respective regions of manufacture, which were most frequently dominated by particular religion-ethnic groups. The larger sites were most likely the places of manufacture and where the workshops were located as they had the resources and infrastructure, beyond the demands of religion-ethnic and social groups, for massive production of artefacts and their eventual distribution. Although the same production also might have occurred near those sites indicated, as well as in others sites yet to be discovered. Sites close to or with easy transport to a port were also likely producers, or at least centres of distribution of the goods operating nearby.

Recent research on Roman common pottery (cooking, storage, and common wares) used in the Palestine has included two main sites in Galilee as s manufacturing sites during the Roman and early Byzantine periods ca. 50 BCE through ca. 430 CE: Kefar Hanna and Shikhin.

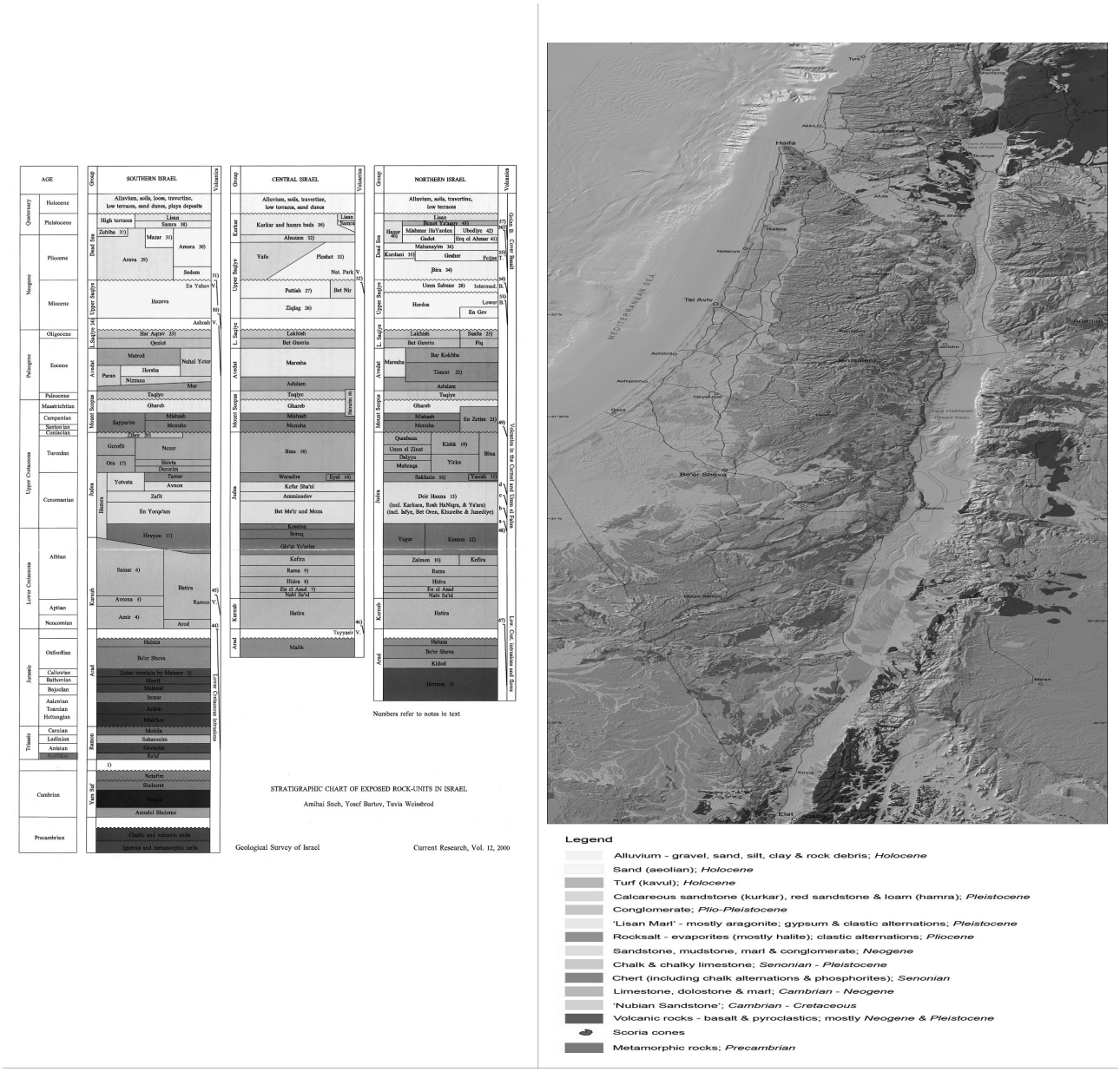


Fig. 26. Stratigraphy and Geological Map of Israel (Sneh et al. 1998).

The 'Galilean pottery' has been was defined through micromorphological soil analysis along with chemical techniques of instrumental neutron activation (NAA), high-precision X-ray fluorescence analysis, and other techniques for fabric characterization, namely xeroradiography and thin-section analysis. The NAA technique used on pottery collected from 19 excavated sites in Galilee and one surveyed in Golan has shown three compositional groups. Thin-section analysis was also carried out and the workshops of the Kefar Hananya Group (with kiln wasters excavated at

the site), the Shikhin Group (also with kiln wasters and source material on site), and the Golan Gruop demonstrated pottery production at these sites. Rabbinical literary sources from Roman Galilee provided important clues for locating the Galilean sites of Kefar Hananya and Shikhin and indicated that both settlements were pottery-making centres during the Roman Period (Adan-Bayewitz and Wieder 1992; Adan-Bayewitz 1993; Adan-Bayewitz, 1999). The so-called Shikhin storage jar apparently was so well known by about the mid-2nd century CE that its volume could be used as standard for purposes of religious law (e.g. Tosefta Terumot 7.14; Talmud Yerushalmi Terumot 45d).

Fig. 27. Upper Galilee (Orlova and Hirsch 2005: 329).

In Kefar Hananya a pottery kiln of late Roman period was found with a stone-paved approach and the remains of an outer structure apparently associated with the pottery workshop; two successive plaster-lined structures that may have served as clay soaking pools; a pottery dump overlying the destroyed kiln, including the estimated equivalent of 9500 to 13000 whole vessels predominantly of two forms (Adan-Bayewitz and Wieder 1992: 193). So far, I have no knowledge about oil lamp production by the main pottery suppliers from Galilee and Golan during the Roman Period. This seems to suggest that the production and trade of clay lamps was the hands of other regions and suppliers.

During Late Roman period the discovery of a ceramic workshop at Elusa in the Negev (Fabian and Goren 2002:145-153) shows us that kilns were active in the (Southern) region for the production of storage vessels. The industrial area of the workshop was built of limestone and chalk foundations and mud brick walls. Three ovens, updraft kilns for smaller vessels, were found on the excavation, as well as ceramic wasters, sherds and other refuse. Late Roman-Byzantine kilns were also found in Ashkelon (Fabian and Goren 2001: 211-220) and a complex workshop next to the theatre of Bet She'an (Bar-Nathan and Atrash 2011).

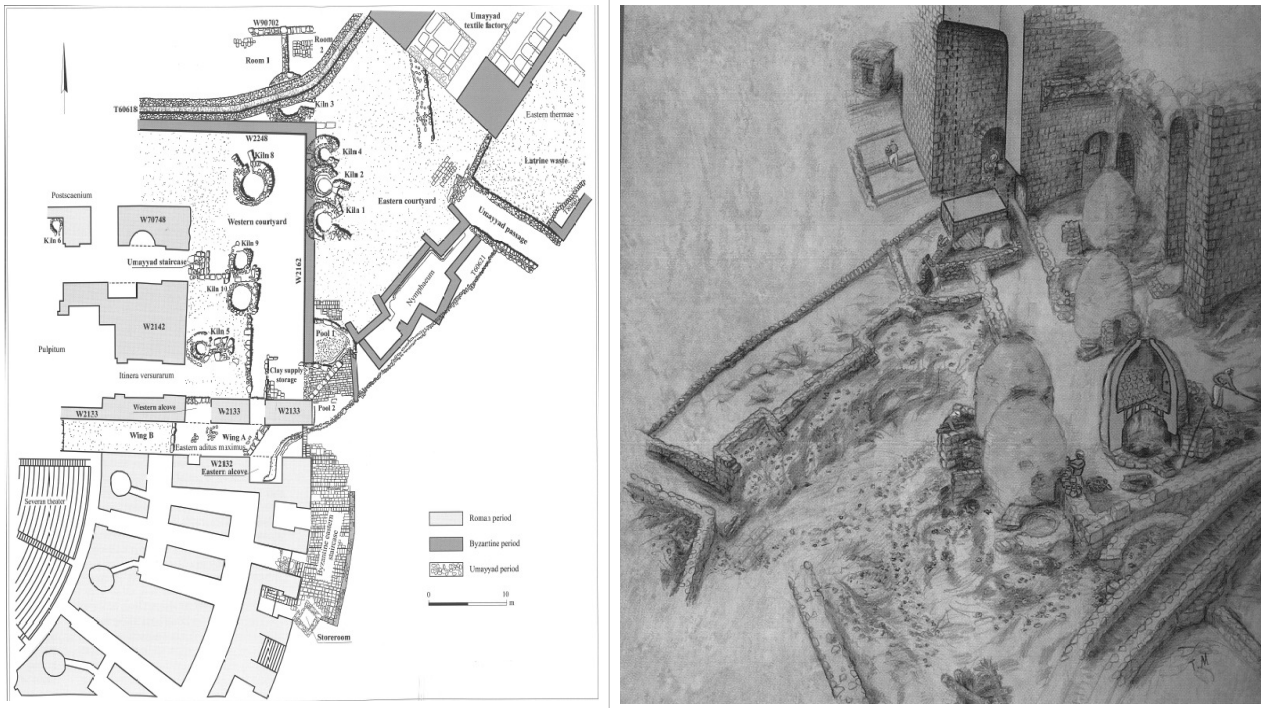


Fig. 28. Workshop in the theater of Beit She'an
(Bar-Nathan and Atrash 2011:20-21, plan.2.1).

According to Wieder and Adan-Bayewitz (2002: 393-415), the preferred raw materials of Roman pottery producers in Roman Galilee would be those that did not need the addition of tempers. Four main soil units were identified from the pottery sample: 1) *Terra-Rosa Soil*, derived from hard limestone or dolomitic limestone in the sub-humid Mediterranean climate of Israel, with a clay fraction free of calcium carbonate; 2) *Brown Rendzina and Pale Rendzina*, derived from soft to moderately hard limestone in a semiarid climate, usually chalk, with various amounts of calcium carbonate in the clay fraction. The amount of calcium carbonate determined the variant colour of the soil (pale brown to brown); 3) *Red-Yellow Rendzina Soils*, derived from moderately hard limestone in a sub-humid Mediterranean climate, with calcium carbonate in the clay fraction; and

4) *Basaltic Brown Mediterranean Soils*, derived from basalt weathering irrespective of the rate of pedogenesis. Apparently if certain raw materials were unsuitable for the potters' purposes, they improved them either by the addition of soil free of carbonates to highly calcareous soil material or by adding calcareous material to soil free of carbonates.

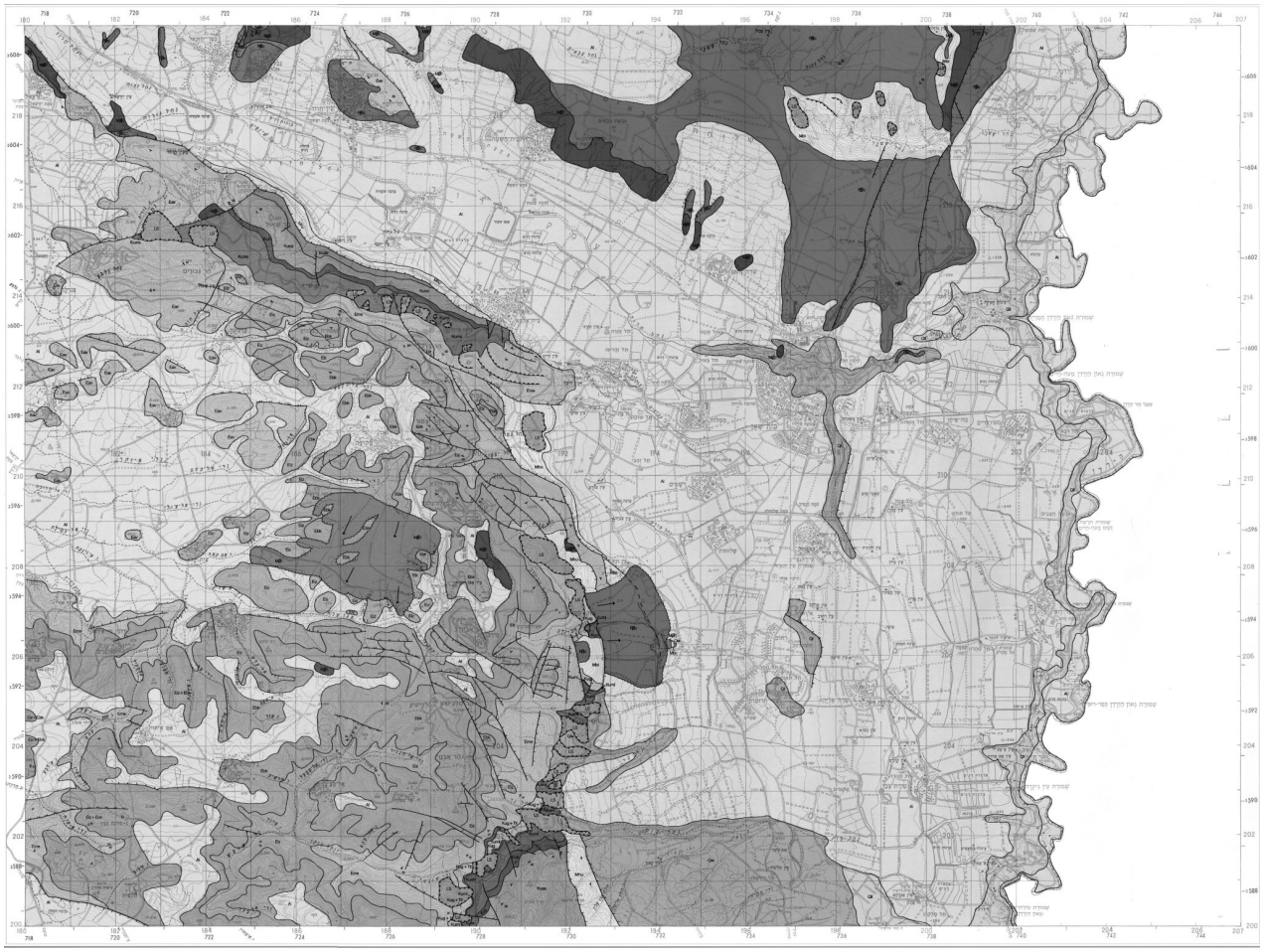


Fig. 29. Geological Map of Beit She'an area.

Terra-Rosa soil, rich in kaolinitic clay, developed in the Hananya Valley zone on Lower Cretaceous parent material that occurs in the Galilee. As far as we know, hard limestone and hard dolomitic limestone do not contain silt-size quartz grains, thus the aeolian dust widely contributed to the microstructures patterns of the soil. The dust in the pedogenesis of this soils unit includes about 10-15% clay minerals. The silt content is about 30% mainly composed of quartz grains. Silt-size quartz grains and very fine sand ranging from 30µm to 100µm appear in these soils (Wider and Adan-Bayewitz 2002: 395).

The petrography description of *Kefar Hananya Group* is dense and red (2.5 YR 4/8), with a ratio of micro morphological components at 60% matrix (clayey material), 35% inclusions (skeleton of mineral grains and rock fragments) and 5% voids (pores). The inclusions consist almost exclusively of silt-size (30-100µm) angular quartz grains. Other components are a few silt-size grains of augite, hornblende and plagioclase. Occasional opaque silt-size grains and a few chert rock fragments also occur. The plasmic fabric can be divided into two parts, the outer zones exhibit a mosepic, misspeak, and skelsepic fabric, and the inner zone an aspic fabric. A few regular voids of about 500µm appear as channels or vughs. Pedological features are iron noodles or concretions that include silt-size skeleton grains. Site sampling was Dabiya, Rama, Kefar Hananya, Horvat Hazon, Gamla, Roman Tower, Ginnosar (boat), Susita-Hipos, Hammath Tiberias, Sepphoris-Diocaesarea, and Beth She'arim.

The micro fabric of all the samples of this group is similar to that of terra rossa soils of the Galilee which are characterized by developed mosaic, mastic and vosepic fabric. They contain many more voids (pores), in the form of vughs, channels, and planar voids (cracks), than are found in the fired pottery made from these soils. Following preparation and firing, the sepic fabric is still preserved in the outer zone, while the inner zone, although remaining optically anisotropic, now shows an aspic fabric. The voids have lost most of their natural distribution, and planar voids no longer occur. The change of plasmic fabric from speak to aspic by preparation and firing apparently indicates a partial destruction of the structure of the clay minerals. The rock fragments and the large amount of silt-size quartz grains within the soil material act as a natural temper (Rice 1987:408), and additional temper was not needed for ceramic manufacture.

Unlike the Kefar Hananya and Golan Groups, temper was added to the soil material in the manufacture of the Shikhin Group. Apart from the calcareous chalky material added to the soil materials, the composition of this group is similar to that of the Grumusol soil types.

The appearance of the foraminifera is one of the important components in the soils and of the pottery made from Brown Rendzinas and Pale Rendzinas. Foraminifera grains are destroyed to a large extent by dissolution and recrystallization processes on the Nari of chalky Eocene-age rocks in Israel, containing about 60% foraminifera biorelicts in the upper part and 30% in the lower part of

the Nari[42]. Brown Rendzina (Haploxerolls) containing about 10–20% calcium carbonate in the clay fraction, characterized by a brown colour (7.5YR), which together with fragments of Nari crust, is eroded and transported downslope, forming parent material for Colluvial-Alluvial soils (Xerofluvents) and Grumusols (Xererts) from where the pottery was made (Wider and Adan-Bayewitz 2002: 399). Colluvial-Alluvial soils (Rendzina-Derived) consist of many silt-size quartz grains, chalk rich fragments and Nari fragments. They contain fewer foraminifera grains than the chalk, and most of the foraminifera occur in the rock fragments, though single foraminifera grains can occur. Large quartz grains occur because of the alluvial influence on the soil material and many voids are present, mainly vughs. On the other hand, Brown Grumusols (also Rendizina-Derived) consist of many silt-size grains, with just some Nari fragments and far fewer chalk fragments, also with many single foraminifera grains and voids as skew planes. Pale Rendzina was composed of few silt-size quartz grains of aeolian origin and many chalk fragments, highly calcareous with interconnecting ughs and root remnants on thin-section.

Red-Yellow Rendzina soils can also appear, and the small calcite crystals give the rendzinic character to the soil material, composed of many microspars and microcalcites. The red and calcareous plasma include a large proportion of microcalcites and microspars, sometimes soil nodules from terra rosa soil material also occur, as temper to improve the properties of the highly calcareous soil material. There are many silt-size and very fine sand-size quartz grains, also soil noodles leached from carbonates displaying birefrigence. Due to the impact of high firing temperatures, some variants of this rendzina soil show a dark grey and loose of microstructure (Dan et al. 1972).

The fourth soil material used to make pottery during the Roman period was the basaltic brown Mediterranean soils, composed of many silt-size quartz grains, with some large olivine, augite and iddingsite grains. Iron-Manganese nodules can occur sometimes. The large contribution of aeolian dust in the soil material can be observed through the presence of quartz grains. Interconnected voids and vughs also occur with craze planes resulting from stress induced by the high specific density of the soil material and swelling and shrinking (Wider and Adan-Bayewitz 2002: 406).

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[42] Outcrops of a calcareous crust, the Nari crust is divided into two parts: the upper Nari, about 70cm thick, with properties similar to those of hard limestone, and the moderately hard lower Nari, about 100 cm thick (Wider and Adan-Bayewitz 2002: 399).

Because carbonate and basalt rocks do not contain silt-size quartz grains, the aeolian dust of desert origin is responsible for large amounts of such grains in the soils development on these rocks (Yaalon and Ganor 1973: 146-155). Thus, there is a relationship between the amount of aeolian dust in the soil material and the characteristics of the pottery. The properties of the soils depend on this silt component, which, in turn, affects pottery production. The quartz-rich material in soils formed on basalt rocks varies from around 35% exclusively of dust origin, and residual material released from the dissolution of the rocks at about 2 %.

At the outset it should be mentioned that classification into groups depends on the characteristics of the parent material from which the soil is derived. Pottery made from soil material developed from the same parent materials might belong to the same fabric group. Deviations from the composition of the original parent material can be recognized, and pottery made from such different materials can be assigned to distinct groups. Eric Lapp (1997) studying forty-three lamp samples belonging to the discus class, bilanceolate, and bow-shaped nozzle classes, from sites located in several geographic areas in Israel and Jordan (Central Coastal Plain, Galilee, the northern Jordan Valley, and Transjordan), defined six distinct petrographic paste groups for pottery making. Chronologically the lamps cover from the 1st to 5th CE (discus - 1st-3rd CE; shaped nozzles - 4th CE; and bilanceolate - late 4th - 5th CE).

The predominant sedimentary geological profile of the region is composed of quartz (angular and poorly sorted) sand, calcite (rhombic crystals of calcite or dolomite), limestone, hematite and microfossils. Although high firing temperatures for lamp making could be responsible for the decomposed skeletal remains, the disarticulated foraminifera could also be the result of ground foraminiferous rich limestone added to the lamp paste by the lampmaker or by a highly agitated depositional environment. However, no major diagnostic traces of tempers such as basalt rock fragments were observed in the lamp fabrics studied by Lapp's study. Based on the sedimentary nature of the mineralogy and presence of calcareous microfossils, the petrology indicates that the lamps were manufactured with calcareous clays (Lapp 1997:145-146). Large amounts of silt-size quartz grains, naturally occurring in the clay, resulted from the dissolution of hard limestone or dolomitic limestone mixed with aeolian dust material originating in the Sinai and Sahara deserts (Adan-Bayewitz and Wieder 1992: 146-155).

The six of Lapp's (1997: 148-152) petrography groups are described above: 1) Petrographic Paste 1, high percentage of poorly preserved and mottled bioplastic inclusions; Petrographic Paste

2, very high percentage of well-preserved foraminifera, ostracod valves, and shell fragments; Petrographic Paste 3, high percentage of limestone inclusions; Petrographic Paste 4, high concentration of quartz sand exhibiting high sphericity; Petrographic Paste 5, comparatively low percentage of nonelastic inclusions; Petrographic Paste 6, high concentration of hematite inclusions.

In Petrographic Paste 1, the inclusions are poorly sorted with a high percentage of sub-rounded quartz sand exhibiting low sphericity, dark green material that could be vegetal matter, and a vitrified appearance to the paste (range of 700 oC). The vitrified appearance of the paste (high temperature of firing) might have been due to motting bioplastic inclusions, such as globigerinids, shell fragments, and disarticulated ostracod valves, comprising in this group. Lapp identified 12 lamps with this fabric at sites such as (7) Sepphoris, (1) Pella, (1) Meiron, (1) Horat Hazon, (2) Ashkelon.

Lapp sampled forty-three lamps: twenty Roman discus lamps (Palestinian round) with decorated disc; eight Beit Nattif with bow-shaped nozzle; and fifteen bilanceolate (forma de pêra). A total of ten sites were sampled: Ashkelon and Caesarea Maritime (coastal plan); Horbat Hazon, Meiron, and Sepphoris (Galilee), Scythopolis (northern Jordan Valley); Avila, Gadara, Gerasa and Pella (Transjordan). Additional bowl fragments from the hippodrome workshop at Gerasa were analyzed for comparison (thus, a total of 47 samples).

The twenty Roman discus lamps came from eight sites: Abila (1); Ashkelon (3), Caesarea Maritima (1), Horvat Hazon (1), Meiron (1), Pella (2), Scythopolis (3), Sepphoris (8).

The Petrographic Paste 2 is composed of a very low percentage or absence of quartz inclusions, with very high consternation of well-preserved microfossils (planktonic foraminifera, highly disarticulated ostracod valves, mollusk shell fragments, and coral fragments). A low firing temperature (approximately 400 oC) could explain the good state of preservation of the microfossils allowing for the observation of the internal structure of the globigerina which are comprised of bulbous chambers replaced by secondary patty calcite. Quartz sub angular to sub-rounded (low sphericity) and very fine quartz sand, rhombic crystals of calcite or dolomite, and opaque matter are also included in this fabric. The rich foraminifera significantly indicates that the source or sources were marly clay, and this bioplastic material exhibits a very low degree of merging and the boundaries are well-defined. Lapp identified 22 lamps that fall into this fabric group (with subdivisions, see Lapp 1997:148-150), from sites such as Gadara (8), from Pella, (5), from Sepphoris (4), from Scythopolis (3), Abila (1), Ashkelon (1).

Two discus oil class lamps sampled from Scythopolis with different typological forms, and a bow-shaped nozzle, sampled from Gadara, share the same petrographic characteristics and belong to the same paste group. This suggests that the same raw clay source had been exploited for their manufacture. They are included in the Petrographic Paste 3 group, which contains very fine to medium well-sorted quartz sand, a high percentage of well-rounded limestone fragments, with a high degree of merging, while the quartz exhibits low merging. Microfossil are poorly preserved with their primary internal structures lost.

The Petrographic Paste 4 group have as their chief diagnostic characteristic inclusions of quartz sand with a high degree of sphericity and grains which are very fine to fine in size. The very well-sorted and concentrated nature of the well-rounded quartz indicate a location in the Nubian sandstone geologic formation, derived from Nubian sandstone clays from the vicinity of Gerasa. The Petrographic Paste 5 group has a very fine micritic fabric, with very fine to fine quartz sand inclusions, well sorted and angular. Also, like petrographic paste 4, this incluse lamps with bow-shaped nozzles and a fabric with a low percentage of microfossils (planktonic foraminifera species include globeriginids and disarticulated ostracods). Only two samples from Sepphoris fall into this group in Lapp's study.

The last is the Petrographic Paste 6 group with a red fabric, characterized by a high percentage of quartz sand inclusions with poor sorting and a low percentage of microfossils. The paste group has a high concentration of hematite, which in turn is the component that gives the colour of the lamp paste. Only one lamp from Abila falls into this category (Lapp 1997: 148-152).

The Petrographic thin-section analysis, therefore, has revealed that foraminiferous-rich marls were used for the manufacture of lamps, especially the bilanceolate class. The pastes recovered from five geographically diverse sites belong to the same textural Group 2 and have (by DCP spectrometry analysis) the same chemical fingerprint. This means that a single clay source was exploited for their manufacture (Lapp 1997:177). Foraminiferous marls occur in central and northern Israel, although the distribution of this lamp class is confined to sites located in the Galilee, the northern Jordan Valley, and northern Transjordan. According to Lapp, Scythopolis and Pella could be the epicenter for the production of this lamp class.

Of more than 1030 lamps storaged in the Israel Antiquity Authority, 89 samples from 19 sites were sampled in Israel. A total of 114 lamps were sampled with the inclusion of Dibij Faraj (Syria) and Carthage (North Africa). Thin sections from several Levantine sites were examined to

establish rough percentages of quartz and bioclastic material to characterize these samples and their respectively localities. A direct comparison between samples and thin-sections from the collection in the Laboratory for Comparative Microarchaeology of the Institute of Archaeology, Tel Aviv University, was carried out. This assisted in determining the differences in the mineralogical compositions of the sands and in assigning provenances to the pottery with a coastal sand temper. The lithology of the thin-sections was compared to the geological maps (Sneh, Bartov and Rosensaft 1998; Dubertret 1945, 1949).

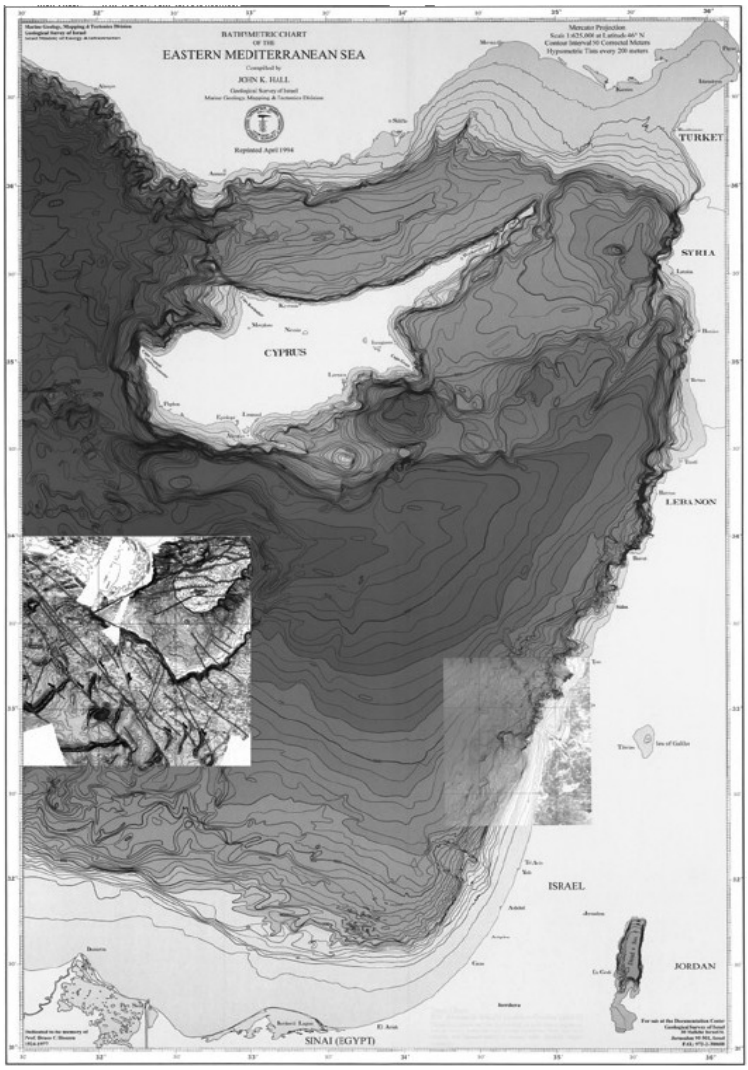

Fig. 30. Levant Basin highlighting the area where change occurs in quartz percentages and bioclasts.

The petrographic study by Cohen-Weinberger and Goren (2004) identified eleven petrographic groups ranging from the southern coast of Syria to the southern coast of Israel. The study by Ownby and Bourriau (2009: 5-7) identified four petrographic groups that cover Lebanon/

Akkar Plain, the coastal area within Sidon and Tripoli, and from Sidon and Akko, also northern Israel along the Carmel Coast. The majority of samples in this research were found throughout Israel and are alighed to these petrographic groups.

Lebanon lies at the eastern end of the Mediterranean sea north of Israel and west of Syria. The geographical features of Lebanon are represented by four distinct areas: the coastal plain to the west, the western cordillera (mountains of Lebanon), the fertile central valley (Bekaa/ Biqãc), and the eastern cordillera (mountains of the Anti-Lebanon).

The Lebanon/Akkar Plain group, predominantly composed of Neogene marl clay, is located in the inland northern Lebanon/Akkar Plain and has dominant inclusions of chalk, micritic and sparry limestone, chert, chalcedony, geode quartz, opaques, and alkali olivine basalt. There is a lack of coastal sediments and a prevalence of limestone, typically rounded to sub-rounded in shape. Quartz exhibit subangular to sub-rounded shapes; chert, chalcedony and geode quartz are typically angular and infrequent. These components are all to be found in the deposits of Santonian-Campanian or Eocene (chert), also Cenomanian-Turonina (geode quartz) age (Beydoun 1977; Ownby and Bourriau 2009: 5). Iddingsite and minerals deriving from the basalts (plagiocalse and pyroxenes) can be found in the matrix. Basalt inclusions and their degree of weathering indicate that they are derived from Lower Cretaceous deposits.

The coastal area of Lebanon is covered by two main petrographic groups, one from Tripoli to Sidon, and from Sidon to Akko. The Tripoli/Sidon group is a petrographically and chemically homogenous group with chert, chalcedony, geode quartz, chalk, micritic and sparry limestone, mica (biotite and/or muscovite), opaques, and very little quartz. The iron-rich rendzina, often utilized for pottery in the Levant, can develop from chalk exposures found within the Eocene deposits that also contain chert. This soil develops on the limestone outcrops throughout the Levant due to the Mediterranean climate, and the sedimentary inclusions once again relate to the Santonian-Campanian or Eocene, and Cenomanian-Turonian deposits in the Lebanese mountains and their deposits on the coast.

The coastal area between Sidon and Akko is a heterogeneous group, with similar materials, namely rendzina clay and bioplastic coastal sand. They differ in the quantities of these components from the other Lebanon coastal area. Inclusions consist of various amounts of beach sand (bioclastic coastal sand) dominated by the bioclasts, which can include fossils of coralline algae, particularly the *Amphiroa genus*. In this research this identification served as a fossil guide for identifying the

sediments used to make the oil lamps sampled on Israeli sites. Quarternary beach deposits of the Pleistocene and younger age usually contain remains of this type of clast (Sivan 1996).

The Sidon/Akko Group contains seventy-three samples in this research. These lamps were made from materials characterized by rendzina, foraminiferous marls clay, and sedimentary inclusions that point out that the area of production was near limestone outcrops. The raw material of this group is the result of erosion and attrition of Senonian and Eocene chalk rocks and marly chalk in Mediterranean climate areas, averaging a pluvial precipitation of 500-700 mm a year. The matrix is carbonatic, light yellowish, heavy in PPL and orange-tan in the middle, light brown on edges, in XPL. There are angular opaque minerals of fine fraction (2% - sizing up to 100µm), sub-rounded at the coarser grain sizes and quartz silt (1%) with a little plagioclase. Dense carbonate crystals occur (15% sizing 10µm - occasionally 20µm or 30µm); the inclusions exhibit coastal bioclasts (beach sand) and limestone, some silt and quartz. Rounded fragments of fossiliferous coastal limestone (Beach rock), separate fossils (<650µm) are frequent to dominant. Calcareous corallinean algae *Amphiroa genus* fossils, with some mollusc shell fragments are present and replacement chert (smoky to brown-stained, up to 1.3mm) There is frequent local intergrowth of chalcedony. Thus, the assembly comprises bioclast inclusions, limestone, flint, chalcedony, quartz, feldspar, iron oxide, opaque minerals, clay pellets, epidote, pyroxene, and in some cases coil. This petrographic group can also contain in its composition amphibole, olivine and tourmaline.

Due to the decomposed bioclasts and lack of limestone the firing temperature for these lamps is estimated at between. The selection of the components of limestone with varied grain sizes (0.06 mm to 1 mm) was not refined; instead clays with natural limestone were used. The chert, chalcedony, and the geode quartz are also present naturally. It is possible that clays may have been brought to the coast; where as a secondary deposit, acquired the inclusions indicative of the coastal plain. This would explain the rounded shape of the sedimentary inclusions and the variability in the amount of bioclasts. However, some samples seem to have a small amount of coastal sand. In general, there is great variety in these samples, probably due to a lack of processing and selection of particular materials for collection. In one case, the sample did not contain inclusions.

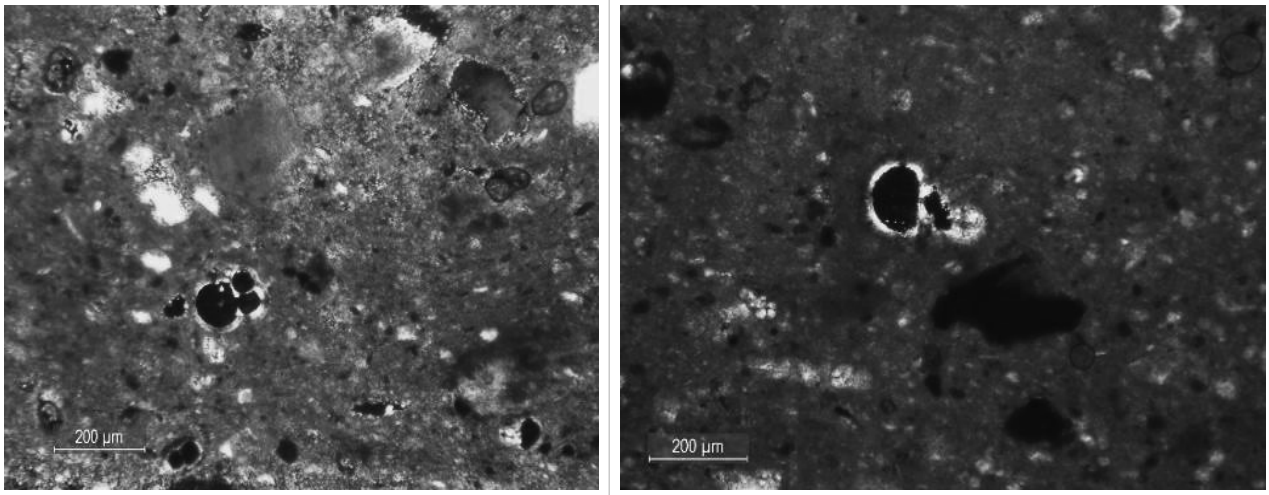

Fig. 31. Group Sidon-Akko, Lebanon Coast, 10x mag.

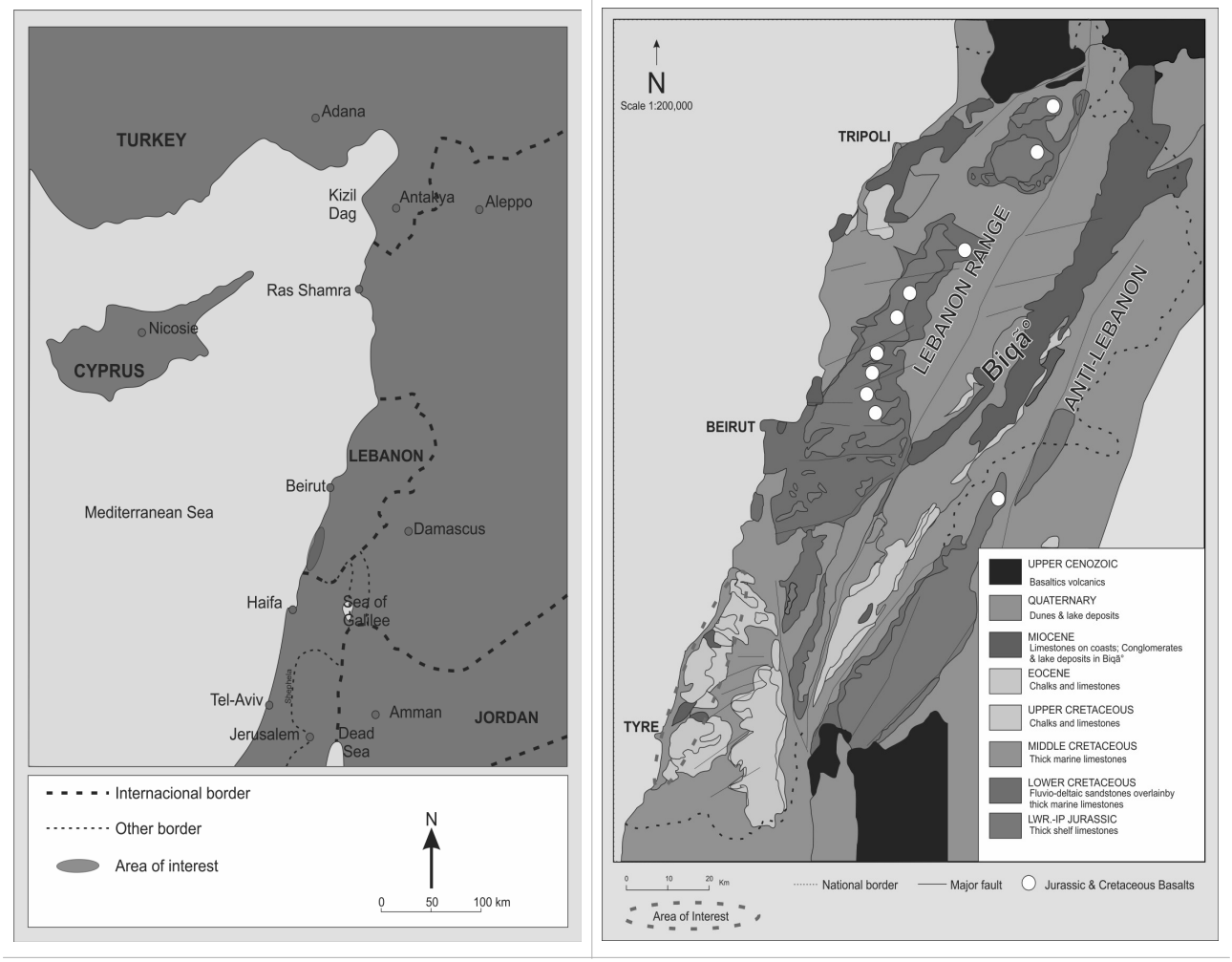

Fig. 32. Localization of Group Sidon-Akko e Geological Map of Lebanon.

Therefore, other components within the inclusion assemblage may further limit the possibilities. The coastal sediments dominated by calcareous bioclastic deposits are a clear attribute of the northern Levantine coast, more precisely chert is connected with either Senonian or Eocene exposures. The Levantine lithostraigraphy northward is composed of thick Senonian deposits of the Mishash formation of Israel and the equivalent Amman formation of Jordan and the greater majority of cherts can be linked directly with Eocene exposures. Such exposures are found predominantly between Tyre and Sidon, and north of Tripoli (cf. Goren 2004:110; Ownby 2010: 135-137 and 219). The quartz, chalcedony, and chert are subangular in shape, while the softer limestone inclusions are sub-rounded. The lack of quartz in the beach sand and the sedimentary inclusions indicate these samples were produced along the Sidon/Akko Lebanese coast. Beach sand in this area has little quartz and prevalent bioclasts. The sedimentary outcrops are found very close to the coast in several areas increasing the likelihood of finding coastal sands with chert and chalk inclusions. Most of the samples were probably manufactured in this coastal area, however some may have been produced near Beirut or Tripoli where small amounts of coastal sand can also appear.

The movement of nearby rivers that empty into the Mediterranean are composed mostly of bioplastic material and minerals formed by Quaternary beach sand on the Lebanese coastal side. Currents along the coast might be responsible for the beach sand grains and a variable amount of quartz in the deposit. The dominant geology of the coastal Lebanese mountain is sedimentary outcrops of limestone, chalk, chert and chalcedony.

The study by Ownby and Griffiths (2009: 56-67) examined mineralogical components and clay types found in modern beach sand from Lebanon. The examination of the composition of the beach sand is reflected in the inclusions found within clay-base ceramics made near the coast. The suggestion is that the variations that occur in the composition of modern beach sand along the coastline of Lebanon might be useful for identifying the region of manufacture for ancient ceramics made near the coast (Ownby and Griffiths 2009: 57).

The petrographic analysis of modern beach sand from Sidon shows that from north of Sidon there is little difference within 1km, but highly variability within 10km. The north Sidon sand beach has a proportion of bioclasts to quartz grains at roughly 60% and 30% respectively, with bioclasts ranging in size from very fine to coarse, typically angular to rounded. The quartz is angular to sub-rounded, and the grain sizes very fine to medium in size. Noticeable is the scarcity of the *Amphiroa genus* and Chert (1%), while there was a slight increase in the amount of iron oxides and green

glauconite inclusions (8%), and fragments of manganese-rich inclusions and angular pieces of spinel among the opaques. The sand beach 1km north is identical almost to Sidon's beach sand.

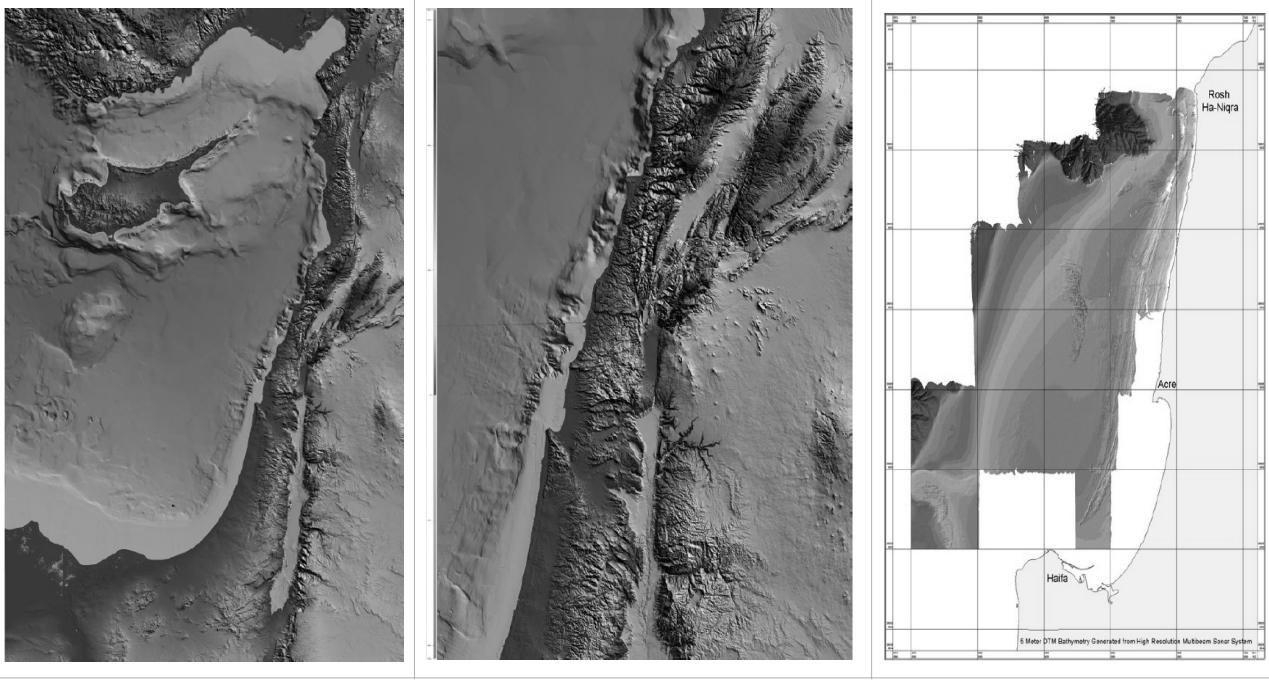

Fig. 33. Geological area of Lebanon (Hall et al. 2005:162-176).

On the other hand, at the modern beach at Tell el-Burak, 9 km south of Sidon, the increase of bioclasts (90%) and the reduction in the amount of quartz (5%) makes the sand quite different. Angular, medium sized chert fragments were also present (5%). The sand is characterised by many nummulite fragments, the calcareous skeleton of a protozoa species, so according to geology features there is nummilitic limestone in this area. The Wadi el-Akbiye probably formed beach sand with numerous nummulite pieces, and fragments of the limestone were carried into the Mediterranean sea in that region. No heavy minerals or iron oxide and opaque inclusions can be noted within the sand, and the bioclasts are sub-rounded to rounded, exhibit very fine to very coarse sizes, with sub angular to sub-rounded quartz grains in fine to medium sizes. The difference within a 10 km range of the sand, therefore, can vary significantly with special attention to the presence of a number of *Amphiroa algae*.

Fig. 34. Chalk Cliffs, Rosh Ha-Niqra on Israel's border with Lebanon.

(Orlova and Hirsch 2005:330)

Fig. 35. Left northern Israel and to the right of the chalk cliffs of Rosh Ha-Niqra.

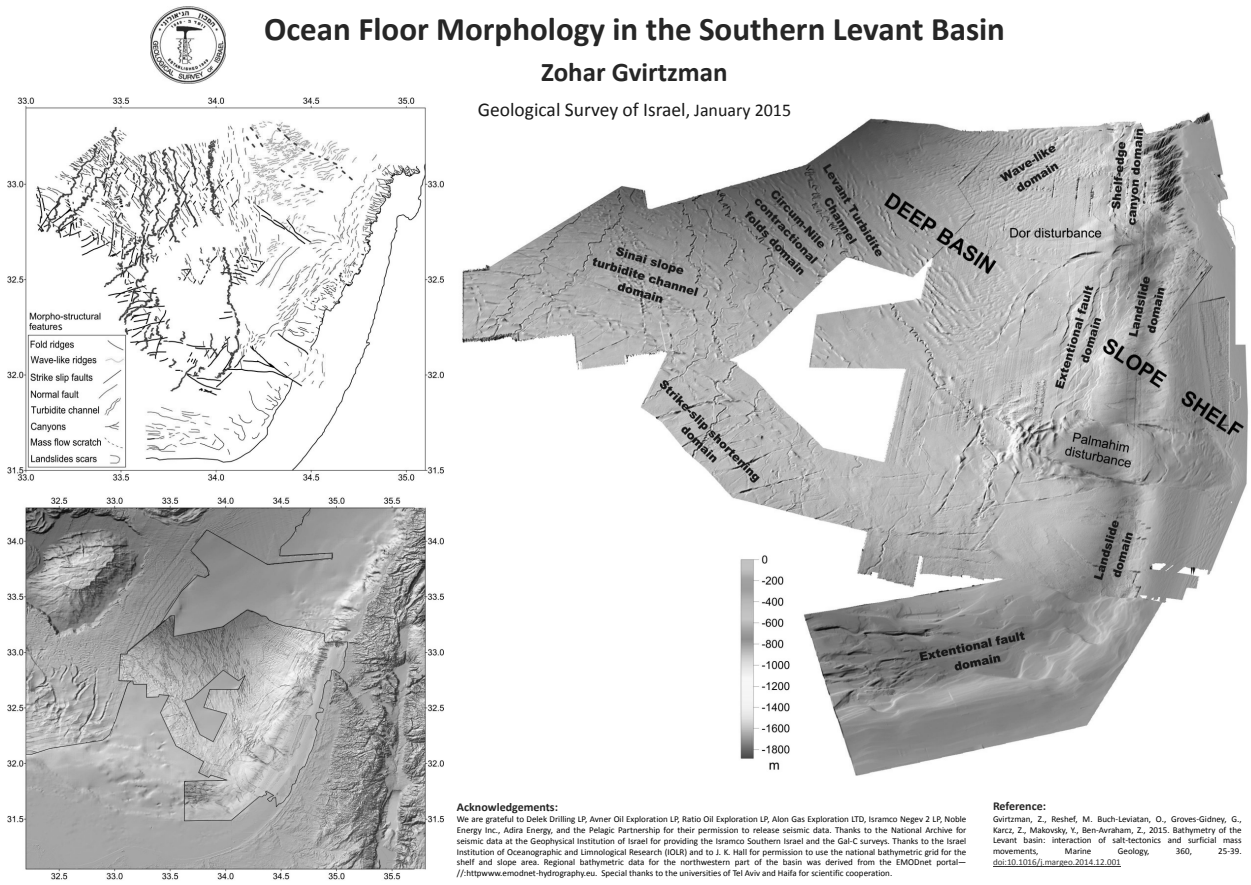

Fig. 36. Morphology of coastal sediments of the South Levant.

The material from the geological composition of the hinterland and the Lebanese coast beach sand is predominantly composed of the calcitic remains of marine species (biolcastas) and quartz grains derived from rivers that drain into the sea. Additional minerals and rich fragments may be derived from geological deposits through which the rivers pass. The size and shape of the grains would be based on where the beach sand was deposited and its history through there. Marine currents moving along the shore may also contribute with components from other regions. In short, this beach sand carries a signature from the geological deposits along the river beds inland of the beach.

The last, and fourth, group is Northern Israel along the Carmel Coast. The coastal plain of Israel (Hebrew: מישור החוף, Mishor Hahof) is a narrow coastal plain along the Mediterranean Sea. The plain extends for 187 kilometers (116 miles) from north to south and is divided into the areas: the Plain of Zebulun (north of Haifa), Hof HaCarmel (Haifa Mount Carmel), the plain of Sharon (Mount Carmel to Tel Aviv), and the Plain of Judea (from Tel Aviv to Zikim). The samples

produced in this area of Israel are typically made entirely of Hamra soil (Cohen-Weinberger and Goren, 2004: 77). Very few Roman oil lamps were sampled (just one cat. TB14, see Appendix III) and were produced from a foraminiferous clay probably derived from the weathering of a limestone rich in foraminifera from the Carmel Coast. The sample from this group differ in the amount of components, much less homogeneous, such as coastal quartz sand, limestone inclusions and small amounts of rock fragments. The group is characterized by a smaller percentage of basalt fragments, and sometimes a matrix derived from highly silty red soil (the Hamra). This composition suggests that with the proportions of sand quartz in this group, it likely reached Northern Israel along the Carmel Coast (Akko).

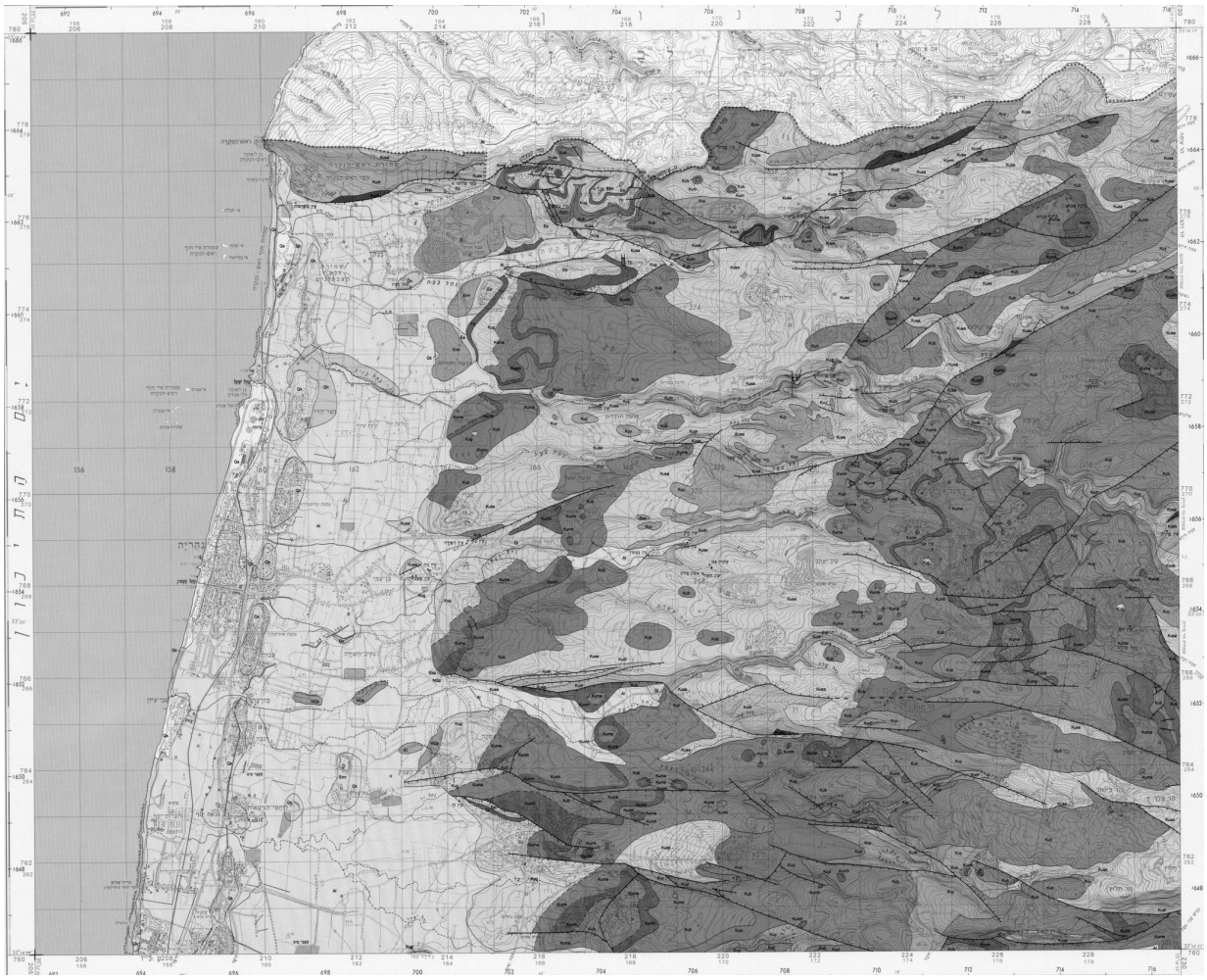

Fig.37. Geologic Sediments of Nahariya border area with Lebanon (Sneh et al. 1998).

These samples were produced from a soil with a rendzina brown colour, but may also have *Terra Rosa* soils as a compositional element (Wieder and Adan-Bayewitz 2002: 395-406). The dominant inclusions are quartz and bioclasts, including some species of algae Amphiroa clast. Less

common polycrystalline grain quartz, feldspars, plagioclase and K-feldspar, limestone, iron oxide, opaque minerals, clay pellets, chert, epidote, serpentine and pyroxene may also occur in the samples of this group. The inclusions comprise 10% of the matrix, being approximately equal parts of quartz grains/ feldspar and bioclasts. The typical range of size is very fine to medium, though occasionally large fragments may occur. Grains of quartz and feldspar are common and sub-angular to rounded in shape, and very fine to medium in size. The calcareous inclusions are very fine to very coarse in size, sparsely present, and rounded in shape. The fragments of chert are sub-round and rarely present in the matrix (fine to medium in size). The samples are brown to reddish-brown under Polarized light plane (PPL) and dark reddish brow to dark brown in cross-polarized light (XPL), and slightly optically active.

Therefore, Amphiroa alga classes are rarely present with the amounts of feldspars, opaques, chalk, and micritic and sparry limestone. The quartz component, which originates from the Nile River, deposited along the Israeli coast due to the Mediterranean currents, decreased, while there is an increase in the bioclasts from Northern Israel to Sidon. These samples were probably produced here as the lack of *Amphrioa* and increase in quartz is characteristic of Northern Israel along the Carmel Coast (Rohrlich and Goldsmith, 1984).

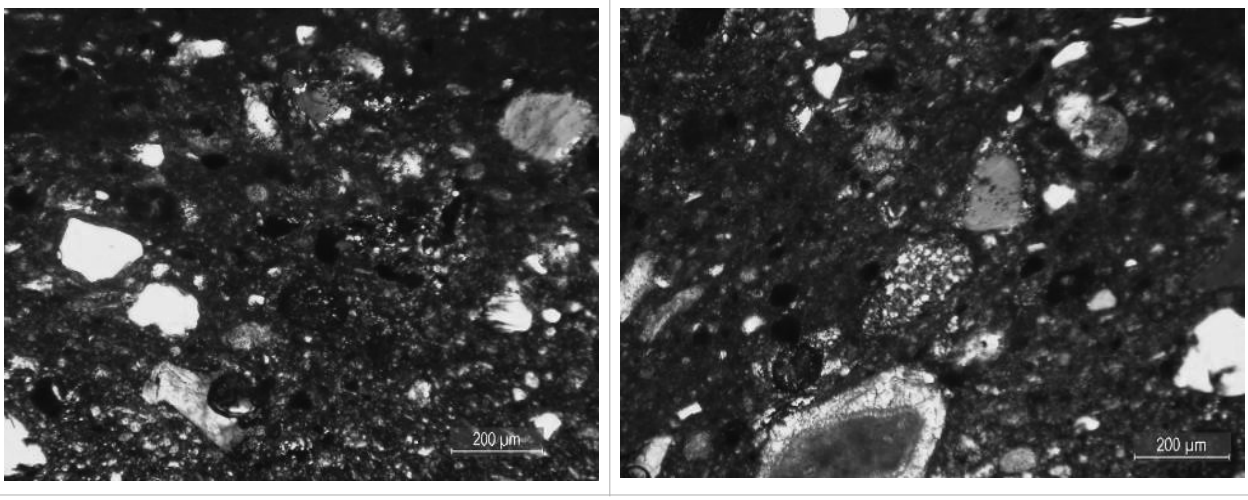

Fig.38. Group North Israel and Carmel, 10x mag.

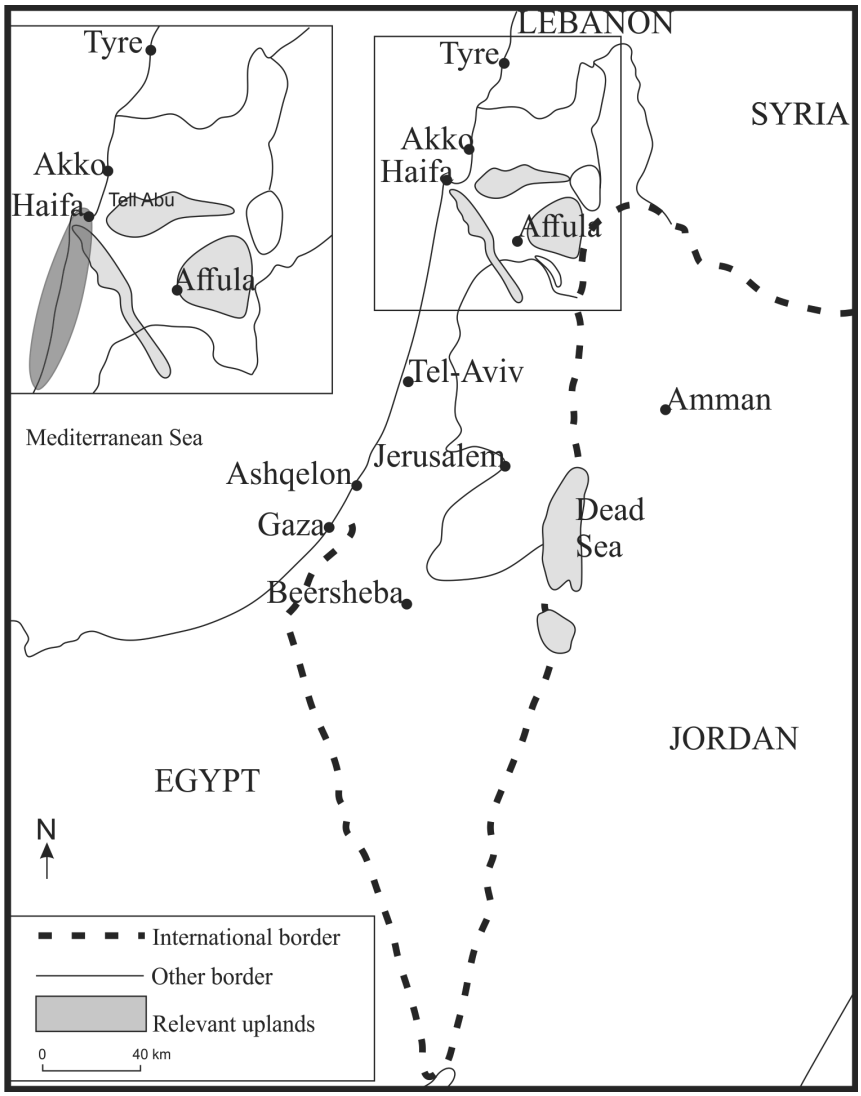

Fig.39. Group North cost of de Israel (Sneh et al. 1998).

CASE STUDY 1: Palestine

8. The cultural significance of Discus Lamps: Lamps and Archaeological evidence for Religion in Roman Palestine of second and third centuries CE

"O espírito do homem é a lâmpada de YHVH, a inteligência e o discernimento humano revelam tudo o que se passa no corpo". (Míshlê Shelomoh 20:27)[43]

Roman Palestine was too complex for a modest research of this sort and it is not therefore possible within this thesis to provide a comprehensive overview of the region. Instead, I will address key issues relevant to the Roman occupation in Palestine. Despite Roman administrative divisions, the region continued to be a geo-historical unit. After the Hasmonean kingdom, Rome (63 BCE) controlled this area for about 350 years, with periodic interruptions. The region became *Provincia Judaea* in the year 6 CE, but after the Bar-Kochba revolt, in 135 CE, the province was named *Palaestine* or *Syria-Palaestine* (135-390 CE). Although the boundaries of the province took on a final form only at the end of the first century CE. Then in the fourth century the province was divided again into *Palaestina Prima* and *Palaestina Secunda*.

The region had military and strategic importance, being between Syria and Egypt, which were Rome's breadbaskets (Millar 1993). When Syria was conquered by Rome after the defeat of Tigranes II of Armenia in the Third Mithridatic War (75-65 BCE.), the decline of the Seleucid monarchy paved the way for the military dispute of the region between Armenia, the Parthians and the Romans. With the Roman victory, Pompey soon realized he could not install a complete and efficient administration in the newly annexed territory. As had happened in the creation of the province of Bithynia (Turkey), Syria was troubled with problems of governance and had to be sub-administered. Rome realized that it could not increase its representatives in the region, and that it had to depend instead on local communities, particularly upon the Greek city-states, to maintain its hold on the territory. Many of the practices adopted in Palestine and Syria could not be easily changed and/or abandoned in the short term. Thus, the dynasties, city-states, emirates and people in the region were used to establishing control, allowing some administrative and religious autonomy.

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[43] נֵר יְהוָה נִשְׁמַת אָדָם חֹפֵשׂ כָּל-חַדְרֵי בָטֶן
Ner YHVH Nishëmat Ådam Chofes Kal Chadërey Vaten:

In short, the same problem of local autonomy was equally the solution for the administration, maintenance and control of this broad territorial area (Sarte 2005).

During the Roman Civil War, Julius Caesar was the one who personally reinforced Roman authority in the region when he crossed Syria to fight in Anatolia against Farnaces II, son of Mithridates VI of Pontus, who challenged control of Rome in the region. The arrival of Caesar in Antioch (in 47 CE) was preceded by a friendly letter announcing the 'liberation of the city', ushering in an era of 'caesarean freedom'. Three legions of the Roman army were in charge of defending the border with the Parthian Empire and maintaining the internal cohesion of the recently created Province created. Consequently, among the new buildings constructed in Antioch to mark the arrival of Caesar to the capital of the new province, a basilica was dedicated to him with his statue and Roman Tyche, goddess of fortune. The foundations of the Roman imperial cult were first launched in the Middle East through the Caesareum of Antioch.

Therefore, Caesar and Rome occupied the place previously reserved for Hellenistic rulers during the Seleucid monarchy. However, the geographic fragmentation and provincial politics, allied by the difficulty of mobility due to the steep topography of the region, and the indigenous traditions of various local groups, aggravated the administrative problems for Rome. Initially governed by politically subordinate monarchs (mostly by the Comagena, the Hasmoneans, and the Nabataeans kingdoms), Syria Province (επαρχία - 64-135 CE), with regard to the southern part, was managed through *praefectus* appointed by the Emperor (also directly linked to the Syria administration) to resolve the problems of governance on the region.

The division performed by Septimius Severus in 194 CE, began a new process with further consequences, such as Syria Palestine became subordinate to the Diocese of the East in 293 CE and following the tutelage of the Eastern Praetorian, the *Praefectura Praetorio Orientis* from 337 until the seventh century CE. During the Roman occupation in Palestine, hundreds of temples and shrines were built in a period extending from the first century BCE to the late third and early fourth centuries CE. Also, the increased urbanization of Palestine was a solid demonstration of fidelity and loyalty to Rome, both during the period when Herod was in charge of the Kingdom of Judea, as well as later with the formation of the Province of Judaea and Palestine and its new sub-divisions.

Jews initially received privileges from Julius Caesar (and Octavian) due the support of Anipater, the father of Herod the Great, and there was a Jewish contingent in the battle for power and control in Egypt (Jos. Ant. XIV. 127–136). Following the conquest of Judaea by Pompey in 63

BCE, Gabinius divided the predominantly Jewish area into five districts, designating Sepphoris as the district capital of the Galilee (ca. 57-55 BCE). Despite the images of victory from both the Flavians and Hadrian, which were used to bolster their power and prestige over the Jews in the first and second Jewish revolt (66–73 and 132–135 CE), Palestine was generally off the world stage as simply one more territory controlled by the Romans or those affiliated with them.

The end of the Antonines rule with the death of Commodus (192 CE) marked also the beginning of civil war between Septimius Severus, the African-born general, and his opponent in Syria, the legate Pescennius Niger. The battle of the Cilician Gates (where Alexander the Great defeated the Persian ruler Darius) sealed Septimius's victory over Niger and the effects of this change of policy brought to the Near East a new period of 'Romanisation'. A period when, at least on the surface, the region became romanized in a new way, and imperial interest in the region increased (Millar 1993: 124). The immediate consequence of this change, beyond the division of Syria into two separate provinces and the creation of two news ones (Osrohoene and Mesopotamina), was the treatment received by those cities which had supported Niger and those which supported Septimius. From that moment onwards, I shall argue that the relations between North Africa and Palestine in the Roman period begin to transform and establish different degrees of cultural interaction, as demonstrable through the systematic study of Roman oil lamps, one of the most popular media outlets of the period.

Fig. 40.Single currency with the representation of Gabinius found in the region, Syria[44]

[44] See http://antioche.cgb.fr/0001.html

Those cities that had supported Septimius, such as Tyre, Laodicea and Heliopolis (Baalbeck) were rewarded with the rank of metropolis, *colonia*, and the privilege of the *Ius Italicum*; while those which supported Niger suffered a loss of status, as is the case of Antioch itself. The title of metropolis means that a predominance over neighboUring cities of colonial status was exercised. Tyre received this honour when Septimius came to power, which according to an inscription, considered the place as its mother-city, probably as he was a native from Leptis Magna, a Phoenician colony in North Africa (Millar 1983: 55–71, esp. 66ff.; cf. Millar 1990: 37; Freyne 2004: 57-60).

Hadrian had already initiated the process of upgrading the status of the towns and Caracalla followed the same policy of honouring various cities in the region, which in turn led to intense local rivalries between cities. Thus, the eastern provinces and cities also began to assert their distinctiveness and independence from the western part of the Empire through religious proselytism, rather than just through political control. Their 'dominance' within the Empire was promulgated through sacred cults as opposed to temporal power (e.g. mystery cults such as Mithraism, Christianity, and civic religions like the worship of Syrian goddess and of Ephesian Artemis). The spread of eastern and mystery religions during this period was a major way in which the East claimed superiority and within the Roman Empire. The so called ‘Second Sophistic’ was not a planned programme; rather it was a cultural phenomenon that took place during the second and third centuries CE in which the revival of Greek rhetoric and philosophy, allied to eastern mythology and paideia, re-asserted the unity of the Empire in Greek speaking terms, consolidating the grounds for eastern religions to spread more effectively. The propagation of such cults was achieved through the production of highly symbolic icons and iconographies which relied on a reconstruction of the past with new meaning (Elsner 1997: 179).

Archaeology has played an increasing role in the reconstruction of Roman Palestine, but it would be artificial to create an edifice where to the complexity of the region and period it is necessary to move in many cases from Archaeology to text and back again for a better understanding of the contexts under study. text experts stand on one side and the archaeologist on the other (Edwards 2004). The expression of social identity is not a static mechanism and objects can be actively manipulated by people in order to create, express or define social identity. Although there is not necessarily a straightforward association between artefacts and identities, social identities change through time and have deep economic and social implications that can only be elucidated through careful analysis of contextual material (Eckardt 2002: 33).

The social usage of light equipment can be related to the visual propaganda of iconographically idiosyncratic eastern icons, and can also can be understood as resistance to Rome. Resistance during this period must be explained because it must be defined as linked to the provision of religious identities in an empire-wide sense, rather than as just fomenting rebellion as in the case of the Jewish wars. It was not a process of overt resistance, but an incorporation of the charisma of the centre by upholding the imperial cult and creating a policy parallel to it, whereby the local religions of periphery and mystery cults, the normal rituals of Roman citizenship (Elsner 1997:180-185; Price 1984: 205-206; Tal and Teixeira Bastos 2015: 345-368).

The visual propagation of the cults through the empire was a particular feature of this use of sacred for eastern self-affirmation and pagan polytheism in the east during and after the second and third century CE. In contrast to naturalistic styles and iconographies, accepted in the regions, the self-assertion of the east was an appropriation with universalist and centralizing religious techniques created by cults and rituals that spread in a variety of polytheisms (if we consider Jesus, Mitra and others as just one more god in the Roman Orbis competing for devotees). But also, economically speaking, a clientele to whom the lamps were destined to marketed.

The worship of Ephesian Artemis, Serapis, Cybele and Attis, Mithras and Jesus were promulgated on an empire-wide bases. These local religions and mystery cults from the empire's eastern periphery relocated the centre of power away from Rome by providing religious identities for the universal spread of these cults, as happened before with the transmission of the imperial cult. Indeed, it can be considered as strike back at the state-propagated imperial cult and a re-appropriation of its sacred and civic spaces (Elsner 1997: 195-196; Price 1984: 130-131). By the second century CE onwards devotees of eastern cults (e.g. Artemis Ephesia, Mithraism, Christianity) could see the core of the Roman world focused around the sacred centre where their gods/goddess dwelt rather than in the political centre of Rome. Therefore, cultural resistance to Romans could be expressed as devotion to deities from the periphery, a marked feature of the polytheistic east in this period, as one of the main ways to deny the temporal and domain realm. The iconography and offers of salvation carried cosmic allusions and spread throughout the whole Empire with the claim to universal sovereignty.

Articulated by differences from Rome, the icons and suppression of their representatives, were a principal expression promulgated throughout the region, in a world from which pagan cult images served as the centre of a sacred nexus for defining identity, mythology, locality, and social

cohesion and collectivity. Early Christianity, Pausanias, Mithras and others social-religious groups had universal claims, missionary expansion, and some kind of particular and exclusive access to forms of salvation whose value lay beyond the present, with a strong emphasis on the ritualization of space and time. The iconography related to these mystery cults often depicted astrological, typological or mystic symbols, proclaiming in this way both the universal and peripheral origins of the cult (Elsner 1997:196).

Thus, the appropriation of the Roman centre by Christianity after the fourth century was a typical instance of using the drive and energy of an eastern cult to inject new life into the old religion. A marker of cultic identity, this was basically motivated by visual competition with the symbols of other cults, and methods from the cults supplanted by Early Christianity, all competing in the cultural arena (Elsner 1995: 280-287).

The set of aspects that collaborated with the acceptance process of Roman rule and its cultural consequences were the oil lamps. The Imperial or Augustan oil lamps scattered throughout the Roman Empire, possibly due to their brightness, address the appearance of metal oil lamps, which had more value and higher status in the market. This type of fine craftwork did not spread tas far as the production and trade of clay lamps. Metal oil lamps reflected the interaction of light with the brass of the object creating a sense of animation, but both types produced the sensation of the shadows 'dancing' on walls and floors.

Fig. 41. Imperial Roman oil lamps.

In Palestine two main types of Imperial oil lamps were found: the first with a short triangular nozzle and the second with a narrow round nozzle. Variants of these types may have handles, but there are exceptions. A small quantity of these lamps were found in Israel, which might reflect a limited demand and imports over just a short period, as well as some gradual Romanization process of the light industry in Palestine. Most samples were found in the major cities of the region, founded and dominated by Roman culture during the late first century BCE and early first century CE (e.g. Tiberias, Caesarea - administrative and commercial centers -, Dor, Akko and Ashkelon - seaports -, and Sheik Badr, Armenian Garden in Jerusalem where legions were stationed).

The local industry of oil lamps in the East was primarily affected by the penetration and conquest of the Greeks in the Hellenistic period and later by the Roman conquest of the region. The production of oil lamps in Greece flourished after theRoman conquest, as a result of free citizens who lived and worked in Corinth during the first century CE. Roman lamps were adapted and gained a central role in the Greek light industry during this period. Although this represented a change in dominance, since the Roman lamp industry had initially been dependent on the resident Greek artisans in Italy.

The emergence of an industry based in Corinth led to the improvement of production, based mainly on the Hellenistic heritage, incorporating new elements. The result was a production of high-quality oil lamps, difficult to distinguish from the Italian specimens. In some cases one can only differentiate between them by the workshop's signature on the lamp base. From the third century CE onwards, production in Greece moves from Corinth to Athens. In its initial period in Athens the oil lamps resembled the Corinthian types, but during the fourth century CE it is possible to note a new wave of emerging decorative styles based on linear reliefs, under the direct influence of art practiced in North Africa (Sussman 2012: 62).

Despite the independent development of Western productions during the first century BCE, local productions in the East, especially from Antioch (Turkey), Phoenicia and Jerash (Jordan), began exporting their productions to Palestine, competing in the markets with Greek producers. Hence, the latter part of the first century CE marks a decline in imported Roman clay lamps and the consequent “levantinization" of regional production.

In contrast to the Hellenistic models, Roman period lamps have the nozzle as an addition to the closed and fully circular receptacle, creating the effect of being an external component, wherein

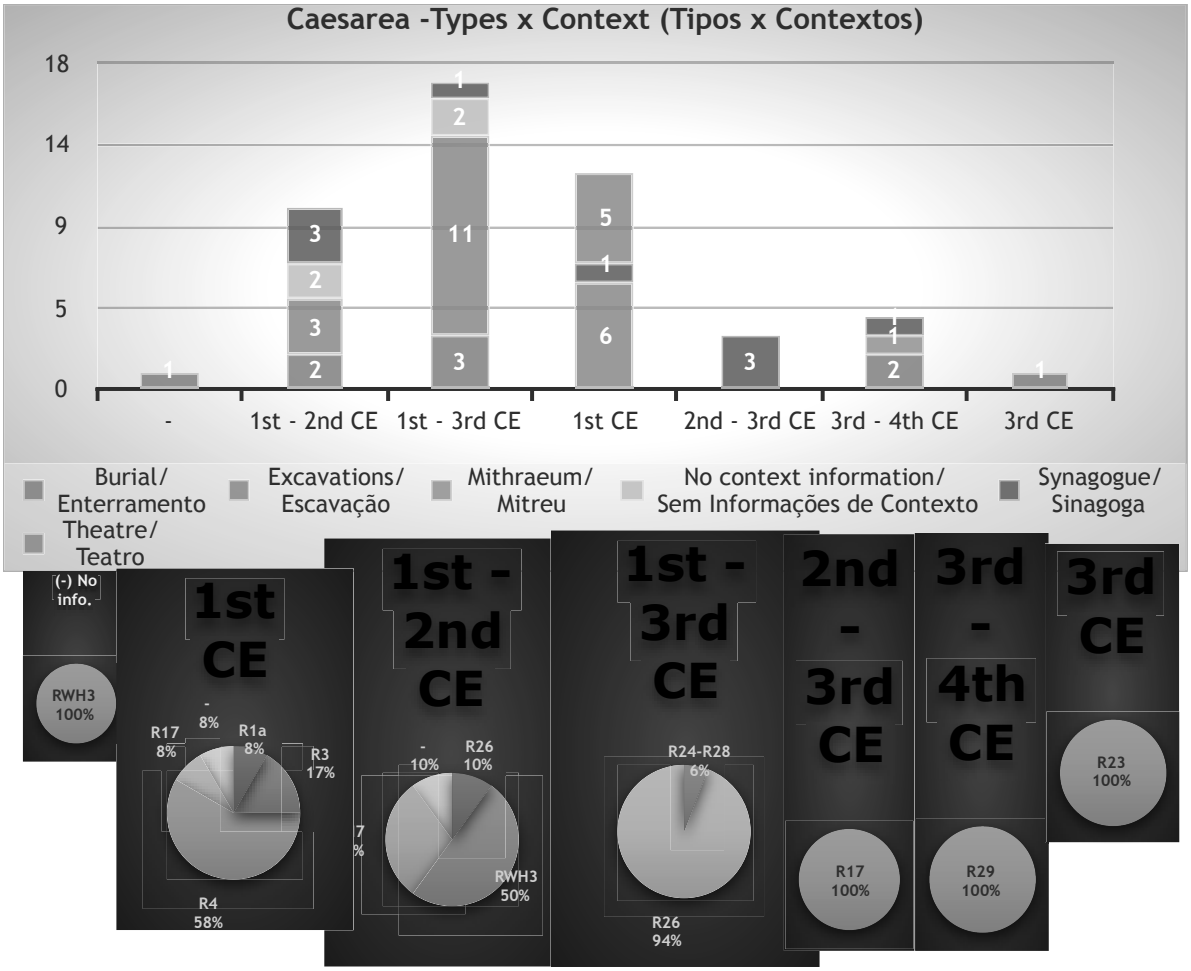
the volutes make the connection to the body of the object. The nozzle shape also changed and became short or long, compared to the previous Hellenistic models. The format of the volutes differs among the many types of lamps of the period and can be considered an adaptation of the Hellenistic models found in Ephesus. In Palestine, it is possible to infer that the regression of the width and depth of the nozzle is a general marker of chronology; thus extending the edge and/or edge as well. The expansion of the edge provided an additional area for decorations, such as a frame, or the so-called ‘mirror' (Sussman 2012: 12).

Among the imperial oil lamps found in Israel it is possible to establish a chronological division based on differentiation between the nozzles that were found in Bet She'an, Caesarea and O'boda (see, Sussman 2012: 11). After the first half of the first century CE, the nozzle loses the volutes that were bordering it and the lamps have a more pear-circular shape (Type C, V Group Bailey 1980: Pl.25). The addition of the handle would be a phenomenon of the last decades of the first century CE (Type A, Groups V and VI; AV and AVI Bailey 1980: Pl. 8). As in the Hellenistic lamps, many Roman oil lamps had the brand (or signature) of the fabrication workshop on the object's base, known as the *Planta Pedis*. One of the first signatures found on these lamps was the Greek word XARIS. Most common local lamps of the late Roman period were signed only by initials or an abbreviation, differing thus from signatures in Latin or Greek, most common during the period. However, signatures such as FAVSTI (in Greek letters) seem to have reached the Eastern markets and copies of those lamps were found in Caesarea, O'boda, Masada, Petra and Delos. In Beirut, of 24 oil lamps with signatures, 12 had the FAVSTI (Faustus) workshop’s mark. The FAVSTI signature is attributed to a potter who lived and worked in Italy during the late first century CE and is reputed to have immigrated and established workshops in the Levant, Petra, Egypt and possibly Cyprus (Oziol 1993: 34). This signature is also attested in locations distant from each other, including Sabratha, Tel Anafa, Petra, Antioch, Hama, Beirut and Tyre (Mikati 1998: 129-130).

The distribution of oil lamps might have been affected by the quality of the product, but also administrative borders, which could have hampered trade in lamps, as well as factors relating to the demand, taste and identity of inhabitants. It is possible potters settled in the major urban centres of Roman Palestine to take advantage of the Roman aqueduct system for production purposes; once in Syria-Palestine the main sources of water are springs and active wadis. With regard to the decorative motifs of the pieces, embossed decoration went on to completely fill the disc with motifs

that range from the day-to-day worship of deities, political messages, sexuality, oriental patterns, and other parallels that can be found on Greek ceramic productions in the Megarian and East Samian. The decoration of the edges with patterns of circles, ovules and globes surely came from the Roman models and was reproduced in Palestine

Among the decorative themes on Imperial lamps with a short triangular nozzle found in Israel are: Nemesis (# 502 - Caesarea); Zeus (# 503 - Caesarea); four bearded faces (# 505 Caesarea); Diana (# 517 - Schick Zuweid); bull (# 488 Tiberias) and Satyr (# 484 - Tiberias). For the round nozzle lamp (with and without strap) the themes were: Leda and the Swan (# 36 - inaccurate provenance); Silenus and the moon (# 39 - inaccurate provenance); Eros (# 34 - Bet-Yzhaq Netanya) and composite scene (# 45 - H. Pain). In O'boda lamps were found with the intact disk. Thus, paleo Roman lamp imports lead to the conclusion that the population did not reject the figures portrayed on these lamps and/or the practice of avoiding human figurations and other representations until at least 70 CE (Sussman 2012: 13). The lamps were used in public buildings and were found in signficant numbers in the major cities of Palestine. Some of the most impressive Imperial clay lamps were found in the theatre of Caesarea and Bet She'an.(fig. 31).



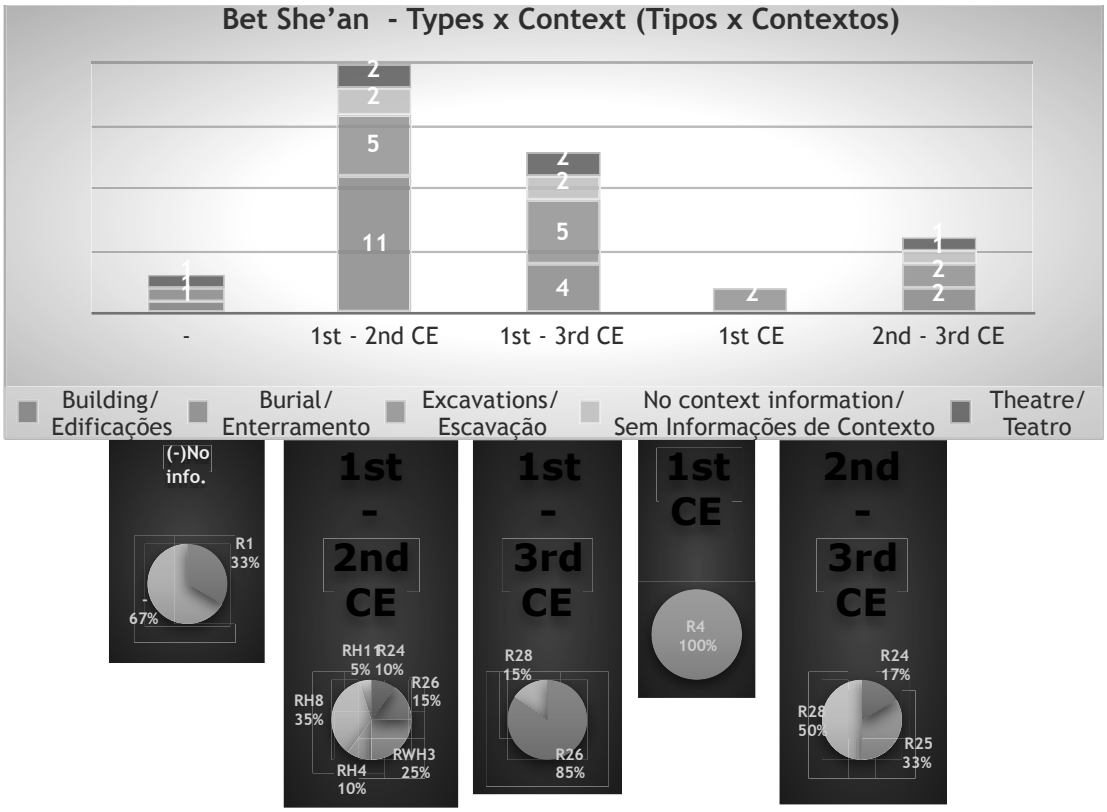


Fig. 42. Oil lamps types and context from Cesareia and Bet She'an.

If we take on board that the disks of oil lamps were not just the "mirror of the period", but instead, an object that portrays the idea and concept of meme, it seems possible to suggest that an image and its meaning were inextricably linked. I call meme a unit of information that multiplies between places (or from brain to brain) where stored information is combined with visual representation, in this case on clay lamps. It is related to the concept of fecundity of ideas that are especially effective or persistence over time with some fidelity of reproduction (Dawkins 2007). Basically a meme is propagated by imitation, hence always in adjustment to the subjects and needs of the present context, since it is constantly dealing with local and regional behaviours and ideas. Imitating means that the environmental element is another human (or a social group) from whom the right behavioural information is obtained and subsequently practiced. Behaviours and concepts acquired and propagated by imitation (memes) usually survive beyond the individuals and social groups that first carry them. Inherent replication is mutation, a modification of retaining systems that then become transmitted anew.

Under Roman influence, the Nabatean reproductions of oil lamps may strengthen this point. These lamps were traded side by side with the Imperial imports and other contemporary classes. Their lamps also feature signatures at the base of the pieces, with the difference that names of local

deities and the Aretas rulers were inscribed on the artefacts. Between Petra (Jordan) and O'boda (Negev) was the main trade route for the distribution of these objects in the region. The incense route, that links Saudi Arabia to the Mediterranean Sea, helped the spread of such pottery workshops (e.g. Sussman 2012: 24-27, types R8-R12).

Within the iconographic repertoire of representations contained in the Nabataean lamps (# 83, little sharpness) is a common representative pattern (leaves and diamond-shaped flowers). The most popular standard decorative patterns on Nabetan lamps is the Centaur (# 85, fig. X-bellow), a common figure of worship among many cultures in Classical Antiquity. In the Aegean and Italy the centaur was commonly portrayed in combat (with Amazons and warriors) and this figuration appears on many objects of representation, but only rarely on clay lamps.

Fig 43. Image of Centaur from Nabatean manufacture.

Another popular representation on the central disk of south Levant clay lamps during this period was the bull, a common decorative motif in the iconographic repertoire of Roman oil lamps reproduced in Nabataean. The bull representation, along with the double axes motif, have their origins in settlements at Crete - in which face to face a bull was perceived as a sign of bravery. The sacrificial representation of bulls appears on clay oil lamps found in Petra and these scenes were portrayed as sacred symbols on wall paintings, limestone ossuaries (coffins), capitals, and Minoan vessels (e.g. Neurath and Ellis 1965: 8-19). The figuration of the bull apparently is a decorative

element also found in funerary contexts in Ephesus (sarcophagus dated to 3-4 centuries CE) and in Bet She'arim (Avigad 1976: Pl.XLVII 1 and 2).

Oil lamps with lateral projections that resemble the letter omega instead of volutes were also manufactured in O'boda and Mampsis strictly related to the Nabataeans sites (1st-2nd centuries CE - Loeschcke Type V, Broneer XXIV; Negev 1974). The style was in fashion at the beginning of the Roman period and the main difference between these objects and those under consideration in this thesis would be the lateral projections. This variant has a circular and large central disk that occupies virtually the entire surface of the piece, leaving narrow edges, curved and double notched. The stylization of the volutes is evident on the Phoenician and Egyptian productions, confirming a gradual process of internalization of the element. The small volute no longer projects beyond the body part of the lamp and is drawn up with the short and rounded nozzle. That would be one of the main characteristics of Syrian-Palestinian lamps indicating that during middle of first century BCE to first century CE local workshops grew in a process of connections between artists of the Nabataean kingdom, Phoenicia and Egypt (Sussman 2012).

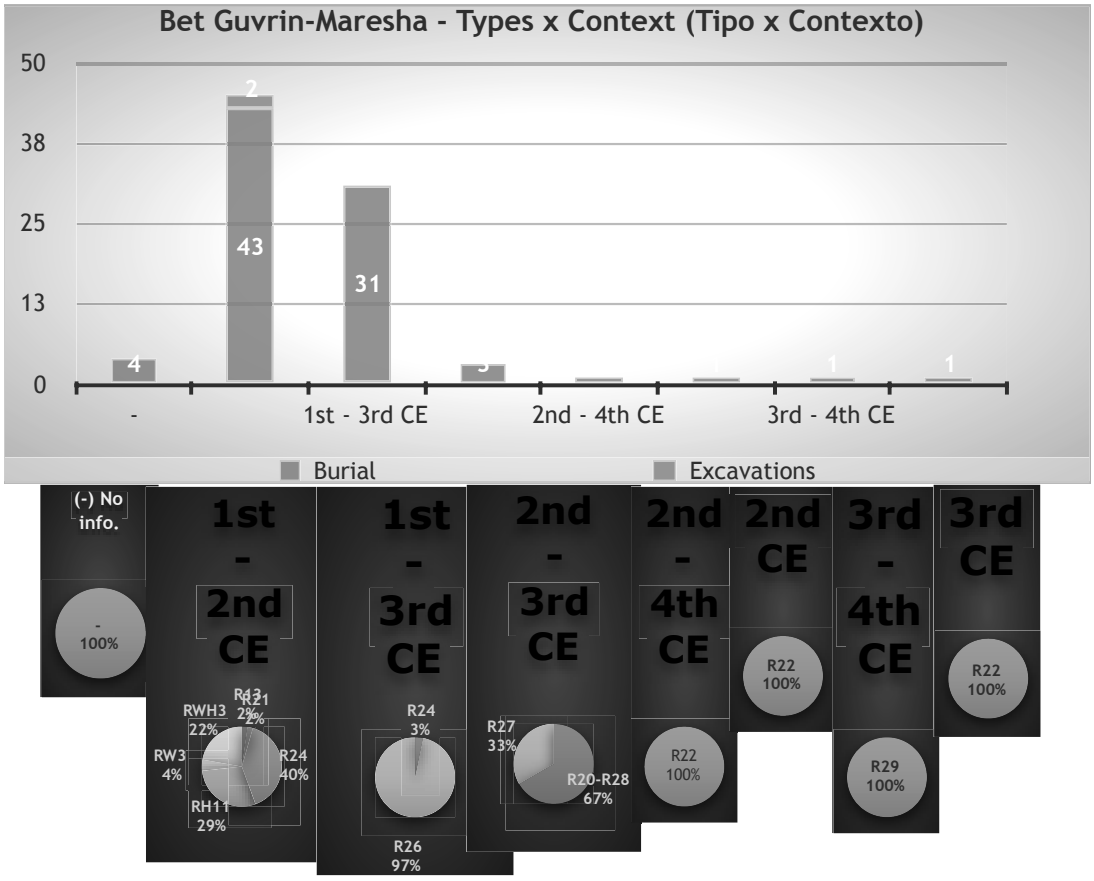


Fig. 44. Oil lamps types and context from Bet Guvrin-Maresha.

Among the lamps produced in Phoenicia found in Palestine between the first and second centuries CE, are those with triangular nozzles, clearly inspired by Imperial Roman oil lamps, with the volutes (also called ‘Ionic capital’). This model also has a double-axe decorative effect on the borders of the object. This decorative pattern was very popular among the copies from second half of the first century CE onward, and possibly served as one of the strongest elements of identification of Phoenician workshops during Late Roman period in the region. The earliest examples of such lamps were found in Sajur, Ramat Hanadiv, Khirbet el-Shubeika, Sha'ar Ha-‘Amaqim, Bet Guvrin-Maresha. The deep connections between Bet Guvrin-Maresha and Phoenicia are attested since the Hellenistic period (Sussman 2012: 35-40). Another model with origins in the region of Phoenicia which has close relations with the models studied in this thesis are those that have been found in Tel Dan, Nahariyya (# 138), Apollonia (# 140), Tyre and Omm el-'Amed (Phoenicia). These lamps were produced under the inspiration of Imperial lamps, but with further influences from the Italian 'factory lamps' (Loeschcke type VIII and type Bronner XXV), dated between the first and second centuries CE. On these lamps a figuration of the dolphin appears, which represents either animal friends of men, companions on sea travel, solidarity and assistance, or the assistants of Charon during the crossing of the dead by the waters of the Styx and Acheron to the safe haven.

In addition, the figuration of the dolphins may have other mythological resonances. They can be connected to Apollo and Dionysos Delphinios who turns pirates into benevolent dolphins; but they are also connected with Aphrodite and Eros, often shown riding a dolphin, and with the sea god Poseidon. Mythological affiliations may have been intentionally open thought this does not mean that they did not also have a religious reading. The Roman oil lamps commonly present heavenly reasons to mark any elemental affinity. Dolphins could enhance the splendor and luminous nature of Theos Hypsistos, praised by filling the universe with light (Bielfeldt 2014: 183-184).

Fig. 45. Lamps with representation of dolphins produced in Phoenicia with the double-axe (Sussman 2012).

During the second and third centuries CE a type of oil lamp containing geometric and egg decorations flourished in Phoenicia. They were produced on a large scale and have parallels with Western 'italian factory lamps' with signatures on their bases. It is interesting to point out that these lamps have decorative features that existed in the East and West in the Roman world. Examples of this type of lamp were found in Nahariyya, Moa, Meiron and Shiqmona. These clay lamps were also found in Tarshiha, deposited in a burial with coins which are dated to the end of the second and first half of the third century CE. Another burial in Tyre with coins dating from the middle of the second century CE (136 CE) to the third century (213 CE) were associated with these lamps. The use of Greek letters in signatures also indicates the third century CE as the period for this production. In addition, the existence of ceramic furnaces placed in Kh. 'Eitayim, Phoenicia, suggests that this was the place of their manufacture (Sussman 2012: 44). The burial at Giv'at Katznelson, Nahariyya, reinforces the connections to Phoenicia. Interestingly, these types of lamps in Palestine appear broken in the central part, indicating that intentional breakage was already established during the third century CE in the region (Tal and Teixeira Bastos 2012).

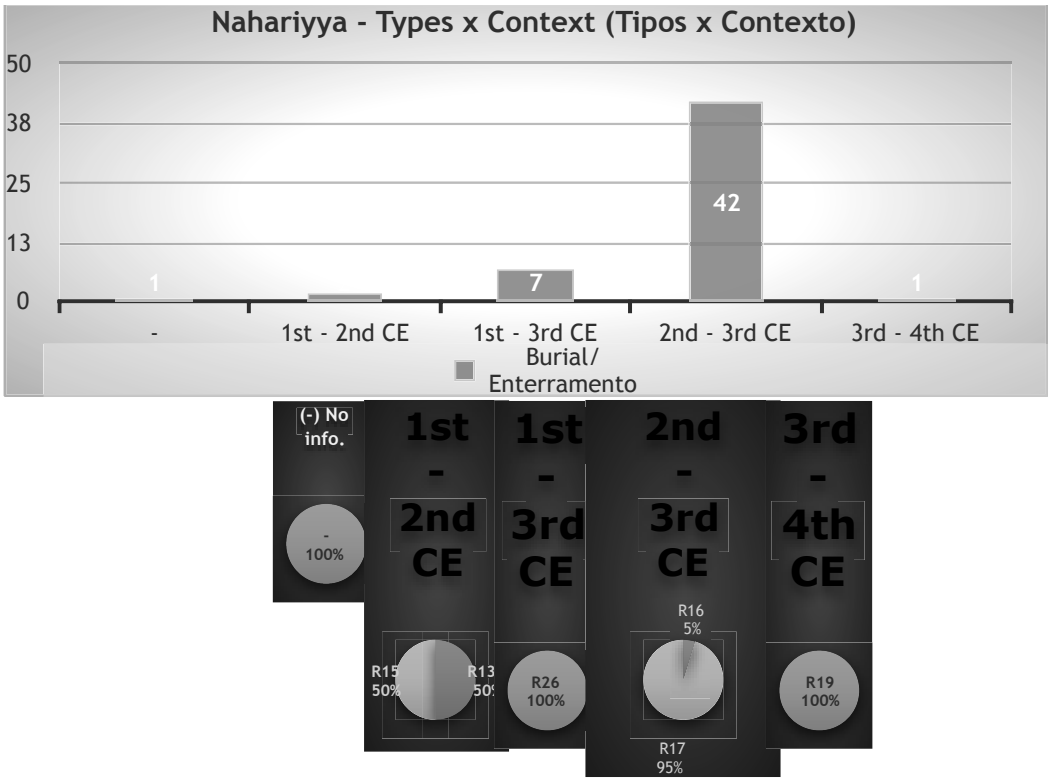


Fig. 46. Oil lamps types and context from Nahariyya.

Roman lamps were manufactured right across the Roman Empire, and Imperial lamps with short nozzles appear in small numbers in Israel, and are present in Tunisia, North Africa (Joly 1974[45]; 1995). All these lamps found in North Africa have relief decoration on the disc, in contrast to those found in Israel, and the bases of these lamps have the letter A (alpha), known as "alpha globule", dating from the first century CE. The number of lamps discovered in Israel has increased in recent years, and short nozzle Imperial lamps decorated and undecoration were found in Caesarea associated also with the Syrian-Palestinian lamps (Zemer 1997: 42). More examples were found in Maresha-Bet Govrin (dating from the late first to the third century CE), in Qasarwet (South Sinai) and Jerash (Jordan). The same type of lamp was found in large quantities in Antioch, Syria, and Cyprus, and a similar pattern can be found in Tarsus, with evidence for a workshop and plaster casts. The Tarsus workshop was dated between the second and third centuries CE (Goldman 1950: 102-202, Fig 101, Group XVI.). This distribution suggests a coastal sea trade with the Maresha site, in the Lahav region, and the presence of such lamps in Lahav indicates that the site and the region

[45] Sabrata, Pls XXIV: 637, XXV: 668, 672, 683 and XXVI: 688-696)

maintained connections to the north of Syria and Phoenicia, playing an important role in the Ashkelon port route into Roman Palestine.

The most important primary evidence for lamp use at shrines in Syria-Palestine has been recovered at theatres, amphitheaters, military installations, and foundation deposits. Roman Imperial lamps were found in the Theatre of Caesarea (5) and Beth Shean. In amphitheatre sanctuaries, ninety-seven complete or nearly complete lamps were recovered from the lower chamber of the *sacellum* of the amphitheatre at Beth Guvrin (Kloner and Hübsch 1996:101-102)[46]. A significant quantity of lamp fragments were also recovered near two Roman altars in the upper chamber of the *sacellum*. The lamps date to the mid-third and fourth centuries CE. Their presence in this context indicates that they were used during the rituals observed by the gladiators. Although the first phase of use of the building dates to the second century, the lamps were used in the building's last period of occupation, in the late fourth century CE.

Lamps at the *sacellum* at Beth Guvrin were far fewer than those uncovered in the cult place at Caesarea, which was constructed in the late 1st century BCE and ceased to be used in used in the 3rd century CE. All lamps found had traces of burning, and two fragments of the Beit Natiff variety bear a seven-branched menorah (a lamp) flanked by an incense shovel and either shofar or an etrog (Kloner and Hübsch 1988: 102, fig. 23, n.9). Outside the original east wall of the amphitheatre a fill contained considerable quantities of early Roman pottery, which includes two Herodian lamps and a third "Augustan" type lamp nozzle with a partial central discus and coins (Porath 1995: 23 and 271, fig. 12)[47].

Shrines of military installations were found in Tel Michal and represent a strong case where lamps appear to have been deposited as offerings (Derfler 1989: 191-193)[48]. It was suggested that Rooms 58 and 912 had an official function, either as offices or a praetorian (adjoining camber); or, perhaps could be the sacellum, the shrine of the fortress, dated to the first half of the 1st century CE, based on the pottery and numismatic evidence. Four Herding lamps were found associated with this context (Derfler 1989: 192). In Qasrawet Late Roman-period discus lamp bearing the image of a

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[46] Amos Kloner and Alain Hübsch, "The Roman Amphitheater of Bet Guvrin: A Preliminary Report on the 1992, 1993, and 1994 Seasons," 'Atiqot 30 (1996), 101-102, fig. 25. ; Amos Kloner, "The Roman Amphitheater at Beth Guvrin Preliminary Report, " IEJ 38 (1988), 15-24

[47] biblio See Porath, "Herod's Amphitheater at Caesarea", 23 and 271, color fig. 12.

[48] Steven Derfler, "Roman Fortress (Stratun II)", in Excavations at Tel Michal, Israel, Tel Aviv Univ. Sonia and Marco Nadler Institute of Archaeology, Publications of the Institute of Archaeology, N. 8, Ze'ev Herzog, George Rapp, Jr., and Ora Negbi, eds. (Minneapolis, MN: Univ. of Minnesota Press, 1989), 191, 193, fig. 14.3, nos. 13-16.

seven-branched menorah with lulav and shofar, and two lamps with Christian crosses were found (Oren 1982:235-240)[49]. In the military installations at beer Sheba, Betar, el-Lejjun, Massada and Qasrawet additional clay lamps were found (Lapp 1997: 199-201).

Lamps were recovered at excavations in Jewish synagogues from Capernaum, 'En-Gedi, Hammat Tiberias, and Khirbet Shema. At Khirbet Shema a lamp fragment belonging to the Caesarea round class was recovered from the genizah of the synagogue. Lamp fragments, the glass and coins indicate that the genizah chamber was in use throughout Strata III-IV (284-419 CE). Three glass lamp bases were found within the worship area of the synagogue, this would suggest that glass lamps were the chief means of lighting the interior space of this building, probably hanging from the ceiling of the synagogue (Meyers et al 1976: 270[50]; Lapp 1997: 205). The greatest use of the genizah probably took place in the mid-4th century CE (Stratum IV, 306-419 CE). A second Caesarea round lamp was recovered from the synagogal context At 'En-Gedi. This lamp was decorated with floral patterns and was found in situ in a niche behind the Torah shrine of the synagogue. Thus suggesting Caesaran round lamps were used in synagogues to provide light in the genizah. At Hammat Tiberias lamp iconography and the synagogue context match. Several of the lamp fragments were found in the synagogue in an earlier (IIb) phase of occupation, mostly belong to the bilanceolate group. Fragments belonging to the variety of lamps with bow-shaped nozzles depicted menorah on the nozzle. These clay lamps were recovered from the floor of locus 52, the treasury of the synagogue (Dothan 1983: 65, fig. 5; Lapp 1997: 203-205)[51].

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[49] Eliezer D. Oren, "Excavations at Qasrawet in North-Western Sinai: Preliminary Report, "IEJ 32 (1982), 203-211; David Ussishkin, "Betar: The last Stronghold of Bar Kochba," BAIAS 6 (1986-87), Discovery," JRA Supplementary Series 14, John H. Humphrey, ed. (Ann Arbor, MI: Journal of Roman Archaeology, 1995), 235-240.

[50] (Eric M. Meyers, A. Thomas Kraal, and James F. Strange, Ancient Synagogue Excavations at Khirbet Shema", Upper Galilee, Israel 1970-1972, ASOR Annual 42 (Durham: Duke Univ. Press 1976), 270 and pl. 8.9, n. 7).

[51] (Moshe Dothan, Hammath Tiberius: Early Synagogues and the Hellenistic and Roman Remains (Jerusalem: Israel Exploration Society, 1983: 62).

Fig. 47. Amphitheatre Hamat Tiberias, the Sea of Galilee.

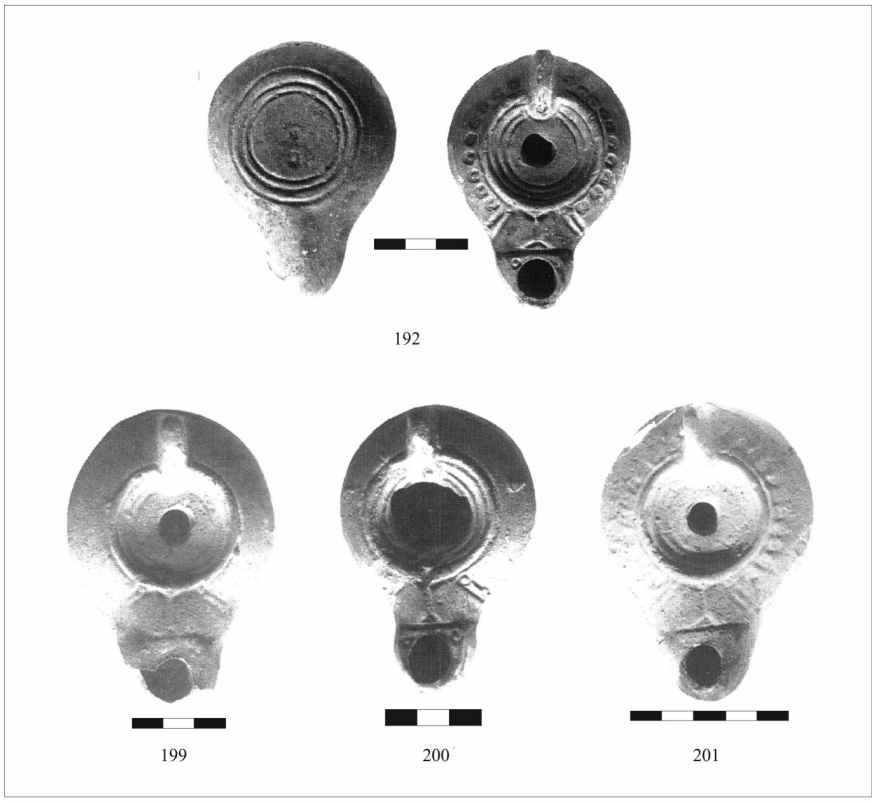

Fig. 48. Oil lamps from Hamat Tiberias, the Sea of Galilee (Lapp 1997: 329).

At Capernaum lamps depict a floral rosette and probably a crab or ibis motif and several other classes of lamps from the Hellenistic types to Late Roman fragments (Loffreda 2002: 70-72, fig. 6, 7 e 9). Most of 9 lamps found in the Caesarea Synagogue are Sussman type 17, many disks of these lamps, like other lamps seriated from this model, were intentionally broken; although they were not decorated like the two lamps with a complete disk found in Mampsis (Sussman 2012: 43). The distribution of these lamps is restricted to North Israel and Phoenicia, with the largest number found in or close to Phoenicia[52].

Clay lamps were largely present in burials, catacombs and tombs in Roman Palestine. Jewish tombs at Beth Guvrin revealed that a significant number of tombs had been reused during the first to fourth centuries CE. Secondary burial among the tombs is an unknown custom in the Hellenistic necropolis of Maresha, although common in Jewish cemeteries, particularly those found in the Jerusalem area during the first century CE (Oren and Rapport 1984: 117-153)[53]. A vast system of underground caves in the region of Beth Guvrin and Tel Maresha, hewn in antiquity, served a number of cultural purposes, chief among them dwelling, burial, worship, storage, quarrying and industry.

In burial contexts of tombs N.III and N.V. on the Southern Cemetery of Marsha-Beth Guvrin, in a *kokhim* (on the floor of Chamber D) and inside a ossilegium (Chamber B, pit33), more than one hundred round clay lamps with decorated disks were found: ovolo, double axes, darts, and volutes in relief on the shoulders. Some twenty lamps had their iconography preserved, ranging from decorative leaves, crabs, ibis and crab, rabbit and bunch of grapes, and most interesting a bust of Helios on a crescent. The representation of Helios and the ritual related to his workshop seems to be an interesting topic approached by so called Syrian-Palestinian Round lamps (Sussman 2012: 58-72, type R26; Lapp 1997: 39-44).

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[52] The circulation overlaps the later Byzantine Northern stamped lamps, among the sites are: Jalame, Migdal ha-'Emeq, Kfar Ata, Shiqmona, Caesarea, Shuni, Tel Halif, H. Rimmon, Mampsis, Dor, and Antioch (Sussman 1989: 38-31,Type 3:10a and b, lamp 12; Hayes 1972, fig. 1). Paralel: Hartal 2006, Paneas, Fig. 10.8:13, Stratum II. Rosenthal-Heginbottm 1995, Dor, Fig. 5.24:3 and 4, Types 29.4 and 29.4, third century CE; Gophna and Sussman 1974, Tel Halif, Fig.4:9 and Pl. XXIV: 13, Sussman 2004, H. Rimmon, Burial Cave 3, Figs. 2:4 and 5: Fig. 6:5 and 2008, Caesarea, lamp 118; Aviam and Gorin-Rosen 1997, Hurfeish, p. 28, Fig. 3:1; Baruch 1997, el-Kirmil, Fig. 4:9; Kletter and Rapuano 1998, Khirbet Ibreiktas, p. 53, Fig.5:2, Locus 7. Tatcher 2000, Acre, Fig. 4:26 Stratum 2, Locu 114; Mazar 1973, Bet She'arim, Fig. 24:1; Vitto 2008, Qiryat Ata, Fig. 9:1 and 2, third-fourth centuries; Manzoni Macdonnell 1988, Jalame,Pl. 6-2: 40. Tatcher and Gal 2009, Migdal ha-'Emeq, kokhim burial Z, Fig. 4.; De Vinces 1994. Shuni Fig. 4:1.

[53] See Eliezer D. Oren and Uriel Rapport, "The Necropolis of Marsha-Beth Govrin", IEJ 34 (1984), 117, 153-2

Fig.49. Lamp produced in Phoenicia with the double-axe with Helium representation crowned by a solar halo (Ben Dov 1982: 199).

Thirty-one knife-pared Herodian lamps were found associated with broken ossuaries in several *kokhim* on the floor of burial chamber D and in a deposit of chipped limestone in chambers B and C. On tomb N.V. nineteen complete and fragmentary discus class lamps and five round to ovoid ones were recovered. Among the figurative motifs on the discus were scallop shells and a winged animal attacking a man, as well as the base of a fragmentary lamp stamped with the lamp maker's mark eta rho.

Only few clay lamps were found in the Christian tombs, in contrast with a significant quantity of lamps recovered from all of the Jewish burial caves. In the southern part of cemetery, the Cave of Menorahs, the Cave of the Columms and the Cave of the Inscription provide evidence for lamps with menorah associated with Jewish burial contexts and Christian associations with the Shephelah region. In the Cave of Menorahs two five-branched menorahs are carved in relief on the pilasters opposite the entrance to the cave. Lulavs and etrogs are carved in relief on each side of the acrcosolium, and remnants of a shofar are carved in relief decorations at the entrance wall to the left of the entrance.

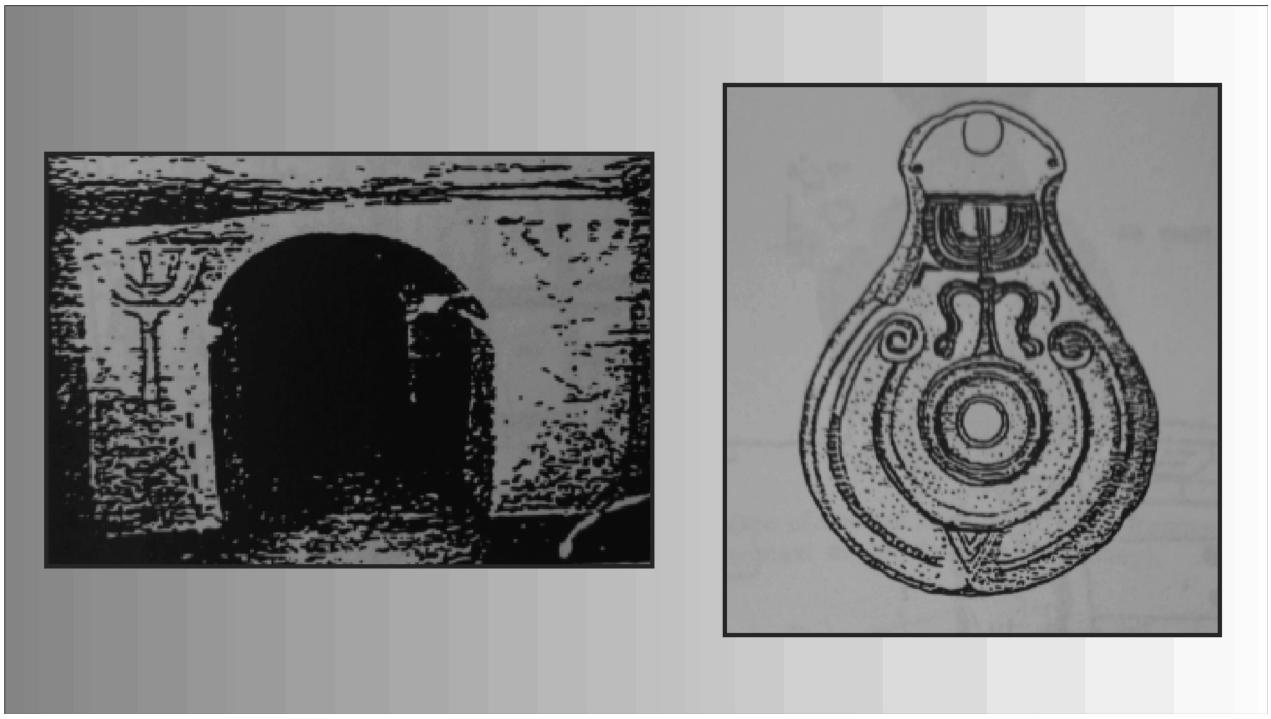

Fig. 50. Cave of Menorahs and oil lamp from the cave *in situ* Beth She'arim.

The lamps and coins found in the cave demonstrate that the tomb was used continuously from the 4th to 8th centuries CE. Most lamps recovered from the Cave of Menorahs belong to the bow-shaped nozzle class. A seven-branched menorah flanked by a shofar and an incense shovel decorates the lamp found in this Jewish burial context. The menorah depicted on the entrance of the burial was not in obedience to rabbinic law, as the seven-branched menorah carved in the wall of the tomb bears five branches, as noted before. In many respects, these burials are similar to some of the catacombs at Beth She'arim.

A significant quantity of oil lamp fragments were recovered from burials in the Cave of the Columns. Amongst hundreds of lamp fragments found in the cave, there is a fragment of a lamp adorned with a cross (Oren and Rappaport 1984: 127). Lapp (1997: 210) suggesting the 'abundance of bilanceolate lamps (well represented in Marsha-Beth Gruvrin) within the tombs at Pella, which has led some scholars to suggest that examples of this class were intended for burials, in addition to secular uses. In Pella (Tomb 39A) these lamps were probably used as funerary offerings as there are no traces of burning on the lamps. Lamps found in Jewish tombs from Marsha-Beth Guvrin suggest use as votive offerings, explained by the Jewish purity law of vessels used in the Galilee region in Mishnah. Lamps would became ritually impure in the burial context of a cave and were left in place or smashed at its exit. Although this does not necessarily mean they always smashed the Roman iconography on the disk of the lamp for burials, as the central iconography of a disk can be found in

tact in the same burial context as a broken lamp. Indeed, in a domestic context of Apollonia this phenomenon can be attested, including a scrape on the bust that decorated a lamp (Teixeira Bastos 2011: 260, fig.37, cat. 61).

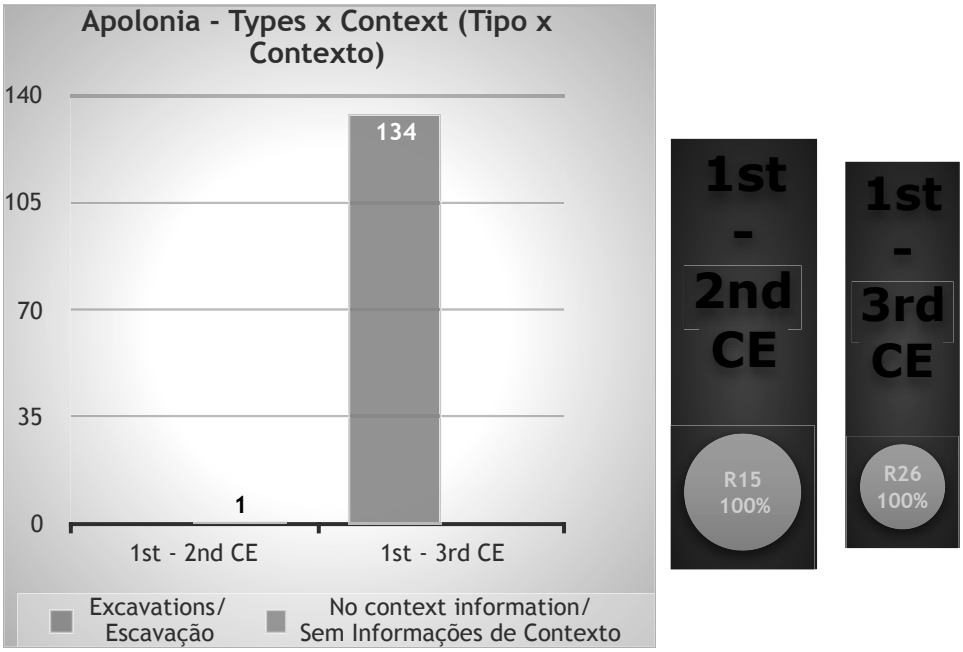

Fig. 51. Oil lamps types and context from Apollonia.

Lamps depicting motifs on the discus that include an erotic seven or a shell, several plain discs, and floral or geometric patterns on bow-shaped nozzle lamps were found in three burial caves in the area known as Akeldama south of the Temple Mount/Haram el-Sherif in Jerusalem. No menorahs or Torah shrines were found on lamps from these burials. The decoration found in these caves near Jerusalem is far more conservative and avoids representational art and Jewish iconography unlike the carved Jewish symbols at Beth Guvrin and Beit She'arim or the elaborate frescoes of the Jewish catacombs in Rome. Burial Caves 1-3 follow the local and arcosolia tomb plan.

A rich deposit recovered on the floor of Cave 1, Chamber A, included clay lamps, glass vessels, storage jars and bowls. The two rare glass vessels and an *amphoriskos* of Parthian origin (dating to the first century CE) found in Cave 1, Chamber D, led excavators to the conclusion that the family buried in Cave 1 probably came from outside Palestine. Several ossuaries incised with the Greek name "Eros" were found in Cave 2, and an ossuary found (room B) in this cave is

decorated with a bull (homed animal's head), above which is an incised Greek inscription: "Eleazar of Beirut made it"; while on a long side of the ossuary is incised the Greek inscription: "Belonging to Eros". It has been suggested this tomb belonged to an affluent and Hellenized Jewish family from the Diaspora bearing this name ("Eros"). In Cave 3 another twenty-five ossuaries with Greek or Hebrew inscriptions were found. Between those ossuaries a Greek inscription identifies its owner as "Ariston of Apamea" and most of the ossuaries bore names belonging to the Ariston family, another family from the Jewish Diaspora. Traces of cremation, a burial practice closely associated with the Romans, were found in the comers of room 1-B and in an ossuary in room 1-C, suggesting Pagan Romans also used the tombs for burial during the second phase, dating from the second to fourth centuries CE (Tall 1996: 55-72, figs. 3.1-3.23)[54]

Clay Lamps found in burials appear to be haphazardly placed, with the exception of a lamp between the legs of a skeleton in Kokh 7 of Tomb 1 at Huqoq. The placement of a lamp may indicate some funerary belief held by the person who had taken part in the burial. At Tarshiha, near Acre, and southwest of the Tomb of KingsNot, in Jerusalem, lamps are absent in the burials, which suggesting different attitudes by the relatives and visitors regarding the use of lamps as funerary offerings or as lighting devices.

Sixteen burial caves were excavated in the northern town of Migdal Ha-'Emeq in Galilee. These tombs dug into the rock belong to a large cemetery, which was used during the Hellenistic Roman, Byzantine and Islamic periods; a secondary use of the tombs was made during the periods of the Mamluks and Ottomans. The tombs of the Roman period are composed of *kokhim* and were sealed with rolling stone; later tombs are composed of arcosolia also sealed with a rolling stone. Among the lamps is a lamp decorated with a menorah. A total of 27 excavated tombs are from Midgal Ha-'Emeq (Thatcher and Zvi Gal 2009).

[54] Tal Illan, "The Ossuary and Sarcophagus Inscriptions," in The Akeldama Tomb: Three Burial Caves in the Kieron Valley, Jerusalem, IAA Reports 1, Gideon Avni and Zvi Greenhut, eds. (Jerusalem: IAA, 1996), 55-72, figs. 3.1-3.23.

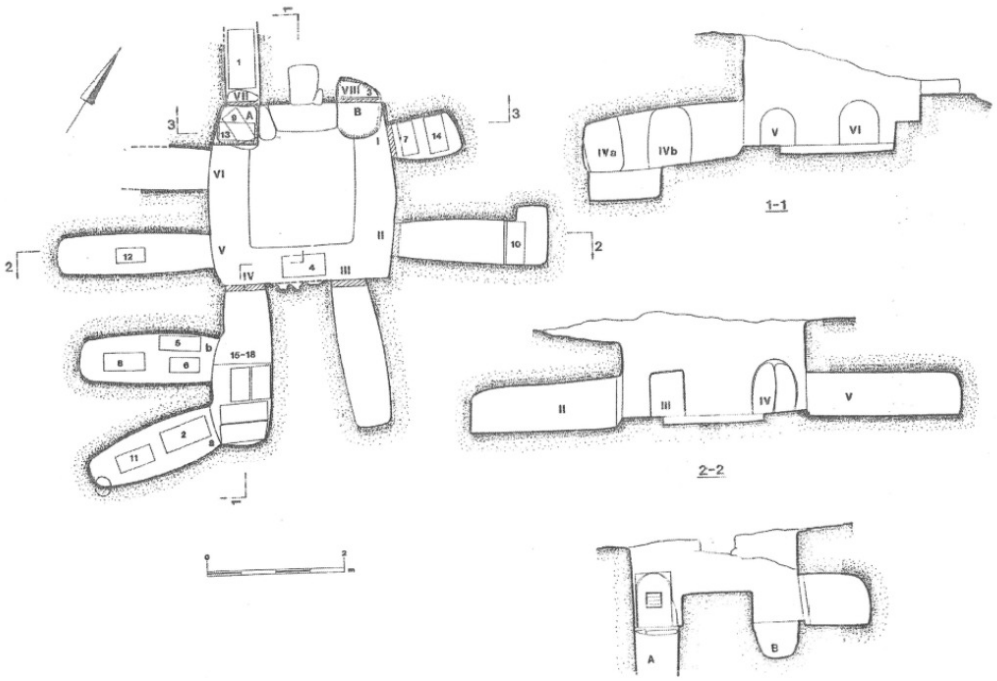

Fig. 52. Burial cave in Mount Scopus, Jerusalem (Sussman 1992).

The regions of Lahav and Maresha-Beit Guvrin in the Judean Shephelah have also lamps with signatures that refer to regions and cultural contacts with Egypt, Palmyra and Greece, which would have be extended from the Hellenistic period to the late Roman and Byzantine (Sussman 2012: 52) . Thus, Roman lamps with short nozzles were probably originally manufactured in Italy during the first century CE, but as they became popular in the Eastern part of the Roman Empire,served as models for derivative copies.

Pagan Shrines and Temples can be attested at the following sites: 1- Sanctuary of Paneas-Banias / Cesareia Philippi; 2 - Templo Horvat Omrit (Overman 2011)[55]; 3 - Temple of Baal Shamin, in Kedesh (Fishcer et al 1984)[56]; 4 - Beth Shean / Citópolis; 5 - Cave of Elijah, Carmel Mount; 6 - Dor; 7 - Caesarea Maritima; 8 - Samaria-Sebaste; 9 - Templo de Zeus Hypsistos, Mount Gerizim; 10 - Jerusalem / Aelia Capitolina; 11-*Témenos* of Elonei Manre and Me'arat Hamachpelah

[55] Andrew Overman, (2011) "*The Roman Temple Complex at Horvat Omrit: An interim report*"

[56]Moshe Fischer, Asher Ovadiah and Israel Roll, "The Roman Temple at Kedesh, Upper Galilee: A Preliminary Study", TA 11 (1984), 146, 169.

Asher Ovadiah, Moshe Fischer, and Israel Roll, "Kedesh (In Upper Galilee): The Roman Temple", in NEAEHL, vol.3, 859.

/ Tomb of Patriarchs, Hebrom); and other 13 sites such as Keren Naphtali / Khirbet Harrawi; Bethsaida; Hippos / Sussita; Tiberíades; Beset; Acre (Akko) / Ptolemais; Antipátrida (Aphek) / Antipatris; Jaffa / Jope; Beth Guvrin / Eleutheropolis; Ascalon / Askelon; Gaza; e Elusa / Halutza.

As in other parts of the Empire, the Roman lamps were copied into moulds made of wax, plaster or clay replicas and quickly began to be made in local workshops. At first, manufacturing was only partially successful as they were obviously inferior to the Italian productions. But they improved and the short nozzle Roman class lamps and so-called derivative Syrian-Palestian lamps became the most popular and dominant production line during the Roman and Byzantine periods. Such lamps are the largest groups evidenced in the Syria-Palestine province, found mainly in Palestine along with Roman imports (R1-R9)[57] and local productions, for examples at Herodian (RWH3), Darom (RH11), and a small number of neighbouring countries such as areas of Jerash (Jordan, RH9); Phoenician, Lebanon (R13-R14); Cnidus, Asia Minor (R20); Nabataean, South Jordan and South of Palestine (R23).

During the Roman period the huge variety of oil lamps achieved its peak: clear demonstration of the competitive and diverse cultural arena established in Roman Palestine. The production mainly of the so-called Syrian-Palestinian lamps (R26) sought to meet the local demand for Western-style lights, and despite the name (Syrian-Palestinian), the location of the workshops producing these lamps has never been established using geographic-distributive sampling, until, that is, this work here. Lapp (1997: 39-44) and Sussman (2012: 58-72) systematized previous studies, with a definition for early manufacturing (R24 and R25) and later manufactures (R27, R28 and R29) for this clay lamp class, marking an important development of the light industry in the East Roman.

The models were made of good quality clay, well levigated and pinkish-reddish (Munsell 5YR 7/6; 10R 5/10 and 6/12 2.5yr), to yellowish-green or orange (Munsell 5Y 8 / 3-6 7/8 5yr and 10YR 8/6), and brown-dark or buff slip (Munsell 10YR 10YR 3/2 and 4/4). The R24 type (A and B) does not have any decoration on the disc, while R25 -R26 types always contain the relief decoration. This is one of the main differences between these types. The R24 lamps are short with small volutes bordering the nozzle and a stamped based *Plant Pedis*. In type R25 the nozzle is raised slightly and the interior decoration of the disc and edges follows standards known in the West. These elements help to locate this productions in an earlier phase than R26 type. The dating

[57] See all types in Sussman 2012.

of these productions is between the first and early second century CE. These lamps may have been in use during the first decades of the production of R26 or even later. They appear less frequently than the R26 type, but are usually associated with them. The sites where R24 and R25 were found are:

1) Burial near Caesarea cave with paint on the walls (Sigeleman and Ne'eman in 1992: fig.5: 1); 2) Burial in Shoham (1st-2nd CE) where the lamp was found next to skeleton legs (Nagorsky 2007: 47: Fig.3: 9); 3) Burial in Pisgat Ze'ev with *kokhim*, just outside Jerusalem (Shurkin 2004: Fig. 21: 1); 4) Burial cave in Beit 'Anun, Mount Hebron (Magen 2008: Pls 1: 1, The cave and Pls.3:. 6, Cave B); 5) refuge cave Revolt Bar Kohkba in Wadi Ed-Daliyeh, Negev (Eshel and Zissu 1998: Pl. 4: 7-8); 6) Huqoq associated with the Herodian and Phoenician lamps - R29 (Kahane 1961: 129-130, fig: 3: 23-25); 7) Bet She'an (Fitzgerald 1931: Pl XXVIII:. 1 and Hadad 2002); 8) Jalame (Manzoni-MacDonnel 1988, fig.6-2: 18); 9) El-Shubeika, Galilee (Thatcher 2002: Figure 1: 1); 10) Tel Mevorakh (Stern 1978: Fig. 2:20, Stratum II-III); 11) Antipatris (Neidinger 1982. Pls 22 and 23); 12) Tyre (Le Lassuer 1922 fig.9 a-d); 13) Qumran Cave 4, Negev (De Vaux in 1977: fig.6); 14) Wadi Muraba'at, Negev (Benoit et al Fig 8:13)..; 15) Amathonte, Cyprus (Abadie-Reynal 1987: Pl XXIX:. 5. T.190 / 6 and 10, T.236 / 34).

The decorative patterns on the border accompanying the R24 and R25 types usually include some of the following isolated elements: eggs, palm trees, double-axes, dolphins or flat (without decoration). The R26 types differ therefore from R24 and R25 in that they use a combination of these decorative elements on the lamp: for R24 it is rare to find a combination of these basic decorative elements. For R26 the pair of volutes is reminiscent of the 'Ionic capital'; thus, an outstanding feature of this type. This decorative element has been known since the latter part of the Hellenistic period, having its roots in models from Ephesus, and Imperial roman lamps, as well as influences from local models from Judea (Daron type), and from Jerash and Phoenicia.

The double-axe is the most common decorative elements on R26 types, but is also found on types R24 and R13, Phoenician types. The decorative pattern always appears in the centre of the edges, alone or in combination with other decorative elements. This constancy suggests a specific symbolic meaning for the representation. The symbol is present in many artistic works of Antiquity, and its evidence in Crete during paleo and middle Minoan period in association with bull horns can be noted carved on the walls of royal palaces. The double-axe was found in burials in Knossos combined with votive offerings. These burials were known as "double-axes burials" and indicate the

sacredness of the symbol. The way some decorative double-axes are designed on small lamps (in the form of bonds) suggests its association also with the "holy knot" from paleo Minoan period (Sussman 2012: 62-63).

The representation in the central part of the edges originates in Central Asia (Cnidian type) and was also present in Phoenicia, replacing the dolphin more usually portrayed. Nabataean lamps have a flower, the poppy, or four interlocking circles at the centre of the rim (R10 type). The Italian 'factory lamps' (R7) also show this effect, also those that were produced in Corinth and Athens (R19) during the 2nd century CE. In the Byzantine period the pattern still remains in local production Beit Nattif.

During the Hellenistic and Roman periods the double-axe became a symbol of Zeus, associated with lightning, so perhaps this factor is represented on lamps as a symbol of light. Eggs (as a patterned chain around the disk, probably using a stamp or a cylinder), and stylized palm trees (using the same technique) represented flames produced by the object. Palm trees representing flames were portrayed on lamps from the Hellenistic period, and the R26 type palm tree decoration appears in the same style as the Ephesus types (Sussman 2012: 64).

On the discs with decorative themes, only a few motifs survive that can be identified in Palestine, since these decorative patterns were intentionally suppressed in the artifacts during Antiquity. Among them are an amphorae in which a bouquet of flowers are growing; Leda and the Swan; the Griffin; the erotic scenes; Bustos; Diana; Aphrodite; Ivy riding on a bull; Pair of rabbits; Tree; a rabbit and a bunch of grapes; Eagle; Flowers; a Shepherd; Boar; Shell; Gladiators; Knight; Sacrificial scenes; Rosettes; Dolphins; Eros; Crab and Ibis; and finally Helium.

It is possible that a small portion of imported lamps served as models for local workshops who then further developed them. On the lamps made in the East, Helios, the sun god and the future, is pictured alone or walking on the moon; while on those from the West, when these figures appear, they are represented side by side and separated into separate lamps. Ibis and Crab are a popular motif on lamps, probably symbolizing good luck (or good fortune), and animals can be related to the flooding of the Nile and fertility. Thus, the bi-associative motifs Ibis-and-Crab and Bacchus-and-Chalice are commonly found on these lamps. As well as scenes of daily life, a few erotic scenes were found, mainly in large cities and seaports, including Ashkelon and Caesarea; and in the settlements of the Roman legions in Jerusalem and at the Nabatean sites (Stager 1991: 35-53; Bendov 1982: 202). Bichromes techniques were used to decorate certain discus lamps found in

Horvat Hazon, Sepphoris and Ashkelon that were slipped red in the central disc and a dark blue or black on the shoulders and body. The bichrome slipping technique may have served as a type of maker's mark used by a specific lamp maker or workshop. Other marks present on these lamps are bases that bear the sole or variant combination of the lampmakers mark of the Greek initial eta ("H"), the Greek initial alpha, the combination of Greek initials nu and alpha, a mark that resembles a Hebrew *shin*, and a tri-bud floral mark with curved branch and double-axes.

The subsequent models of the R26 type (respectively, R27, R28 and R29 - Sussman 2012: 67-70) maintained similar disc types. Typologically the R27 model does not differ in form and the main contrast is a half volute. This feature is also observed in the workshops of Carthage, especially in lamps of the VD type from the Hadrian period (Deneauve 1969: Pls LX-LXI). These small disk lamps with a half volute near the nozzle date from the second and fourth centuries CE. The gradual change in R28 and R29 types are related to shape. These productions took on a pear shape with a half volute design, and the R28 model has the nozzle slightly raised. Most of these lamps and their subvariants (R28: 1 and R8: 2) were found in the Jerusalem area, also encompassing Judea. They have been found in burials at Gibeon, north of Jerusalem, and in H. Burgin, Shephelah.

In general, it is appropriate to assume that the lamps found in burials were previously used in households, and subsequently placed on the graves of individuals (Sussman 2012: 61). Among the R26 type found associated with funerary meals, are copies of Mampsis graves, which were decorated with double-axes and flat edges. Lamps decorated with eggs and double-axes date from the last quarter of the first century (150-200 CE).

Oil lamps, thus, did not serve only for daily use, but also actively participated in sacred rites in temples and burials. Small lamps were found next to the kitchen ceramics on tables that served for funeral meals in burial rites in Palmyra, Syria, and the necropolis of Mampsis, Kurbub, that re-enforce this argument (Tarrer 1995: 165-182; Negev 1971: 111-112).

The lamp type R29 follows the pear shape and was produced in the late Roman and Byzantine period. Inspired by the R26 type features, the complete annexation of the nozzle to the limits of the receptacle was accompanied by oblique lines, such as on R17 (e.g. Sussman 2012: 42). Patterns that were in use on previous types of lamps gradually disappear, and some elements are conserved on the R26 model. The tendency to break the upper part of lamps may have led to the manufacture of lamps with wide open discs. At first glance, these lamps (e.g. found in Lahavot Haviva) seem to have been shaped with a large hole to fill with oil. However, a completely covered

lamp with no decoration on the disc can be found (Susman 2012: 71, Fig.55: 4). The gradual change of decorative patterns that surround the disc is accompanied by a decline in the quality and artistry of the pieces during the third century CE in these regions of Samari: this is in contrast with the productions of southern Palestine in Bet Guvrin and Beit Nattif region which have distinctive types of lights.

Moulds were recovered from Beit Nattif as well as unused lamps from two cisterns that represent evidence for a workshop (Baramki 1936: 3-10). The Beit Nattif lamp class manufactured three shape types: round lamps with a decorated discus (ca. 250-350 CE), lamps with a bow-shaped nozzle (second half-3rd to 5th CE), and ovoid lamps with a large filling hole (4rd to 5th CE; Magness and Avni 1998: 93-99). Numerous examples of Beit Nattif lamps with a bow-shaped nozzle were decorated with only geometric and floral designs (Rosenthal and Sivan 1978: 105-10, nos. 423-47) such as those lamps recovered from the *sacellum* in the amphitheatre at Beth Guvrin (Kloner and Hubsch 1996: 87, fig. 4; 101-103).

Fig. 53. Amphitheatre from Bet Guvrim.

Some of these lamps have signatures at the base, and instead of abbreviated names are incised with letters such as H and X and even a swastika. The moulds were probably made of plaster or lime and the decoration executed freehand, with a compass aid. The distribution of these lamps is mainly on the coast and central part of Palestine, Antipatris, Caesarea and Lahavot Haviva (this the largest Samaritan region) – main sites where these copies were found (Sussman 2012: 72). The dating of production is between the third and early fourth centuries CE.

It is interesting to note the similarities of trade in manufactured goods and changing influences in the Eastern part of the Roman Empire, despite very different cultural backgrounds. It emphasizes the question of what would have driven the increasing demand for lamps in the region with such diversity during Roman period. This is still an open question but it is possible to trace differences between the social-religious distinctions (including burial practices) from certain sectors

of the local population affected by the development and dominance of the Roman Empire. The industry of light was certainly affected by the changing influences and the constructions of private and public buildings, indoor activities, and the presence of a constant foreign contingent in the territory – all these aspects play a key role in how Palestine was lit.

9. Defining centres of production and patterns of distribution: social identities and economy.

The colonial encounter is mainly based on colonial texts that form the primary evidence for sociocultural anthropologists and historians. Archaeology can ascertain types of information that are independent and qualitatively different from colonial texts, addressing issues of cultural change. During the past decade, the theory developed by economists and economic historians as a way of conceptualizing colonial (and post-colonial) relations of power as a coherent global system, the so-called popular World-Systems or Core-Periphery theory, has developed within archaeological analysis. This American programme of research that attempted to categorize cultural responses to contact, especially concerned with changes in the culture of small-scale societies, served to systematize knowledge on a cross-cultural comparative basis to explain the political and economic dominance of Euro-American states. Within this broad concept, the acculturation theory and research programme was apparent in comprehensive typologies of material culture and contact situations and their respective responses, also for establishing uniform definitions of concepts for the colonial encounter process (Dietler 1999: 478).

In this sense, looking at a highly static and rigid concept of the nature of culture, the idea of "traditional" (by consequence primitive) societies as organically bounded unchangeable units, as a static process, seems unreasonable. Thus, the idea that change only happened when something was introduced by contact with the dynamic Western colonial societies doesn't seem solid enough to explain the dynamic of cultural chance. It is interesting that the archaeological attraction to world-

systems models has come about at the same time as its decline in cultural anthropology. Therefore, to analyse this complex socio historical phenomena it is necessary to examine defined cases in order to highlight both general and singular aspects of colonialism - that predate the development and expansion of Euro-American colonialism – from where most theories of anthropological theory are derived (Dietler 1998: 289). The true role for Archaeology is its examination of historical dynamics in a set of comparative perspectives using as many different contexts as possible, linked to synergistic archaeological research to better interpret colonial situations (Dietler 1998: 289). Roman oil lamps can serve as a case study for approaching changes in material culture within colonial dynamics in Antiquity.

It is not by accident that ancient Greek and Roman authors, symbols of the empire, religious literature, institutions and languages of domination, were associated with European colonialism, what was associated with ancient Mediterranean civilization. The expressed sentiments about the civilizing benefits of "Hellenization" and "Romanization" often served as a support for the ideological justifications of modern American-European colonial activity, as a result of a continuous expansionary process of a system that began over four millennia ago which is deeply ingrained within European culture today. However, culture must be understood as a way of thinking, of perceiving, and of solving problems, including the problems of incorporating alien goods, practices, and alien peoples, not only as something inherited from the past but something that is still going on in the present (cf. Braudel 1992; Dietler 1998; Frank 1993, Gills and Frank 1991; Sahlins 1985; 1994). Following these ideas, what I am trying to understand with this PhD is how structures of colonial dependency and domination may have created gradual instruments of power; as well as to understand the historical complexities of the "colonization of consciousness", the potential web of thoughts, and the role that material objects, especially Roman oil lamps, played in this process. This means I also have to try to understand how those objects were related to practices that can be triggered within a process of cultural entanglement and transformation, and how and why some practices and goods were absorbed into the everyday lives of people, while others were rejected or turned into arenas of contest. We must also pay attention to the context of consumption of those artefacts (Comaroff and Comaroff 1991; Dietler 1999: 484; Tal and Teixeira-Bastos 2015).

If we look only at the mechanistic articulation of modes of production and the level of economic microstructures of power, that would imply the use of models which succumb to various degrees of structural overdetermination and reductionism of the World-Systems theory. In other words, we would be confined to the uses of "core" societies analysis, in which History is

determined at the core, and where peripheries simply react to the actions (Dietler 1998: 298; 1999: 482). These types of approaches share an emphasis with an exploitative global division and macro-scale models of regional structural dependency that do not account for the diversity of counter-flows of material, finished goods and people in Roman Palestine.

Thus, the main idea is recovering a glimpse of the dynamic relationship between structure and agency, as well as wider implications for archaeological interpretation of culture contact situations. I will be focusing on the understanding of the historical complexities of the colonization of consciousness through manipulation, physical and symbolic, of oil lamps in this process. Although oil lamps are treated and reviewed within their broad economic context, a comprehensive treatment of the economy is beyond the scope of the present thesis. Local history and agency are situated within the larger political economy, but agency and structure are mutually constituting historical forces and have to be accommodated between consequential human action. This approach is looking to understand the process of cultural entanglement that resulted from material culture and propelled the uses of this material culture and this encounter, also the local experience that subtly transforms culture, the colonization of consciousness, and subsidize identity through the use of objects and ritualization of the space.

The history of Palestine can be perceived as an amalgam of forms of resistance and accommodation of spaces and structures of power with a complex contingent mix of shifting desires and cosmologies in interactions. Reductionist macro models with a centre of world system, or teleological mechanics of global structures of power, would not fit well for understanding histories of such colonial situations without making them seem ineluctable. Thus, the challenge is enhancing the possibilities to pursue the colonial encounter beyond the local and 'global' processes, by developing strategies for coming to grips with local agency, culture and history in the material record of the past (Dietler 1998: 308). More precisely, looking at how the indigenous societies, especially the Jews, Samaritans, Nabataeans, and Phoenicias, were drawn into larger relationships of economic and political power under Roman rule. Thus, in this work we are trying to socially situate the desires of their own member groups in the process of manipulation – physical and symbolic – of oil lamps in the past.

In the colonial encounter people use a web of contacts of their own political agendas, creating new meaning for things according to their own cosmologies, including foreign objects of interest that culturally had a specific meaning and can be perceived as a unity within the context of

consumption, where new meanings would also appear. The Roman oil lamps in Palestine have to be understood within this perception of colonial encounter, as a phenomenon of active transformation and manipulation played out by individuals and social groups with a variety of competing interests and strategies of action embedded within local political relations, cultural perceptions, cosmologies, and self-representations of the region. The intercultural adoption of objects or practices are interesting for their culturally specific meaning, and consumption has been recognized as a fundamental domain of practice for the development of colonialism.

Indeed it is necessary to explain the choices that were made and consequences of those choices trying to focus either on the symbolic logic and social action of consumers or on the efforts of marketers and vendors to shape and follow consumer tastes. We need to understand what goods and practices were available for appropriation but also which were ignored or refused, and why a particular pattern of selective consumption emerged from a range of possibilities.

A certain demand for oil lamps was never merely an automatic response to their availability, as any demand within the political economy of societies that follows consumption in specific circumstances – culturally conditioned by the political logic of evolution of tastes and desires of the local experience, and further more by the macro Roman colonial process in the East. Roman oil lamps served as models for practice, as reservoirs of symbolic raw material manipulated in the invention of traditions of cultural ancestry and religious-national historical mission. After the destruction of the Second Temple and the subsequent fragmentation of Judaism, and the reinforcement of Roman power, especially after 135 CE, oil lamps in Palestine turn into an arena of media representative of group identity and religious filiation.

Recently Brazilian scholars dedicated to the research of Roman Archaeology, have proposed a holistic approach to the archaeology of Israel during the Roman colonial period, allied to an examination of the literature resources of the period, which means Philo, Josephus, early traditions in Rabbinic literature (Torah, Mishna and Talmud), and Early Christians writings (Gospels, Apostolic Fathers and Apologists). Each of these literary pieces mentioned had its own agenda, selective, mostly anecdotal material and at times grossly or tendentiously exaggerated. Funari, and Chevitarese (ANO) have proposed this recent revision in Roman Palestine with the focus on a revision of the historical figure of Jesus and the movement related to his worship. A different perspective has been taken for Roman Archaeological research in Brazil, emphasising case studies

and strengthening the research field in the country (Fleming 2015; see pesquisas do Larp)[58]. In this sense, the archaeological research of oil lamps needs to scritinise the relative quantitive representation and spatial distribution of the artefacts, patterns of association of imported goods, as well as their consumption contexts, identifying specific local patterns of consumption and demand.

Lamps were used within the Roman economy to reciprocally transform economic and symbolic capital in multi-centric economies, making up networks that could be restricted along class divisions and naturalized through styles of consumption (e.g. Bourdieu 1984; Elias 1978; Goody 1982). A demand is always socially constructed and historically changing, a culturally specific phenomenon within the political economy and the politics of desires, in which symbolic manipulation of consumption plays a key role in the construction of identity. Selective processes meant that objects were accepted for exchange with colonial agents, pointing to relationships in trade and trust, but equally certain types of goods were exclused from this process. Thus, consumption in colonial local societies is also an interpretative strategy, a process at the intersection of local histories with larger Roman structures of power.

It is not just matter of counting the quantity of oil lamps to measure a purported process of "Romanization", "Judaization" or "Christianization"; equally a single oil lamp cannot be ascribed an identity of occupation at an archaeological site without more evidence of the context to indicate that identity. Instead, we need to understand the context of consumption in order to recognize its meaning and significance. The "levantinization" of the consumption of oil lamps is not merely a naively romanticized vision of unfettered indigenous agency in which consumption becomes an autonomous from of liberating appropriation and resistance. The focus is understanding the entangling operation of colonialism and the *transformation of consciousness* and identity, keeping in mind that there are always unintended consequences in consuming alien goods in society.

The market domination of such "fineware", or a demand for oil lamps, was a product of local tastes generated according to local cultural conceptions of economy, religion, ritual, identity, media and the social practices derivative from these ideas. Despite that, objects *per se* consumed across cultural frontiers do not themselves transmit the culturally specific meanings and practices linked to them in the original context of production. The majority of the sites analyzed indicate that

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[58] To the ethos of eastern Galilee beginning with the Hasmonean, see, for example, Leibner 2004: 352-63; Chancey 2002; Rappaport 2006:125-42; Goodman 1983; Oppenheimer 1991. About middle of the second century apparently the main centers of rabbinic learning were found in the Galilee.

these goods were creatively incorporated into local practices in distinctive ways in many provinces of the Roman Empire. Roman oil lamps, in order to be used and desired, were imbued with culturally relevant local meaning, incorporated into social relationships and changed, with transformative effects of cross-cultural consumption. The 'romanization' implies in the idea that a desire for Roman objects and Roman culture were natural in general, also an inevitable result of contact; but the pottery oil lamps were not passively emulated in a blanket fashion, rather they were consumed in a highly selective and creative manner (also ignored or rejected with equal selectivity).

The excavations of the kiln works of the Tenth Legion Fretensis on the outskirts of Jerusalem unearthed several types of earthenware vessels, tiles, and bricks, that were manufactured at the site. Apparently this workshop functioned for supplying ceramic needs to early Roman-period Jerusalem (Arubas and Goldfus 1995: 95-107)[59]. They probably produced the Roman oil lamps types RH1 and RH2 workshop. Italian imported lamps have also been found at Massada (Bailey 1994: 79-106)[60]. Adan-Bayewitz (1995: 180-181) cautions that the preference for excavating urban rather than rural sites is reflected in the fragmentary evidence for workshops. In the long term, he notes marked differences between the urban locations for lamp production and the manufacture of common wares in rural settlements in northern Roman-Byzantine Palestine. Thus, most of the lamp workshops in Palestine and its vicinity were located in cities[61].

The so-called Herodian wheel-made oil lamps' from the workshop Temple in Jerusalem, a national-religious centre for almost all Jews (Philo, Embassy to Gaius,10, 278-284; Philo, Flaccus, 9,45-46; Safrai 1965; Jeremais 1969; Levine 2002), stopped the ceramic production in about 135 CE – it is possible to precisely date this because the latest examples were found from well-dated evidence in contexts of the Second Jewish Revolt (Barag and Hershkovitz 1994: 45, n. 38; Loffreda 1996: 112). Adan-Bayewitz et al (2007: 2) also compared several hundred pottery vessels of the prevalent types of non-cooking ware, from Jerusalem and its vicinity, with 176 examples of the most common Herodian lamp type in this geographical area, from five northern sites: Sepphoris,

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[59] (Benny Arubas and Haim Goldfus, "The Kilnworks of the Tenth Legion Fretensis", The Roman and Byzantine Near East: Some Recent Archaeological Research, JRA Supplementary Series 14, John H. Humphrey, ed (Grand Rapids, MI: Univ. of Michigan Press, 1995), 95-107. BIBLIOGRAFIA - COLOCAR

[60] Donald M. Bailey, "Imported Lamps and Local Copies", in Masada IV: The Yigael Yadin Excavations 1963-1965 Final Reports, Joseph Aviram, Gideon Foerstern, and ehud Netzer, eds. (Jerusalem: Israel Exploration Society, Hebrew Univ. of Jerusalem, 1994), 79-106.

[61] Adan-Bayewitz, D. 1995, A lamp mould from Sepphoris and the location of workshops for lamp and common pottery manufacture in northern Palestine. The Roman and Byzantine Near East, 177-182. - BIBLIOGRAFIA - COLOCAR.

Dora (Dor) and Scythopolis (Beth Shean), Gamala and Iotapata (Yodefat). The report on the chemical compositions of 7 Herodian lamps (including three lamps from Jerusalem, three from Eboda (Avdat), and one from Meiron) presented chemical compositional matches with Perlman et al's Jerusalem reference group. The source of clay for this reference group is the modern village of Motza, west Jerusalem (Gunneweg and Perlman 1984-5; Perlman et al 1986; Yellin 1994; Yellin et al. 2001; Yellin and Cahill 2003).

The presence of Herodian lamps at northern sites (Gamala, Iotapata and Sepphroris) has been seen as characteristic of the presence of the Jewish population; consequently, these lamps have been used as a criterion for identifying sites inhabited by Jews in the first century CE onwards. The suggested evidence demonstrates that raw materials employed for more than a century were apparently no longer used in the decades following the destruction of Jerusalem and the concomitant upheaval in the vicinity of the city. The total of 176 Herodian lamps sampled by Adan-Bayewitz et al (2007) demonstrated that samples from Gamala, Iotapata and Sepphoris had an identical chemical composition to the waster, and flasks from Ha-Motza. On the other hand, pottery characteristics found in the Jerusalem area in Roman Palestine (late Second Temple period), and Herodian lamps from Dora and Scythopolis were made from types of soils that were available in the Galilee. This means that inhabitants from five northern sites were familiar with the Herodian lamps produced in the vicinity of Jerusalem, also that a local production of this lamps could be located somewhere in Galilee, reproducing the established pottery of the workshop Temple in Jerusalem (Adan-Bayewitz et al 2007).

Fig. 54. Geological Map of Jerusalem and its surroundings.

The comparison between Tel Anafa and Gamala may strengthen the case: from the 1186 lamps from the Roman period found in Tel Anafa just seven were of Herodian type; while of a total of 1566 examples found in Gamala, around 93% were Herodian lamps. Gamala probably has the biggest assemblage of Herodian lamps from Palestine. In contrast with the assemblage of Gamala, the population of Tel Anafa obtained virtually none of their lamps from the Jerusalem area. This essentially means that the inhabitants of Tel Anafa were not Jewish, and by consequence the population of Gamala were "more Jewish"; so they had a different supplier for light which could or could not have religious implications for their identity. Most probably, beyond the religious definition, the main difference between those two local populations was social status.

It is interesting to note that the idea of Jewish pilgrims bringing Herodian lamps from Jerusalem would suggest that these lamps might have afforded some ritualistic or socio-religious significance in northern sites, but also an economic and social status on the networks of trade and prestige, as a means of direct ties with the Second Temple workshop. After the destruction, war and

expulsion of the Jews from Jerusalem, Judaism was completely fragmented and efforts to§ keep it alive and reconstruct traditional roots fell on the most popular and attainable media of the period: on the clay lamps. The artefacts could also act as a heritage souvenir that helped to keep some ties with the lost city Temple. Jews - including those from many countries of Diaspora - were particularly present in Jerusalem during the three annual festival periods (e.g. Philo, Special Laws, 1, 67-69; Josephus, Antiquities 17, 213-214; War 6, 420-427). Although this presence would be less effective after 135 CE, an inked Hebrew graffito on a lamp fragment recovered at Masada, was stamped on the lower portion of its nozzle with the name "Joseph", suggesting the manufacturer was Jewish. A second case can be found on the "Yehohanan" inscription on the shoulder fragment of a Herodian lamp recovered at Masada, which suggests that the lamp owner was a Jew (Barag and Hershokovitz 1994: 66, no. 111 and 71, no. 125).

Apparently potters at the Galilean Jewish settlements of Kefar Hannanya and Shikhin produced a well accepted (maybe trustworthy with regard to ritual purity) pottery during the Roman Period after the mentioned date (Adan-Bayewitz 1993: 228-39). However, despite being the two main Galilean suppliers of common pottery in the first century CE with examples in assemblages at Scytohoplis, there is almost no spread of lamp production found in Palestine that matches with the composition raw materials of the Kefar Hannanya, Shikhin and Golan reference groups (Adan-Bayewitz 1993; 2003; Adan-Bayewitz et al. 1995).

Lapp (1997: 17-23; cf. 231-32) based on typological features, but also the petrological and chemical compositions of the samples of oil lamps from Palestine and Transjordan, found several distinct types of clay fabrics, thus suggesting several different clay sources (6 Petrographic Groups)[62]. A point has been made on the difficulty of investigating by thin-section analysis the source of pottery made from marl clay, and Lapp (1997: 135) has strongly suggested a production centre for Roman discus lamps (classified by the author as 'Palestinian round with decorated discus lamp class') at or near Scythopolis. Within this framework, trace-element data of a second source clay for this lamp class would be in Phoenicia. (Lapp 1997: iv).

Therefore, according to Lapp an original local production centre located near or in Scythopolis would indicate lamp trade with Abila, Gadara, Pella (Decapolis), Ashkelon and Caesarea Maritime to Hornet Hazon, Meirion and Sepphoris in Galilee. An unfired discus lamp fragment from Scythopilis - sample DSC Y- and the chemical characterization using DCP

[62] grupos are described in 7- Archaeological-Archaeometric Evidence

spectrometry would point to Scythopolis as the possible manufacturing centre for Palestinian discus lamps (included in Lapp's Petrographic group 1). Lapp's study examined forty-three lamp samples belonging to the discus class, bilanceolate, and bow-shaped nozzle classes. Chronologically the lamps cover from the 1st to 5th CE (discus - 1st to 3rd CE; shaped nozzles - 4th CE; and bilanceolate - late 4th - 5th CE). As was emphasized at the beginning of this research, there is plenty of work to be done on the typology of oil lamps; hence, despite new research we also need more typologies of Roman oil lamps.

Essentially Lapp's (1997:118) study provided an interregional survey of lamp pastes collected from multiple sites located in several geographic areas in Israel and Jordan: the Coastal Plain, Galilee, the northern Jordan Valley, and Transjordan. The twenty Roman discus lamps came from eight sites that were divided into diagnostic macroscopic characteristics, such as bichrome slipping, lampmaker's mark with the Greek initial *eta* depicted either alone or in combination with another initial or mar; bi-associative motifs (ibis-and-crab); Bacchus-and-chalice; lampmakers' mark (double axe, gamma, alpha, alpha); and erotic motives. The Roman-Byzantine period bilanceolate (TYPE SUSAN?) lamp class would suggest the possible continuous use of the same source or sources over a substantial period of time. The suggested area for the exploitation of the foraminiferous-rich clay source for the manufacture of these bilanceolate lamps was somewhere in central and northern Israel, supplying the cities of Sepphoris (Lower Galilee) and Scythopolis, Gadara, and Pella (Decapolis) (Lapp 1997: 178-179).

The manufacture of lamps required the talents of master artisans and stone cutters for making moulds on location. The cosmopolitan urban environment would most likely be the place to place such an enterprise. Because of the added expertise required to carve limestone moulds, as demonstrated by the sophisticated decorative themes of many specimens found in Roman Palestinian cities, the resources necessary for the production of such mould-made lamps would raise the question of whether the lampmakers made their own mould; or instead of that, a coroplast carved the moulds used for making clay lamps and then sold them to pottery workshops for their subsequent manufacture. The evidence for lamp workshops for Roman Palestine and Nabatean, comes from the cities of Caesarea, Scythopolis, Sepphoris, Gerasa, and Petra-Zurabbeh. (Lapp 1997: 182).

The evidence for lime kilns found in close association with lamps and common ware kilns at the hippodrome workshop at Gerasa, would indicate that lamp moulds could be produced on the site

of pottery manufacture. Also it is possible that each urban workshop might have had an “outlet" shop on the *cardo* when the workshop was not near the central market. In accordance with the rabbinic sources, Safrai (1992: 229) points out that shop was synonymous with the workshops, so the potter would brought merchandise to the market and sold it to a merchant or a shopkeeper.

As noted above, the Herodian oil lamps produced by Jews were replaced to some extent by a mould-made version (after the First Jewish War), commonly termed “southern lamps” given their discovery in the hiding complexes and refuge caves in Judah pertaining to the Second Jewish War/ Bar Kochba War. Some of these lamps display symbols that are commonly affiliated to Jewish beliefs, namely “the Seven Species”(Deuteronomy 8.8), or national symbols such as the Menorah (seven-branched lamp stand), the Lulav (ceremonial palm frond) or the Etrug (citron). In addition to the technological differences of tproduction, the mould-made versions do not exhibit the rounded holed disk around the wick-hole that characterized the previous wheel-made versions.

The Samaritan lamps constitute a separate group of lamps whose ethnic affiliation is undisputed given their circulation at sites with a Samaritan presence and the fact that some of the lamps bear inscriptions with Samaritan script and Samaritan symbols, such as the Menorah, and iconographical manifestations of biblical scenery liturgy (Sussman 1983: 339-371). Their use however is not necessarily confined only to Samaritans, even though one would expect their use to be predominantly by Samaritan communities. Chronologically Samaritan lamps appear at the same time or just after the disappearance of the ‘classical' Roman discus lamps, so called Syria-Palestinian. These lamps were produced with a sealed wick-hole (the so-called “mirror”) that was pushed down by the first user as if to guarantee the lamp’s purity. Although their morphology and design bear resemblance to contemporaneous lamps produced in regional workshops such as the ‘Beit Nattif lamps’ (Baramki 1936: 1-10) and earlier forerunners such as the ‘Jerash lamps’ (Iliffe 1945: 1-19), the idea of breaking the mirror of the lamps by their first buyers recalls the intentional breaking of the Roman discus lamps. The remains of the breakage of the mirror of the Samaritan lamps which frequently appear on the complete versions show a striking similarity to the first type of intentional breaking we discerned above, and termed a direct percussive break (Tal and Teixeira Bastos 2015: 345-368).

In Samaria, Flavia Neapolis, or Roman Shechem, was built on the northern slope of Mt. Gerizim, over an earlier Hellenistic-Roma settlement, Ma’abarta. From its foundations, Shechem was the natural capital of Samaria and one of the most important cities in the Land of Israel.

Shechem was also the centre of the Samaritan people, above the city looms Mt. Gerizim, considered holy by the Samaritans, with is sacred precinct. (Yitzhak 2009).

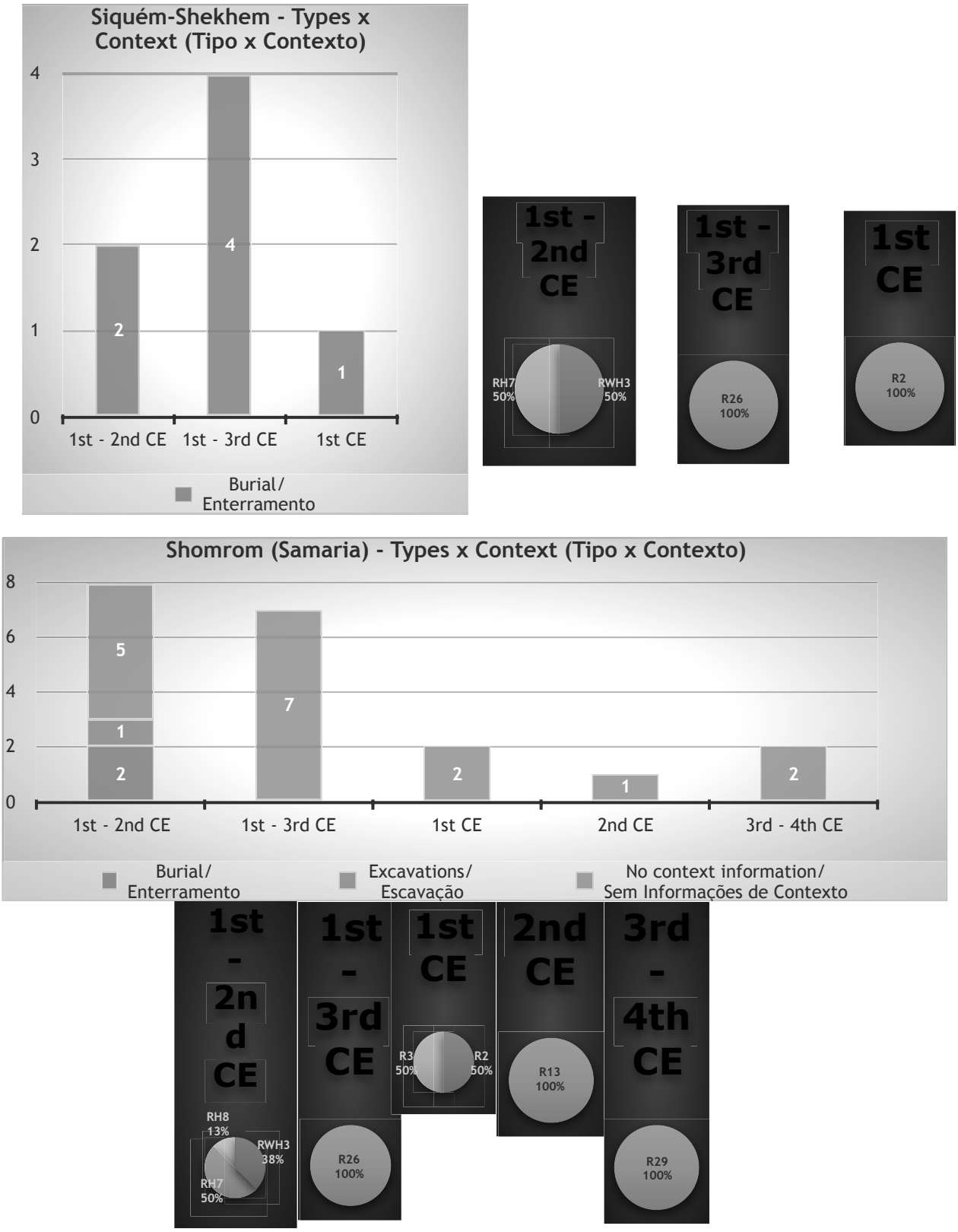


Fig. 55. Oil lamps types and context from Shechem and Shomrom, Samaria.

Iserlis (2015: 223-228) sampled 30 lamps and one incense bowl from Samaritan settlements on the Central Coastal Plain. Three main petrographic groups were defined: Fabric A is a product of marly alluvial-colluvial sediments and artificially added coastal sand, identified as alluvial-colluvial soil of the eastern Coastal Plain and the lower part of the Judean foothills; Fabric B is petrographically similar to Fabric A, the difference between these two groups is an absence of rounded to sub-angular quartz and feldspar grains up to 530 μm in the temper assemblage of Group B. Thus suggesting that quartz grains were an integral part of the clay and a product of alluvial-colluvial soil; Fabric C is ferruginous and the petrographic group is identified as Quaternary ḥamra soil mixed with coastal sand.

Fig. 56. Sharon Plain, Apollonia.

Fig. 56.1. Apollonia *villa maritima* or *mansus*.

Fig. 56.2. Apollonia to Tel Aviv.

Provenance was ascribed to Fabrics A, B and C as the environment of Apollonia-Arsuf, Tell Qasile, Khirbet al-Ḥadra and Tel Barukh Ravikovitch and its immediate surroundings (Iserlis 2015: 223-224; Ravikovitch 1969; 1981; Sneh, Bartov and Rosensaft 1998; Singer 2007). The non-plastic assemblage is identified as sand from the Central Coastal Plain, probably collected some distance from the outcrop of the marl or mixed with alluvial sediment by potters. The area east of the Central Coastal Plain and west of the Shephelah is covered by Quaternary alluvium, colluvium and soil, including strong calcareous components washed from Sephelah. Outcrops of Eocen, Turon and Upper Cenoman limestone, chalk and marl are located at a distance of 12-15 kilometres from the sites mentioned (Sneh, Bartov and Rosensaft 1998). The Hamra soil occurs along the Coastal Plain between Ashdod and the Carmel, with a 50% calcareous component from Carmel and mainly quartz between Ashdod and Caesarea (Dan et al. 1976; Goren, Finkelstein and Na'aman 2004: 292–293; Singer 2007; Nir 1989: 12).

Not only illustrative of the religious and cultural life of Roman Sepphoris, but also and indication that this was a city in which Jews and Pagans co-existed, impressive monuments, such as the recent discovery of a Roman temple, broaden the scope of the discussion by making it clear that Sepphoris was the Jewish capital of the Galilee in the Roman period. However, a significant pagan population with economic, political and social means, built a large and impressive temple in the heart of the civic centre. Enclosed within a walled courtyard, the central location of the temple and its architectural relationship to the surrounding public buildings and private dwellings contribute to our understanding of urban Sepphoris in the Roma era (Weiss 2010: 215-216).

Similar to the Herodian temple at Caesarea Maritima, that was abandoned in the 4th century CE and replaced long after the city embraced Christianity, and the Byzantine church with the round plan on the acropolis in Scythopolis, which was built near, and partially covering, the Hellenistic-Roman temple of Zeus Akraios, the construction of the Roman temple in Sepphoris during 2nd century CE flourished in a vibrant communal, economic, and religiously activite city (Talmudic literature, Roman temple and Christianity). In contrast to the events in Jerusalem or Gaza, where churches were constructed immediately after the temples were desecrated and destroyed in order to accommodate the construction of buildings befitting the new religion, the Roman temple in Sepphoris was abandoned sometime in the 4th c; it is not clear whether local urban circumstances led to the cessation of the pagan cult. The building of the church on the foundations of the temple itself may attest to the preservation of the city's sacred precinct over time. Therefore, the conversion

of the empire to Christianity contributed to the desertion of the old cult places. In the 4th and 5th c. the area was used for other purposes and during late 5th or early 6th CE a church was constructed in the vicinity of the abandoned temple.

Fig. 57. Shekhem, Samaria, Israel.

The somewhat limited morphological varieties of Christian lamps, as reference to late fourth to seventh century CE lamps with defined Christian symbols, namely crosses and inscriptions (Loffreda 1989), are in a sense evidencing the process we saw in their earlier and contemporaneous counterparts. An ethnic or religious group distinguishes the identity of its members by means of symbols that define it. While lamps in Byzantine Palestine were used in a monotheistic environment, Christian symbols on lamps became by the sixth and seventh centuries CE definitive of the country's largest population group. Although Samaritan lamps continued to be produced in this period, they normally lack an explicit Samaritan symbol, and their definition as Samaritan is basically morphological. There are no lamps we can define as Jewish during this period. It seems that the largest monotheistic groups of the Roman period, the Jews and the Samaritans, which probably expedited the intentional breaking of Roman discus lamps, in order to promulgate the

desired victory of the Lord over His pagan counterparts, adopted other means of ethnic definition by the period when Christianity became the dominant religion in the region.

Fig. 58. Augusteum in Samaria.

According to Harral (2005: 269-73), the border between the provinces of Syria Palaestina and Phoenicia would to have served as a barrier to the distribution of common household pottery in the Golan, from the second century CE. However, that doesn't seem to be the case for the Roman discus lamps, massively produced in the region of Tyre according to the petrographic analysis. At Tyre, for example, eighty-eight complete lamps and an astounding total of 1701 lamp fragments were found in the Apollo complex (fig. 136). Except for three Hellenistic and four Byzantine lamps, the remaining lamps date from the first and second centuries CE. According to Marchand, the lamps could possibly extend into the third century CE. Marchand separates the lamp types into seven groups. (Sem referência, ver como usar). (Lapp 1997: ???).

Apparently the Tyrian or Phoenician lamps serve as the catalytic link that eventually drew Tyre into the regional and colonial economy. The increasing entanglement with the Mediterranean states eventually resulted in alterations of native patterns of production in North Africa with the

spread of Christianity and Jewish Diaspora, exchange, and social relations which led to increasingly asymmetrical economic and political relations with the colonial powers that brought about further subtle but significant changes in both native and colonial cultures. Thus, these centres of production of oil lamps were acting as nodal contexts that articulated regional exchange systems. They served to provide links to the gods that could be used to define the structure of relations between social groups or categories within the region and communities of Palestine. This would provide an essential mechanism for the process of mobilization that underlies the political economy and labour market.

Commercial activities took place between Roman Palestine and North Africa. Only a few provincial Palestinian lamps (e.g. the Judean moulded, the bilanceolate, bow-shaped nozzle, Caesarean, and Samaritan) have been found at sites outside of Roman Palestine. Some examples were recovered from deposits at the Athenian Agora, on Delos, Isthmia, and (REF NO MAR NEGRO). The limited presence of Palestinian lamps in the other provinces sharply contrasts to the presence of lamps of foreign manufacture, particularly North African ones manufactured in Roman Tunisia, found at several Roman Palestinian cities, such as Gaza, Ashkelon, Caesarea, Dor, and Scythopolis. (Safrai 1994: 82-99, 326-337).

Investigating the issue of cultural boundaries and transformations of identity in Palestine and North Africa during Roman period and their respective colonial encounters is obviously a complex endeavour. Recent excavations of a building at Carthage discovered numerous lamps with images of menorahs inside the structure and was indicative of a possible synagogue by the excavators (Lund 1995: 245-262)[63]. Do lamps from Jewish catacombs or synagogues in Syria-Palestine consistently bear images of menorahs and/or Torah shrines.

Archaeologists recognized consumption as the social process by which people construct the symbolically laden material worlds they inhabit and which, reciprocally, act back upon them in complex ways (Dietler 2010). Consumption is what ultimately determines where most of the objects excavated are located and in what state they are found. The patterns of production or exchange emerging from these kind of studies are arenas of agentive social action, symbolic discourse, and cultural transformation, where the material domain operates within. The simple archaeological treatment of the process of consumption has sometimes being accepted as a

[63] John Lund, "A Synagogue at Carthage? Menorah-Lamps from the Danish Excavations", JRA 8 (1995), 245-262.

transparent epiphenomenon rather than a domain of agentive social action. The primary analytical significance of archeology is that it produces a system of signs within culture and identity.

The origins, roles, and meaning of consumer preferences for oil lamps shed light on the emergence of patterns that explain the role of particular artefacts and their context in the Roman world. All the economic activity related to these artefacts took place by means of political, military, and manly religious driving forces, with the ritualization of light. It appears that exchange mechanisms formed a complicated and interlocking pattern inside of Palestine through land-routes, and sea-routes which motivated attitudes towards goods, both rejecting Roman iconography on the Roman discus lamps, and later on receiving influences from the North African lamps from Roman Tunisia. Oil lamps together with tablewares were transported as secondary cargoes, along with main cargoes such as amphorae, marble, agricultural products, and other perishable products, such as papyri, textiles, wood, and so on, across the Roman Mediterranean. During Late Antiquity three tablewares had major production and distribution mechanisms, the so-called Cypriot, Phocaean and African Red Slip Wares. Especially in the Eastern Mediterranean African Red Slip Ware - ARS - was shipped to Palestine and elsewhere, including Rome, in great quantities and with a wide diffusion. (Bes and Poblome 2007: 1).

Clay lamps were thus no longer simply an economic product of an ends/means calculation or a passive reflection of other structures, instead they also provided a way of addressing the issue of agency in colonial situations by revealing patterns of choice and their consequences. (Dietler 2010: 214). The consumption of Roman lamps, was a process of structured improvization that continually materializes cultural order by also dealing with alien objects and practices through either transformative appropriation and assimilation or rejection. Often it is the contradictory actions of individual human beings and social groups located differentially within complex relational fields of power and interest that untangle a process of selective appropriation and creative assimilation according to local logics. It is also a way of continually constructing and reconstructing culture in a period of fragmentation and changes under Roman colonial domain.

Finally, oil lamps in this framework of consumption have been used by both parties (locally and abroad) in exchanges to attempt to control one another, making subjects by means of objects, and creating novel desires for new goods (Comaroff and Comaroff 1997: 218). A tension was created through attempts to get people to use imported objects in particular ways and the belief that

the use of particular objects or technologies would inherently induce certain kinds of desired behaviour.

9.1. Distinctive places of devotion in Palestine

The Roman period of domination in Palestine begins with the conquest of Pompey in 63 BCE, in a Westernization process of the East, previously carried out by the Greek and Hellenistic culture. Chronologically, the domination period extends until 325 CE, when the region suffered The region be studied using both written records as well as the archaeological record. Archaeology is always able to better understand the continuities, the collective and long-term trends, rather than just singular events or individuals (Funari 2006: 218).

In this sense, the study of the way in which the understanding of traditions emerged and formed, the way in which social groups organized themselves in spatial terms; and the production and use of materiality, are key aspects in the knowledge of human societies beyond their textual production. Speeches are built (as well as traditions) within the interaction and interconnected network groups from where communication and trade develop their fields of action. Textual constructions are the result of oral and textual traditions, written according to the overlapping of power of certain hegemonic traditions in a given period and context. Consequently, they are part of power's geometries in the landascape; once the territory is imbued with the discourse of truth, the promotion of social memories and the production of contexts and writings can occur. In turn, these serve as a foundation for memories, thing which are always in training, individually and collectively. Hence, certain parts of the past are privileged over others, and new construction of the discursive form, in a ceaseless process of "coming-to-be" occur in space, through the simultaneity of stories, which until now are given context and produce texts and material culture. The discursive multiplicity in the process of "coming-to-be " is the governing principle of the formation of spaces (MASSEY, 2009, p.132).

Archaeology is the study of the ruins, the material remains, the waste, the disposal and final destruction. Archeology deals with social memories, or the finding of places and materiality of archaeological sites that have been abandoned or forgotten and covered with sediments creating stratigraphic layers,.Contexts are therefore the primary and fundamental basis of archaeological (Jones 2007; Van Dryke and Alcock 2003).

Religion is a basic element of human organization in relation to their landscape, and often archaeological contexts are related to some sort of religious practice. The idea of religion is one of the first we receive within this life, and social organization comes with it during the formation of our lifes. The same happens with spatial organization (if not the entire organization of space, in most cases) (Lefebvre 1974; DeCerteau 1984). Thus, to some extent our sense of space is always pre-designed and materialized. As a concept of organization that exists separately from space, time and physical reality, religious cosmology remained, until the mid-sixteenth century, within the monopoly of the explanation of creation and evolution of the universe, centred mainly in the exclusive domain of theology (Krauss 2012). In this sense, much more than religious places (sanctuaries, temples, sacred sites, synagogues, churches etc.) or funerary aspects, the study of religion through archaeology (or Archeology of religion, see Insoll 2004) seeks to articulate the degree to which religion influenced the material culture and the organization of human groups in a given context, much more than understanding the origins of the universe or the guidelines that flow from it. Therefore, it is necessary to examine broader contextual associations, addressing religion in archeology as a possible underlying component to any use and meaning of material culture (especially in Roma Palestine), not only as a term applied to specific objects.

We must recognize the potentially incorporated nature of religion as a fundamental building block, if not sometimes the essential foundation of an individual identity or group in the past and present. As outlined, this approach allows us to analyze religion as part of a comprehensive package possibly structuring all aspects of life, including material culture (Insoll 2004: 155-156). Essentially religion is recognized largely in its metaphysical elements of definition. Religion that challenges rationality essentially happens in the mind (Taylor 2004). Thus, despite the progress achieved through the processualism vies of research (Renfrew and Scarre 1988) with regards to the debate on the knowledge of the cognitive process, when it comes to the manipulation of materiality and landscape by human groups, it is necessary to give priority to multidisciplinary approaches nowadays.

Approaches that include more subjects access more analytical forms and better interpretations of contexts and materiality. With regard to cognitive and meaning processes the archaeological record can be addresses using various theoretical perspectives (including structuralism, cognitive semiotics, economic theory, Marxism, critical theory, among others). These perspectives help to foster interpretive possibilities and explanations of social difference and the problem of representations. Essentially this recognition serves to assert that religion does not necessarily imply an isolated category of practice or action. It is located in the cultural representations, the array of different discourses and practices that aim at the construction of the social world and the contradictory definition of identities. The representation as experience, brings the ability to produce meanings, and the adequacy of that is to be expressed and inserted in a cultural context (Geertz, 1989: 105).

Religion can also be understood as a system that is established through public and private acts, collective and individual, which according to tradition (or traditions) establishes the rules and ordered actions (rituals) which express the beliefs of a particular group and its symbolisms (Durrans, 2000: 59). Thus, religion promotes subsidies for identity and cohesion of human groups in the same instance that it presents a set of rules and practices by which a particular group is recognized, conceived, differentiated and defined (Byrne 1988: 7). It covers, therefore, a language system and practices that organize the world in terms of what is considered "sacred" while providing explanations of human life from somewhere outside itself. Religion has a formative impact on common sense, which shapes our apprehension of the everyday world and what is in it (Hinnells, 1995: 437;. Geertz 1968: 95-98.).

There is a broad consensus that public services in *Orbis Romanorum* were at the centre of the practice of Roman religion. The concentration of public services in the cities shows that Roman religion in the provinces held similar characteristics to that practiced in the metropolis. However, the priesthood of the provincial pontiffs did not seem to be organized in the form of court, at least not in the way their peers did it in the metropolis. The Roman priesthood in provincial communities appears to have been more involved with the ritual performance than in Rome itself (Woolf 2009: 244). In this sense, the Roman imperial cult has been understood as a set of rituals designed to integrate the emperor at the local pantheon in order to grant favours and provincial loyalty. It is indicative that the increased power of ritualization in the Roman Empire was a consequence of the slow shift that occurred in the understanding of the ideal of *Civilis Princes*; in other words, between

the traditional ideal of equality of all Roman citizens and the new imperial quality of distance and elevation, which led to the understanding of the emperor as a protector of the traditions, and divine arbiter, of the religion and *romanum rituale* (Silva 2003). In this sense, the emperor is the one who can intervene and control the *sacer* (sacred), which refers to what was "dedicated to a deity" in the Roman habitus (Bourdieu 1996). This embraces both the understanding of places and objects, such as that people provide the primary functions of religion (and their rituals) precisely because they provide mechanisms to define where secular life ends and religious life begins.

In Rome, the elite continually controlled religious behaviour. The Roman elite defined what should be considered appropriate religious activity in the Imperial areas. Rome was never free for the exercise of all religions. The Roman elite, especially in the provinces, defined what was unsuitable for traditional Roman religion as a way to define their position within the State. Legal initiatives under the aegis of the defense of the Roman religious system were taken against real or imagined enemies, whenever they were within reach of the elite. Although they tolerated religious innovation amongst the subjugated peoples, foreign cults were often associated with mysteries and certain performances, associations and/or joint activities, which were not accepted, and were treated as religious crimes. The penalties for transgressions often involved public punishments. Religion was one of the major aspects of change with Rome and its Empire, which was configured as a federation of elites centred in the Mediterranean and its control interflow (Rizakis and Camia 2008).

Political identity was defined by access to religious rites, which coexisted with political rights within the Roman world. The individual only existed in the public dimension, to the extent that their subjectivity and inserted context allowed access to groups and their rites. In this sense, the equestrian order was much more amorphous and constantly more open to new members, not only in Italy but also in the provinces. During the reign of Augustus, the term 'religious' served to designate those who practised the ritual according to the usual status (*ritus romanum*) and did not engage in *superstitio*. Categories of Religion and *superstitio* were not categorized as true or false, and are incorporated and used during the Christianization of the Empire campaign, institutionalized from the fourth century CE. The term *superstitio* was initially used to categorize inappropriate behaviour of individuals (not groups) in relation to the internal irregularities of the Roman rite. The term also referred to the meaning of powers and dangerous practices that the rite that could bring, such as some sort of threat to the stability of religion or of the Roman state (Beard et al 1996: 213-215).

Roman ritual traditions were one of the ways in which different people could be differentiated and characterized, as illustrated by the ritus compendium Graecus (Scheid 1995: 15-31).

From the Principality period, a number of direct measures were taken to control religious activities and associations of those outside the elite. Cesar Augusto banned private companies (collegia) fearing their social and political role of disorder. However, Cesar specifically allowed the meeting between Jews and their collection of money. The organization of festivals, processions, purifications, sacrifices and communal meals, would ordinarily be controlled by the ruling elite in accordance with the calendar that evoked the Roma. Saturnalia and Parentalia were cases where the celebrations take place in the household within the scope of domestic rites. However, public Roman rituals were more austere, and there were no sacred books, complex sentences or ceremonies whose meaning could be debated endlessly by scholars. In general, the sacrifice was more central to provincial Roman communities than it was in the metropolis (Elsner 1991: 50;. Woolf 2009 :250.). The gods who were honoured with dedications by senators and equestrian officials who served in the provinces also reflect the traditional emphasis for the official of the gods of Rome, especially Jupiter. By the fourth century CE, senators and equestrian officials were rarely initiated into foreign services. Augusto strictly recommended that his son Gaius should not offer prayers to HaShem in Jerusalem. In fact, during the first century CE, the growth of "foreign superstitio" in Rome came to represent a threat to the official political-religious system.

One thing is certain, the Archaeology of Roman Palestine can only provide a comparative basis with the texts written from the Edomite-Jewish-Roman period Herod I, client king of Rome in Israel, between the years 37 BCE to 4 BCE. There is no evidence of a Parthian invasion in 40 BCE and open conflict for a territory of conquest by Herod, as suggested by the written texts, especially Josephus. However, the buildings and material culture of the Herodian period represent a dramatic change in the region, with a building programme that affected not only Jerusalem, but Judea, Samaria and the central portions of the domains of Herod (Chancey and Porter 2001).

Roman sacrifices represented the stabilization of the relationship between worshipers and divinities. The iconographic evidence abundantly indicates the existence of the Roman ritual, especially sacrifice in the provinces, as can be seen on the Lucerne disc example found in the excavations of a mosaic floor in Beth She'an (Fig. 1 - Sussman 2012: 189). The small lamps are used as 'memes', in that the images of the pieces carry pre-designed and well-known meanings in the discourse practice. Besides the fact that with only one mould was imported from Italy, local

workshops had the ability to maintain and / or change the iconographic themes and produce a lot of pieces using the same mould in the manufacture of objects. The meme as an information unit that multiplies demonstrates how acquired behaviour, symbols and rituals propagated through imitation survive beyond individuals and groups. Inherent in replication is the possibility of mutation and the fecundity of ideas that allow the transmission of memes in a new form, keeping the attractive meaning and communicative self-identification.

Fig. 59. Clay lamps with sacrifice scene found associated with a mosaic floor in Bet She'an: Two mans standing holding an animal on a circular altar for sacrifice

(Sussman 2012: 189; 335: fig.2)

When the sacrifice scenes are visible they appear to be in accordance with the standards of the Romans, as established from metropolitan evidence (Woolf 2009: 244). Traditions and Roman sacrificial rites expanded in a world where the same kind of offer was established with different rites, meaning and purpose between the groups in the region. , In the Roman world, appropriations and exchange, as well as taxes and compliances caused religious changes in the course of a ritual system at the expense of its competitors. And so, under the aegis of terminology and Roman images, different rite systems were extended and / or emerged.

From the second century CE no one could be a member of a guild and social associations were banned, but funereal associations could come together under the auspices of a god. The poor

were allowed the organization and monthly collections for the burial of the involved. The soldiers could only join if it were merit of religion and worship of Jupiter (Doliqueno or Capitoline) and Mitra. Christians did not have permission to have public meetings and to a great extent were treated as Jews, proliferating in the initial period through their networks of power, trade and cultural contacts. Roman civic religion, however, could accommodate a variety of rites and meanings according to certain disciplines.

Archaeological has the potential to help us with the analysis of the strategies of manipulation of identities in relation to materiality, politics and the economy (Jones, 2007: 110). We must assume that Roman priests were in Palestine, and pontiffs are attested in provincial communities, judging by local laws. Only some of the functions of the Roman priests of the republican period were incorporated and carried out by their provincial analogs. Most of their functions were delegated and assigned to judges. However, the arbitration rituals remained a fundamental role for Roman priests everywhere.

Substitutions and syncretism occurred in different areas of the Roman power system, enabling the interpretation of the metropolitan and traditionalists observers as a depletion or pollution of Roman religion. Members of the priesthood in the Palestine Province did not find coherence in discussions on the interpretation of the Jewish Torah or the Samaritan Torah, since there were active in these contexts, demanding observance of rituals, the field of themes and languages (the Jewish Torah (תּוֹרָה) was written in Hebrew and the Torah Samaritan woman at the Samaritan alphabet) and the fragmented nature of the Abrahamic religions after the period of 70 EC. A number of new technologies, art forms, funerary practices, ritual practices, alliances, strategies and types of use of space took shape after the suppression of *Primum Iudæorum Romani Bellum*, or the Great Jewish Revolt (המרד הגדול), which began in 66 CE and was controlled in 70 CE. The Jewish insurrection was completely suppressed only after the revolt of Bar Kokhba (מרד בר כוכבא) during the Hadrian period, between the years 132-136 CE (traditionally the Tisha B'Av marks the date 135 CE). There are indications that great care had been taken to accommodate existing services and develop appropriate and authorized syncretism between local deities and Roman. The Temple Mount, the blood sacrifice and the priests who officiated in Jerusalem were central to Jewish identity, though the Judaism of the Diaspora with the proliferation and spread of synagogues and new rituals, the growth of the rabbinate in Galilee and the development of the Torah oral (Talmud, תַּלְמוּד) and its exegesis, which provided subsidies for education (Torah) and cohesion with the

tradition of the Jews. On the other hand, not all Jewish communities were similar and consistent with each other or followed the same rites (Woolf 2009).

Rituals are the mechanisms by which religion takes place as the centre of daily life, affecting people's attention and developing relations with materiality. The statues of emperors, for example, were treated religiously, and places where they were located considered as a refuge, thus, citizens could appeal and obtain protection for the crimes committed there. The same custom was already widespread in Greece, and the Roman authorities feared the abuse of this privilege.

Recent archaeological research on Roman Palestine has brought more information on urban contexts and cities. Prominent among the main urban environments, cosmopolitan cities and the interior were: Caesarea Maritima, Aelia Capitolina (Jerusalem Colonia Aelia Capitolina), Scythopolis (Beth She'an or Scythopolis), Sepphoris (Tzippori, Eirenopolis or Diocesaraea), Caesarea Philippi (Paneas or Banias), Sebaste (Shomron or Samaria), Neapolis (Nablus or Flavia Neapolis), Tiberias sites of Capernaum, Masada, Qumran, Jodefat, Gamla that reinforced the Jewish presence through the presence of vessels and ritual baths (mikveh or mikvah, or מִקְוֶה מקווה). The urban fabric of Jerusalem still preserved much from the Adriano period. The Byzantine mosaic (sixth century CE) of the church located in the town of Madaba, Jordan, reinforces the idea of that urban fabric. The Cardo Maximus comes out of the north door, at the Damascus gate, crossing the city to the south and the other runs parallel next to the city wall. In excavations at the gate of Damascus found a triumphal arch with characteristics similar to the well-preserved arches of Jerash, Jordan, of the second and third centuries CE. This reconstruction of the city is chronologically dated by the excavations between the end of the third century CE (with the presence of the X legion) and the beginning of the fourth century CE, the time of the Palestinian Christianization process in which the conquest of their spiritual capital is consolidated (Geva and Avigad, 1993).

The cardo was reached toward Mount Zion, where the camp X legion was stationed. The Decumanus Maximus probably followed the line of the modern street David and Chain Street, and ran toward the valley Tyropoeon along the Herodian western wall toward the Temple Mount (הר הבית). Areas of the Cardo Maximus of Jerusalem were excavated and parts of floors and columns were unearthed (Chancey and Porter 2001: 189-190;. Segni and Weskler-Bdolah 2012, Figure 3)

Fig. 60. *Cardo Maximum* of Jerusalem (Segni e Weskler-Bdolah 2012: 23-24).

The city had two forums, one in Muristan (currently the Christian quarter of the Old City), and the other further north, in the place where Hadrian erected a temple dedicated to Venus (later in the same place the Church of the Holy Sepulchre was built). From another forum located north of the Temple Mount, only the bow of Ecce Homo is left, an arc mistakenly associated with Pilate's figure. The reconstruction by Adriano reused materials from the Herodian period. There is some regularity in the northern plan of the Roman city which was extended to the legionary camp installed on Mount Zion. The exact location of this legionary camp is not clear; however, it has been suggested that it was located in the areas of the Jewish and Armenian quarters of the Old City. Camp evidence mainly consists of inscriptions and tiles with the pattern of the X Legion Fretensis. The new city built on top of Jerusalem was exclusively associated with the traditional Roman religion, at least in this initial period after reconstruction. Cassius Dio (Roman History 69.12.1) announces the dedication of the Capitoline temple of Jupiter on the site of the Temple of the Jews. The coins minted by the city appear with the typical gods such as Hygieia and Dionysian (Meshorer 1985). Jews were banned for a while from entering the city, and transgressions of the law were punished with death. The implementation of the ban does not seem to have lasted long, but the Jewish character of the city was devastated and fragmented under Roman occupation.

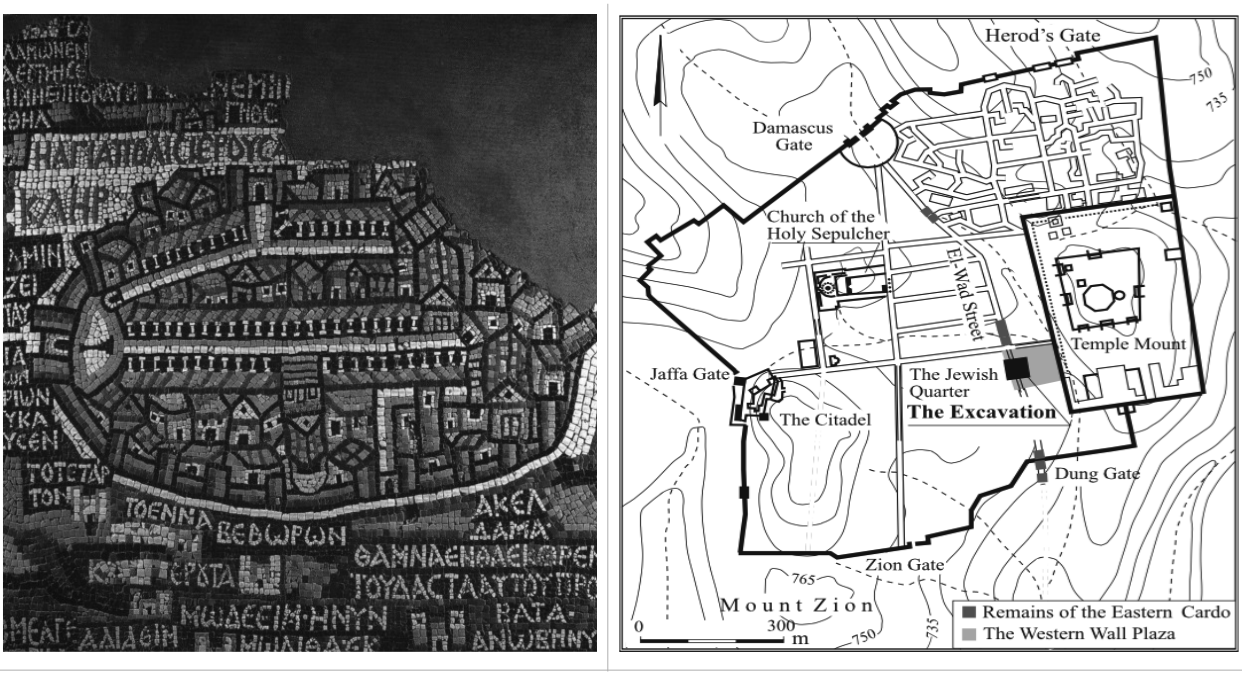


Fig.61. Mosaic of Madaba, Jordan and maps of Jerusalem.

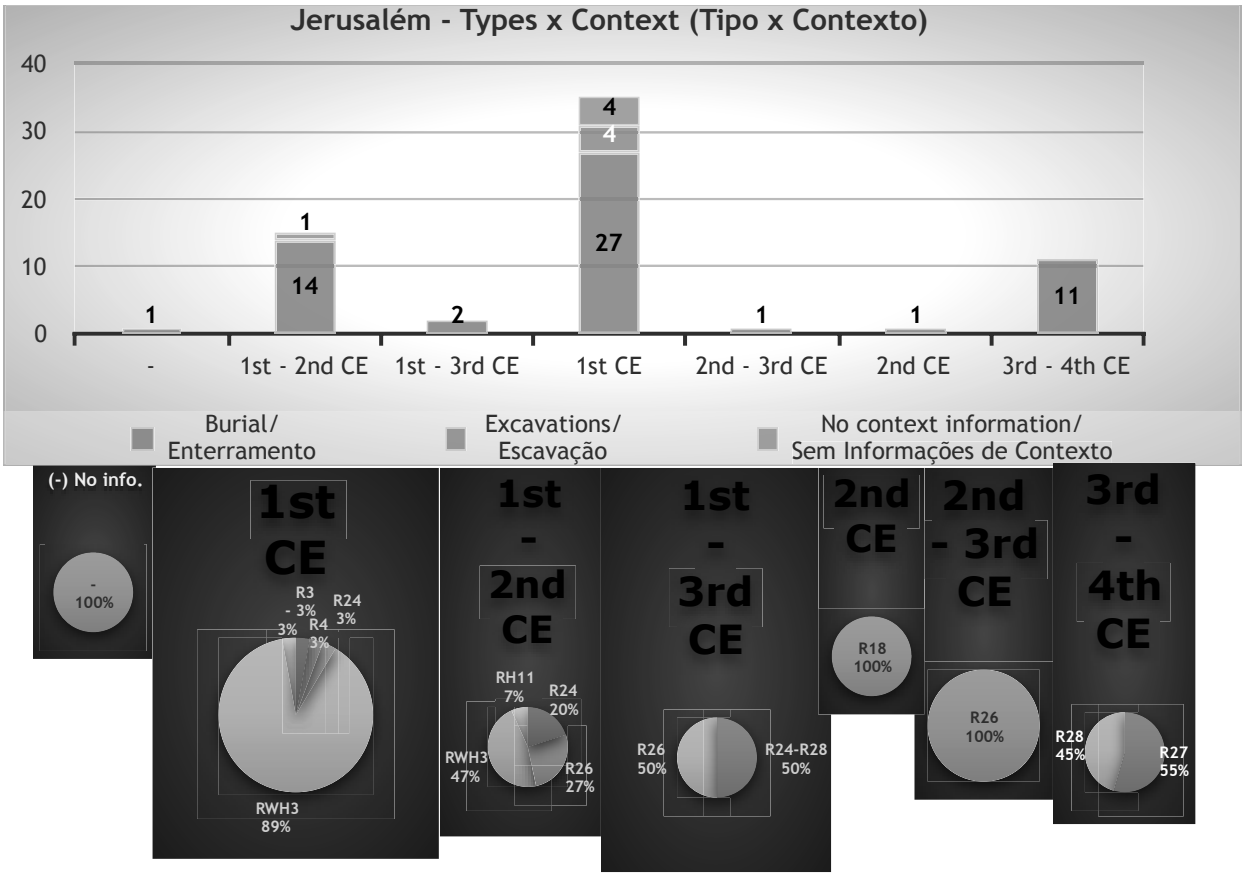


Fig. 62. Oil lamps types and context from Jerusalem.

The archaeological record also witness the Roman military presence elsewhere in Palestine. At Judea and Galilee inscriptions have been found relating to the Roman military units. Evidence of the units of the VI Legion Ferrata comprise a military fortress located in the vicinity of Tiberias, and other military evidence is a fortification on Mount Hazel and a camp in Tel Shalem, where an inscription mentioning the legion and a bronze statue of Adriano were found (ISAAC, 1992; Safrai, 1992).

9.2. Places of devotion and Roman clay lamps

The Roman road system provided reliable routes to facilitate the movement of troops and all Roman business. Paved roads crossed Palestine and the system of Roman roads went from Syria to the Dead Sea through the Via Nova Trajana. The Via Maris, which linked Antioch and Alexandria, also fulfilled an important connecting role between cities and was linked with Israel's coast through a road leading to Caesarea Maritima, also connecting the city of Legio and Beth Shean (Scythopolis); which in turn is connected to the Via Nova Trajana. Caesarea Maritima functioned as the main center of Roman power. In the second century CE the theatre was rebuilt and the circus was built. An inscription reflects the presence of a shrine in honour of Adriano, and others attest additional construction projects (Lehamann and Holum 2000). Statues of Roman deities were found in the excavations of the city (Gersht 1996) and the Jewish community built a synagogue during the third century CE. Roman roads tend to have landmarks that help us to understand the construction and renovation of these routes and connectivity in the region. There were further roads in the north-south which linked Gaza and Joppa to Jerusalem, Neapolis, Sebaste, Legio, and east-west routes conectavam Tiberias, Philip and Tyre Caesarea (Avi-Yonah, 1966, Isaac and Roll 1982; Fischer, Isaac and Roll 1996). Through Caesarea Maritima flowed grain, wine, oil, ceramics and other products through a well-established urban apparatus which made the city an important commercial and religious centre. The dock at the port of Sebastos (Greek name of Augustus) in Caesarea Maritima the platform of Augustus and Roma Temple stands out in the landscape. The city was of orthogonal layout with facades, mosaics, columns, marble facings, aqueduct, warehouses and trade. The Temple of Augustus and Rome, the theatre and the amphitheatre, all this urban apparatus was connected to the city and the name of Caesar and Augustus. The port of Caesarea was an attractive commercial spot and the area was used for warehouses during the early Roman period and

underwent a process of change that can be evidenced by ceramics and small lamps. A complex of three warehouses, one of them, Warehouse 1 was excavated between 1973 and 1974. The warehouse was 30 1 m long (east-west), 5 m wide and measures 5 meters high (Figure 4). Excavations of this area indicated that there were only a few stores in this part of town, which were 10 m from the largest street of the harbour. This street collapsed, so it is impossible to determine its foundations.

Fig.63. *Cardo Maximus* of Cesareia

Fig.64. Cesareia Marítima.

The excavation of Warehouse 1 of Caesarea Maritima unearthed 34 intact small lamps and some fragmented, the small lamps were distributed on the warehouse floor 1 which has been identified as a Mithraeum. The small lamps were dated between the second and third centuries CE. Interestingly, they appear intentionally broken, suggesting a breaking ritual before the lighting of the lamps (Blakely 1987: 96-97). One can accept the participation of Jews, Samaritans and Christians in the worship of Mithra in Caesarea and the symbolic exchange between the groups in this rite and its location, as I shall demonstrate further in this book. The act of intentional breaking of clay lamps was familiar among the monotheistic groups from the Roman period in Palestine. During the Byzantine period, the institutionalization of this practice led to the Samaritan rite of breaking oil-lamps; in other words, the practice of producing completely closed oil-lamps for the group's own consumption, forcing the user to break the top of the object (which contained no iconographic motif) at the time of lighting the oil lamp (Teixeira Bastos 2013: 35-48). A Heliogábalo bronze coin dating from 218-222 CE was found on the Mithraeum floor (Blakely 1987: 100). Most broken lamps are from the end of the first and second centuries CE, while the copies that were found closer to the altar date from the late first to the middle of the third century CE. This suggests that the oil lamps were being used near the altar for some kind of ritual activity.

The city Mithraeum was put on the site of an horreum, in a busy area of the city. The practice of Mithraism in a commercial and visible place emphasizes the importance and nature of religious movements in the Roman Palestine. Competition and rivalry among religious groups was a common mark of the city (Donaldson 2000). The *horreum* building received a symbolic appropriation, similar to a cave of a moderate size to accommodate a small group of people, with the adaptation of an altar and an opening on the building roof for sun worship and the cult of the equinox. The community had conditioned space as the need for new religious practices arose.

Fig. 65. Horreum of Cesareia.

The Apollonia *Lararium* offers another interesting case in that the contexto of small lamps helps us understand the religious practices of Roman Palestine. Located in Sharon Plain, Apollonia is also on the coast, about 34km from Caesarea Maritima and 17 km from Joppa, in the middle of the interflow of these locations. Constructed on a carved platform on a natural carbonated quartz sandstone slope, the construction of the Roman villa was made with the local kurkar rock and the mortaria plasters consisted of lime and marble dust mixed with amurca (oil sludge) which supported the walls of the building. The villa was 21.50 x 24m, aligned perfectly with the reference of the four cardinal points. It consists of fifteen rooms, divided into eleven rooms, four corridors and a central peristyle. The peristyle courtyard was surrounded by pillars and four runners in parallel, occupying the central part of the building. The largest hall (loc. 1851/1768) is in the southern portion of the site, across the entire western construction east. At the end of the hallway is a wall with the rock matrix, where a carved niche. This *opus incertum* technique consisted of applying ceramic fragments as a way to enhance the thickness of the plaster and prevent cracks and leaks. The recess was identified as a *lararium*, a typical element of Italian dwellings.

Fig. 66. Villa of Apollonia, Sharon Plain.

Oil lamps in domestic Roman cults served as religious iconographic vehicles and were part of altar practices. The act of votive offerings to the gods, inviting them to the intimacy of the house, reflected in fact the primary design of the *Pax Deorum*, where coexistence was shared between humans and gods. Therefore, for the daily worship at home there was a separate "holy place", an altar to yield offerings; i. e *lararium* for this private practice. In this altar the paterfamilias of deities (protective deities ancestors) would be honoured in two daily rituals, one in the morning and another at night. During these rites the gods were flattered and requests for protection, care and prosperity would be made, with food offerings and other elements. The *lararium* was the place where people could worship the gods privately and render small offerings. Essentially *lararium* is the "sacred heart" of the house, where the forces of the gods could be brought to *saecularis* daily existence. The lucerne held the communicative duality of the rite through the lighting of the lamp act and the relationship with the flame of the object (Teixeira Bastos 2013: 43-44).

Fig. 67. *Lararium* from Apollonia.

The Pan shrine in Galilee serves as another context, with respect to the different religious practices in Roman Palestine and its relations with the ceramic material, especially small lamps. Six excavations seasons (1988-1994), under the auspices of the Israel Antiquities Authority, exposed the Pan Sanctuary esplanade with archaeological remains including six structures; 100 boxes with fragments and terracotta vases; about 2,000 kg of ceramic; about 200 kg of stone fragments; about 2,500 fragments of animal bones; 10 glass fragments boxes; fragments of about 10 altar; 200 marble fragments and sculptures in limestone (Berlin, 1999, p. 28). The small lamps and pottery found at the site allow for inferences about the reconstruction of ritual practices and devotional places in Roman Palestine. The small lamps and ceramics can be dated from all periods of the sanctuary occupation, thus allowing the establishment of a chronology and patterns of consumption. The ceramic material is especially instructive regarding the offerings of worshipers.

The Pan shrine is located below the cliffs of Mount Hermon (modern Banias), northwest of the Golan Heights. The sanctuary is located on a narrow terrace 250 meters long, at the end a huge cave which we know from one of the Jordan sources. The location is referred to in the writing of Josephus (Ant. 15.10.3, JW 1.21.3) and Eusebius (Eccl. Hist. 7.17). The Pan Sanctuary in Palestine kept the characteristic of places of worship in the Pan Empire, being located near caves and in rural areas or in their vicinity (Borgeaud 1988: 49-51). From the third century BCE to the fourth century

CE a temple to the Greek god Pan existed at the mouth of the Jordan River. Herod the Great's decision in 19 CE (Josephus Ant. 15. 363-64) to dedicate a temple to Augustus in the same Pan of Worship follows the patronizing attitude observed in relation to Caesarea Maritima with the building of the temple of Augustus and Rome, dedicated in Caesarea Maritima. Herod introduced not only a deity in the temple, but also a certain amount of official attention, money and status. Shortly thereafter, in the second century CE, Herod Philip, his younger and successor son in Galilee and Perea, chose a nearby area, below the sanctuary, for the location of his new capital, Caesarea Philippi (Tzaferis 1993). The Pan Sanctuary then went from a rural area to an urban and prestigious service with its reputation linked to the new capital.

Fig. 68.Pan Sanctuary representation in the Upper Galilee (Image courtesy of the Israel Antiquities Authority - IAA)

Excavations 1988-1994 (Ma'oz, 1993 and 1996) were carried out in buildings which include (from west to east, that is, from the oldest to the most recent - as represented in Figure 7): a) a temple (propylaeum) with porch in limestone and marble, probably the one that was dedicated to Augustus and mentioned by Josephus (Roller 1998: 190-92; cf. Ant 15.10.3); b) the so-called "Pan

Court and the Nymphs" so named by the inscription on the wall that is next to the carved niches in the rock of the site; c) a dedicated temple in the Trajan period or Adriano, called the "Temple of Zeus and Pan"; d) a second court, narrow, outdoor, accessed by a staircase, the "court of nemesis," also named after a dedicatory inscription, e) a building with three rooms and a paved area, called the "Tripartite building "with a high niche and f) an apsidal structure with two small rooms and a small shrine, called the “Pan Temple and the sheep" (Ma'oz, 1996) where the Pan shrine served as a great religious centre for Caesarea Philippi, whose population included Jews, Christians and Romans.

The amount and types of ceramics and small lamps help to observe the changes in the sanctuary ritual. The most noticeable difference is the sharp increase in the dedicatory oil lamps. Eastern sigillata A (ESA - the middle of the fourth century CE) was also found in the terrace structures. All the ceramic material can be dated using a combination of evidence from the numismatic material and inscriptions found at the site. During the beginning of the third century CE, the Tripartite building and the Pan Temple and the sheep were built and connected by a paved road. Both contained an identical, and distinctive, ceramic corpus consisting of a series of small oil-lamps of the saucer type, table vases, bowls and pans. This type of pottery was manufactured in the area around Caesarea Philippi (probably Khirbet el-Havarit in northern Golan). Most of the ceramic deposit was found below the Tripartite building floor along with a coin of Julia Maesa (220 CE), helping to establish the chronology of the site.

The ceramic collection of the late Roman period is surprisingly different from the previous one. Among the differences, the huge number of lamps in the initial Roman period is worth mentioning: 2,930 ceramic fragments were found at the site. Most of the assemblage (ceramic table 314, 607 ceramic cooking, storage containers 68) was formed by small lamps without visible marks of use. This condition indicates that the artefacts had a ceremonial character, and not a functional one. These lamps, as dedicated in a previous period, probably represent single individual offers (Berlin 1999: 37). Compared to 33% of votive small lamps found at the beginning of the Roman period of occupation, the dedication of small lamps in the Roman-late period rises to 62% during the Roman interim period and comprises 75% of the ceramics of the late Roman period of occupation. The increase is large and reinforces the importance of small lamps in economic and symbolic terms in Roman Palestine (Teixeira Bastos 2014: 99-108).

Fig. 69. Pan Sanctuary, Upper Galilee.

An increase of this magnitude must reflect the introduction of new rites that required small lamps in a different style of worship. Rites that require lighted oil lamps, especially in such a quantity, are commonly associated with the cult of mysteries, or perhaps an oracular shrine. An example can be seen in the temple of Poseidon in Isthima. The increase in the number of small lamps reflects a change in the rites. The exceptional abundance of oil lamps from the first century CE (compared to other periods too) indicates the popularity of nocturnal mysteries and small lamps as individual elements of communication, performance and practice as rites of worship (Broneer 1977: 23-92). Next to the Pan shrine in Kedesh, an oracular shrine probably existed between the second and third centuries CE contemporaneously (Fischer et al 1984; Ovadiah et al, 1993; Magness, 1990).

Of the votive oil lamps from the late Roman period, the majority (87%) of small lamps are the miniature saucer type – versions of the regular size of these models were found in the excavations at Caesarea Philippi, Tel Dan (Biran 1994: . 192, fig.1-2, 4), Dabura and Darda, in the northern Golan Heights (Hartal, 1989, p. 14.2, 6, 8) in Jebel Somak and Haruya, the slopes of Mount Hermann (DAR, 1978 pl 3.2-4); not to mention Har Senaim (Dar 1993, p. 1.1) which were classified mistakenly as from the Hellenistic period. These small lamps appear to have been specifically manufactured for votive and ritual offering at the Pan shrine (Rosenthal and Sivan

1978: 11-12;. Sussman 1989). They were simple, open forms and are reminiscent of the small lamps of the pre-classical period. The artefacts produced locally are derived from imported oil lamps of the disk-shaped type (the discus). The increase in votive offerings suggests more regular visits to the sanctuary and dedications which were less expensive than cooked offerings (the practice of the previous period). This change may be a result of the new status of the sanctuary as an urban worship área and devotees of this period were probably the inhabitants of the new city. The large number of cooking containers indicates that the use of clay lamps together with meal offerings continued to be made, but on a smaller scale. The continuity of the ritual meal reinforces the collective practices.

While the longevity of worship is generally seen as a reflection of the stability of religious life at the site, the archaeological evidence and the fundamental historical changes suggest that cult rituals changed over time. In the Hellenistic period, at nearby settlements worshipers brought their locally manufactured ceramics in which dedication meals were made (i.e. they spent some time on the site for its preparation). When the shrine became a civic temple in the first century CE, the dedications become simpler, with small lamps, some imported. During the second century CE impressive buildings and sculptures turned the shrine into a large religious centre, and private rites seem to lose ground during this period. Individual offers return during the third and fourth centuries CE, as indicated by the presence of a huge amount of small lamps of the type saucer which were offered, thus simpler dedications. The popularity of this cult artefact during this period is impressive and certainly relates to its metaphysical light attributes and derivations of this meaning. The sanctuary seems to have been abandoned in the mid-fourth century century CE. No evidence points to deliberate destruction, although during this period the sanctuary housed a traditional Roman cult in a city which was increasingly Christian. Services in areas such as the Pan Sanctuary were later discredited and linked to rural practices. The derogatory term *paganus* or pagan (relative to *pagus* versus *urbanu*s), is disparagingly used in the Roman Empire and the Christianization.

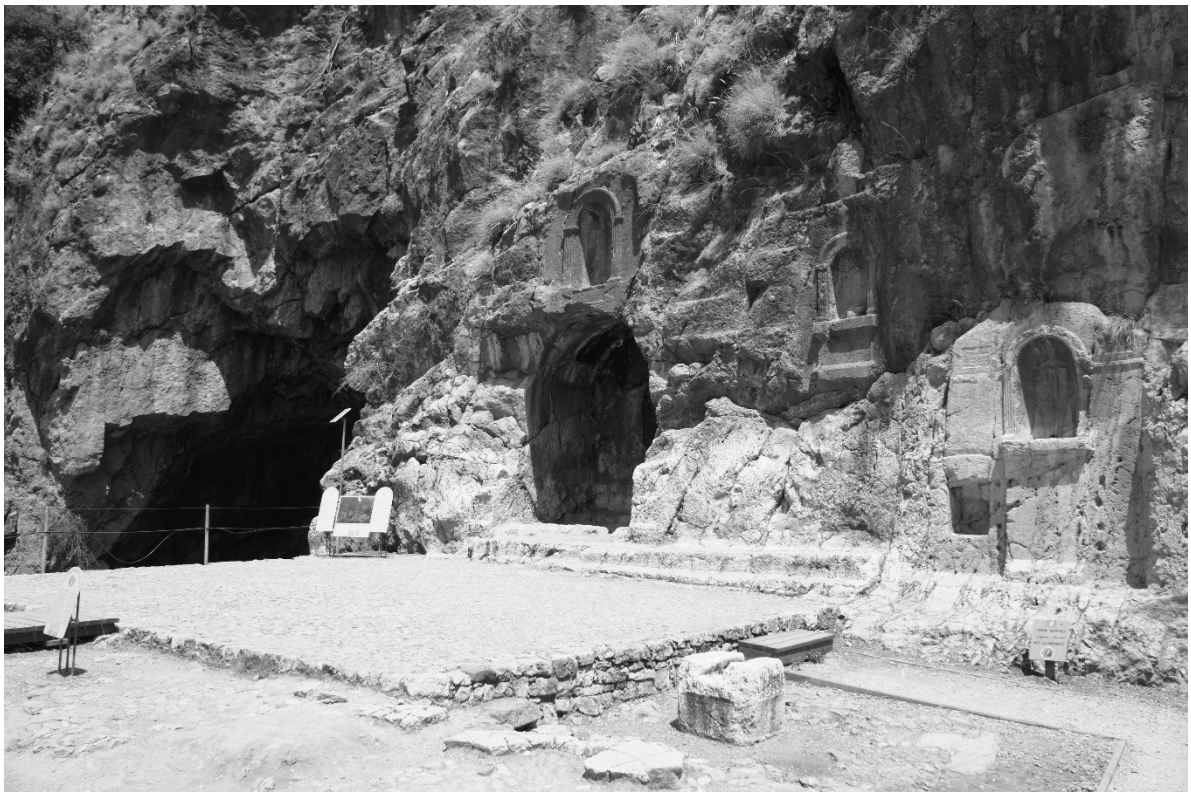


Fig. 70. Niches the Court of Pan and the nymphs.

Careful and contextualized analysis of the pottery of the Pan Sanctuary in each period emphasizes the nature of the ceremonies and offerings (individual service with lucerne); the deities to whom the offerings were dedicated; and the relationship between the temple and the city of Caesarea Philippi, Mount Hermon, the Golan Heights and the Hula Valley. Moreover, this evidence from a Roman temple during the Christianization process of Roman Palestine demonstrates the vivid permanence of traditional practices of the Roman religion.

The Temple of Augustus and the Court of Pan and the nymphs near the cave and its architectural elaborations provide physical evidence of sacrifice of sheep inside. There were no ceramics in the Augustus Temple area, except for a lucerne, nor the Court of Pan and the nymphs. In 148 CE two niches were added, according to a Greek inscription on the rock. One of these niches was for a statue of the nymph Echo, a Pan woman and deity who loved the woods and mountains; the other niche was dedicated to the statue of Hermes, the nymph Maia's son and father of Pan. The numismatic evidence found in the Panias site confirms the chronology (Berlin, 1999. p. 41-42).

The Temple of Zeus, in turn, was built around the year 98 CE, during the reign of Trajan to celebrate 100 years since the city was founded. A marble inscription found on the site says that the

space was dedicated to Pan and Zeus of Heliopolis (the city of Ba'albek). Only the foundations of the temple were found: originally the temple included a portico with columns and a hall where the rites were conducted. The Corinthian capital from a column that was part of one of the four temple facades was found on the site. The numismatic evidence of the site indicates that there was a statue of Zeus in the hall, behind the facade. The Temple of Zeus and Pan and the Nemesis Court were both built directly on the surface of the terrace, and the stratigraphy in this part of the site indicates that occupants in the medieval period demolished and reorganized the space, destroying the interior of this building. So no ceramics from the area can be directly linked to this sanctuary building during the second century CE.

The Court of Nemesis (goddess of vengeance and Roman Justice), was located in a long and narrow corridor which was built in 178 CE, in front of a large niche that housed the statue. The inscription in Greek above the niche mentions the names of the goddess and the donor. Dedications were made on marble sculptures and include seven life-size statues of nymphs and gods, including Apollo and Asclepius; and smaller statues of Artemis and Hermes (Friedland 1997: 272). The building, the niches, and the sculptures provide evidence of the constant and generous sponsorship of the sanctuary during this period.

The Pan Temple and the sheep was built around 220 CE, during the period of Emperor Heliogabalus. The bones of the sheep that were part of the ritual were placed in a rectangular niche in the main hall with ceramic offerings, food, glasses and coins. The ritual was conducted on the terrace (roof) in front of the niche carved into the rock. The structure barely survives, with only the north wall and part of the semicircular hall (apse) visible. The same structure is depicted on the numismatic evidence of the site which also depicts Pan playing the flute for three sheep dancing in the apse. The musicians are portrayed sitting on the stairs next to the niche. This rite ensured the fertility of flocks and pottery decorations also attest to this rite (Ma'oz, 1996, p 1-2;. Berlin 1999).

There are virtually no late Roman ceramic imports from the Caesarea Philippi excavations, Tel el-Wawiyat or Tel Dan (Brian 1994: 233), or in the north and centre of the Golan Heights, or Hammat Gader (Ben Ariech 1997: 356 -59). Evidence of ceramics, both from the sanctuary, or the city, suggests that the Panion (Pan Sanctuary) received no other dedications after the fourth century CE. The last two sculptures had fragments of a miniature Eros torso and forequarters of a bovine, which have been dated on stylistic grounds to the same period (Friedland 1997: 70). An almost complete gap in the numismatic record of the site occurs between the beginning of the fifth and

sixth century CE and can be interpreted as an indication that no activity occurred on the site during this period. The abandonment of the sanctuary and depopulation of Caesarea Philippi accompany the overall decline of the eastern Upper and Lower Galilee and the Hula Valley in the Byzantine period (Adan-Bayewitz 1993: 240-43).

9.3. Playing the difference

In addressing the symbolic practices in social groups, the hierarchy of what is often called tradition is often misinterpreted. The way social dynamics are treated leads to another idea that it is an accumulation of knowledge, practices and symbols, tightly bound and monolithic.

The tradition should be seen as a symbolic process in which the actors interacting with fragments of the past, interpret and reinterpret those memories, so that they are in constant contact with other social groups and play certain roles, and through the associations that make this process issues of "who we are", "where we come from" and "what we can be" arise (Hall 1997, p. 4). In the cognitive dimension of this process it is mainly the reification and maximizing distinction that is intrinsic to the definition of "self" and "other" (Jenkins 1994; Levine, 1999). In recent renderings of identity, this cognitive dynamic is a permanent feature of relations between social groups, and the actors infer the disjunction of objective and subjective identity through the symbolic meaning. Focusing on the symbolic conflict groups, they adjust and transform the meaning, the property and the value of the devices present, in particular (the) tradition (s); that is the disjunction of knowledge, names, practices, symbols and rituals, in the search for legitimacy in the face of hegemonies.

Hegemony can be understood as a "prevailing consciousness" in constant negotiation and change among interest groups, transcending what is commonly defined as "ideology", precisely so that this relationship can include the experience. Thus it is internalized or accepted at different levels by the members of these social groups. Hegemony as a set of expectations and practices for living, includes feelings, allocation of energy and perceptions that shape our surroundings and

ourselves. This is a vivid system of meanings (constitutive and constituents) that when experienced as practices are confirmed through reciprocity and encourage the changes (Beaudry et al, 2007). This apprehension provides a sense of reality for most people living within society, and this sense of absolute, the result of experienced realities, promotes the idea that it is difficult to move beyond the hegemonic set that is necessary to group members. However, as you can see, hegemonies are always changing with the coming of new meanings, new rites and devotional places for human groups.

CASE STUDY 2: North Africa

10.The Archaeological-Archaeometric Evidence and pottery production centres

North Africa has long been renowned in the popular imagination, but also in academic literature, as the 'Granary of Rome'. Indeed this is an idea heavily associated with Roman period occupation in North Africa and is linked to theories about climatic change in the late Roman period and its negative effects on the Maghreb region. For the post-Roman period, debates about the destruction of the Roman achievement by armed invaders, mainly by the vandals and the arabs, also abound. The armed invaders and climatic change are thus two topics that have been frequently found on the research agenda for the region. It is generally thought that favourable climatic conditions in North Africa, marked above all by higher levels of precipitation, permitted the economic development of the region as part of the Roman Empire (Shaw 1995: 34).

These assumptions are partially true: there is no doubt that North Africa was one of the major grain exporting regions that supplied the urban populace of Rome. The six provinces west of Egypt that constituted Rome's empire in North Africa covered the land area of the northern zone of the present-day states of Libya, Tunisia, Algeria and Morocco (the last three being the Maghrib region). It was only after the annexation of the western ottoman Empire by European powers that the remains of large Roman cities, such as Lepcis Magna and Timgad, were surveyed in the midst of desolate landscapes, as well as villas and farmstead complexes in the deserted countryside. Research dedicated to the reconstruction of North Africa's Roman past had recently increased as previously it was poorly understood with many archaeological remains lost, however this is a glorious episode of the development and wealth of Rome's history.

The extensive and impressive ruins of the Roman period contrast with the semi-arid environment of these countries today. At any rate, the striking antithesis between past and present has been considered as a conspicuous general ecological decline that during historical times would had affected the whole region of the Maghreb (Shaw 1995: 382; Trousset, 1974:15-21, 162). However, climatic change is not a good enough explanation and negates the innate capacity that people have to overcome adversities and contradict previous prognostics.

Each of the major categories of African sigillata were probably tied to the agricultural productivity of Rome's North African provinces (as indicated by the spread of Roman-period amphoras), but the rise of pottery production is not just related to environmental conditions or economic growth, rather these aspects are strictly tied to flows of ideas and goods from the Mediterranean. Taking into account these considerations, I will examine evidence of workshops and their petrographic characteristics (and if appropriate, also geochemical aspects), with the aim of providing identifications for production zones or ateliers of oil lamps in North Africa. Due to the shortage of available information on other regions of N Africa (e.g. Libya, Algeria and Marroco), I will be focusing on material recovered mainly from sites in NE and central Tunisia. However, first it is necessary to outline what kind of information is available for this analysis.

Fig. 71. Oil lamps - *African Red Slip* (ARS) found in Italy, Cripta Balbi, Roma.

The study of pottery lamps in Roman Africa still owes much to museum catalogues, which commonly look primarily at the linear progression of form and decoration of artefacts. The most popular typology for Greek and Roman lamps found at Tunisia is the pioneering catalogue of J. Deneauve (1969) of lamps storaged at the Bardo and Carthage museums. As pointed out by Rossiter (2009: 93), since the appearance of Deneauve's work, N African lamp studies have progressed with a number of new studies based on collections located in N African (e.g. Carthage and Sabratha) and

outside museums, such as the British Museum and Biblithèque Nationale (Ennabli 1976; Joly 1974, 1995; Bailey 1988; Trost and Hellmann 1996). In addition, several recent publications of fragments of lamps found during excavations and survey at different N African sites, such as those lamps founds at Carthage as part of the UNESCO-sponsored programme from the mid-1970s to mid-1990s; as well as the reports from Raqqda necropolis, kiln sites at El Mahrine and excavations at Oudhna (Uthina) and at Leptiminus (Lamta) (Anselmino 1982; Rossiter 1988; Knowles 1994; Bechtold and Schmidt 2007; Ennabli, Mahjoudi and Salomonson 1973; Mackensen 1993; Ben Hassen and Maurin 2004; Hayes 2001). More holistic studies include L. Anselmino and C. Pavolini's (1981) major study of pottery lamps from Tunisia.

The frequent lack of context information for the lamps and the consequent lack of meaningful dating and evidence from the publications about Tunisia sharply contrasts with publications from outside Tunisia, in other North African regions. Studies of north and central Tunisian producers need to be more comprehensive and incorporated into the mainstream of North African lamp studies (Rossiter 2009: 103). In any event, reports on lamps from excavation in Libya, in particular Sidi Khrebish (Berenice) in Cyrenaica and the 3rd-c. military site at Bu Ngem in Tripolitania (Bailey 1985; Rebuffat 1987), also J. Bussière's (2000; 2007, 2008; Bussière and Rivel 2012) wide-ranging classification of pottery lamps from Algeria, are precious and valuable studies that provide a better idea of the distribution and circulation of oil lamps in other regions of North Africa. The most important ARS lamp production sites have been located in the region between Kariouan and Sbeitla (Mackensen and Schneider 2006: 165, fig. 1). N(E) Tunisina ARS ware in A1 and A2 fabric - late-1st to mid-late 2nd CE; A2 late 2nd to early mid-3rd CE; N Tunisian ARS ware in A/D - Sabratha group - late thrid of 2nd to mid-3rd CE; Sidi Marzouk ARS ware in C1 and C2 fabric ARS 3rd; Henchir el-Guellar - ARS ware in A/D, C1 and C2 3rd) and Oudhna production site of the decorated A sigillata (Bonifay 2004: 47).

The production of oil lamps in North Africa reached high level production and were distributed throughout the Mediterranean basin. While Anselmino and Pavolini remain the definitive typology of ARS lamps produced in Byzacena during the Late Roman period and Bussière's research offers an overall picture of pottery lamps found from the Punic to Byzantine period in Algeria, M. Bonifay's work has added a new chapter to lamp (and other pottery classes) research.

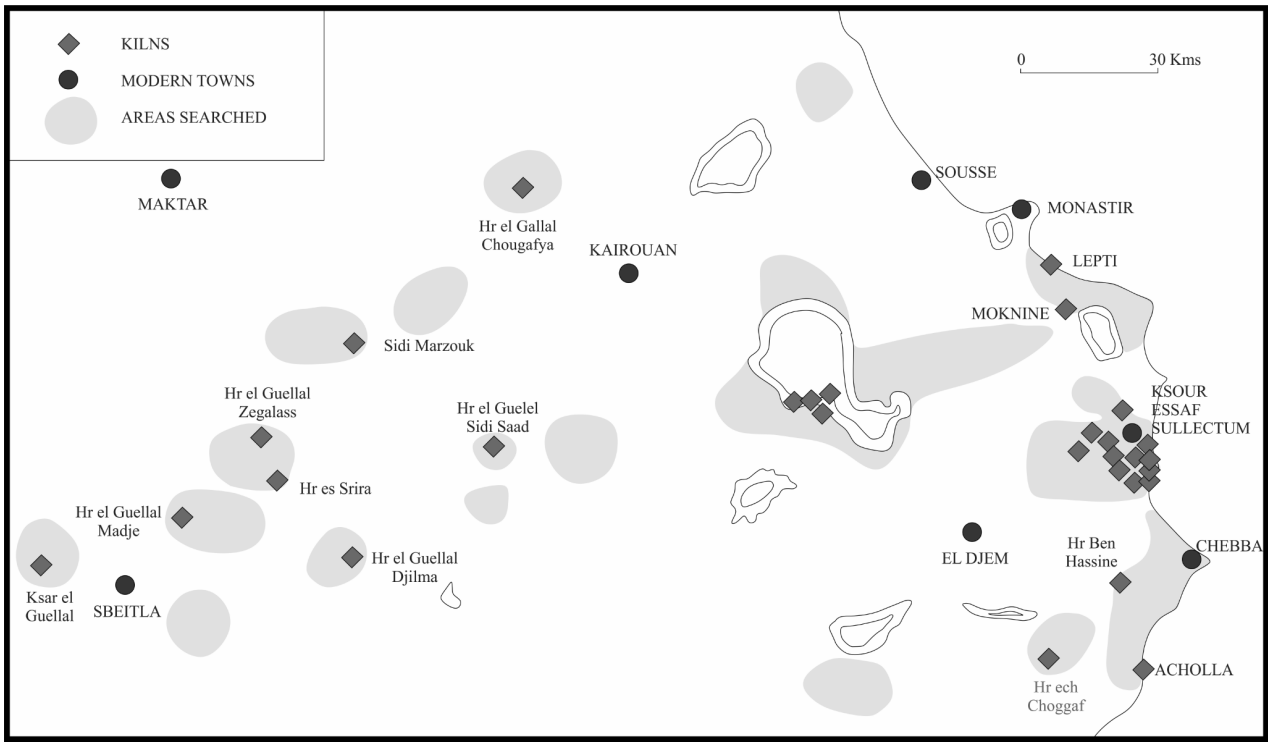


Fig. 72. Kilns and ceramic manufacturing area in Tunisia (Bonifay 2004).

Bonifay (2015: 312-430) created a new typology for pottery lamps produced in Tunisia during the Roman and post-Roman eras. Largely based on a reworking of Deneauve (whose typology mainly rests on nozzles forms) and Anselmino and Pavolini's Atlante volume, Bonifay outlines the 85 types of lamps identified, and the multiplicity of variants within each type. For instance: N African brown-slipped lamps (2nd-3rd c. CE); African lamps based on Italian models (Types 1-3); "Classic" Romano-African lamps"; African buff ware lamps (4th-5th c.) - Derivatives of classic African lamps; Buffware lamps - lampes à côtes de melon" - pump kin lamps; African red-slipped lamps - beginning of ARS lamp production; "Classic" ARS lamps; Atlante form VIII lamps; Atlante Form X lamps and Byzantine pot-lamps. The new typology emphasizes a broader set of type markers, including nozzles, handles, dimensions, decoration, and bases. Bonifay's work finally covered roughly the part of N and central Tunisia which includes Carthage and its hinterland, as well as the Cap Bon peninsula and coastal sites as far south as Soussel. Sites such as the *Pupput* necropolis, Sidi Jdidi, Oudhna and Nabeul also received attention as a result of recent excavations by French and Tunisian research teams.

A large quantity of pottery lamp fragments that come from major deposits excavated in the area outside the back wall of the Circus in Carthage dated (according to pottery and coin evidence) mainly from the late-4th to early-5th CE and were chosen for a well-defined petrographic study in

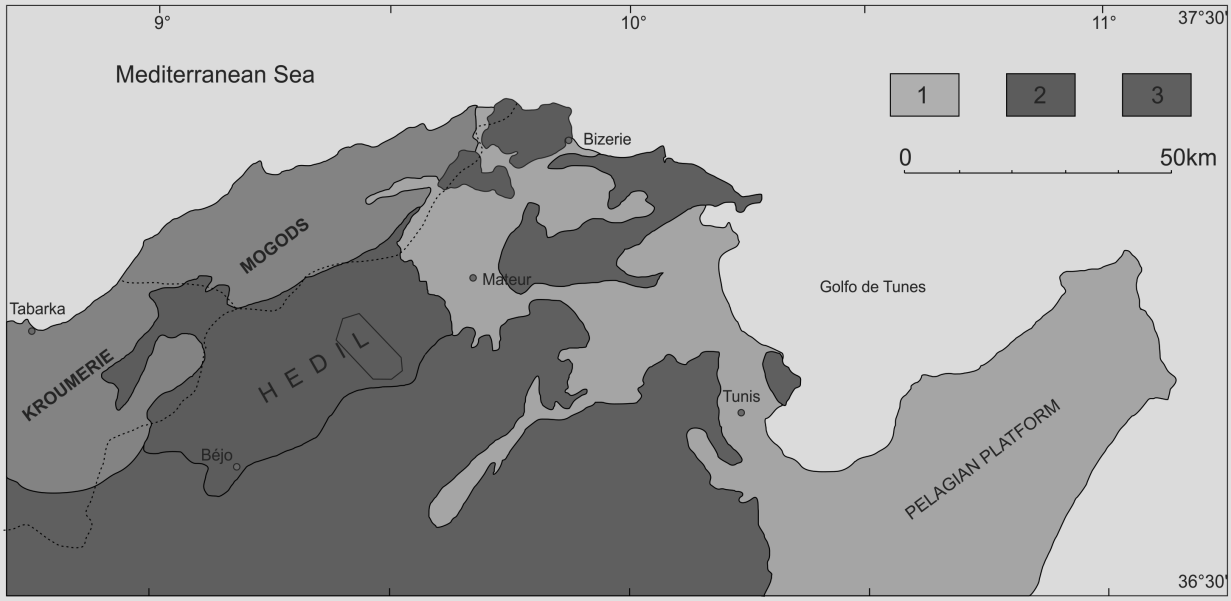
this thesis. The lamps were studied and published by J. Rossiter (1988) and most of fragments were of ARS lamps (Atlante Form VIII) and their various subtypes (Atlante Forms VIIIb-c; FormVIIIb; Form VIIIc1; Form VIIId; and Form X - Hayer Type2). However, in addition to these major groups, the deposit also contained a number of other buff ware lamps, mostly forms deriving from standard 2nd-3rd century CE types (Rossiter Groups 2, 3 and 5). Twelve fragments of those lamps were selected for Petrographic analysis[64] with the aim of checking the provenance and providing new evidence for the activity of the local lamp industry at its early stage of development. It is important to check these because the impression given by the range of types represented in the North African lamp industry - many of the standard mid-Roman types - seems to suggest production well into the 4th century CE (Rossiter 1988: 531).

Bonifay's studies on Petrographic and Geochemical analyzes performed on pottery material in North Africa shows that the main workshops for African Red Slip Ware - ARS - can be located in North and Central Tunisia, mainly on the sites such as Bordj el Djerbi, Oudhna, Sidi Khalifa, Sidi Marzouk Tounsi, Henchir el Kebir or near to El Mahrine, Henchir es-Srira, Sidi Aïch area. Also non-coastal areas, such as Henchirel-Biar, Henchir el Guellal (Djilma) has been confirmed as a centre for pottery making in the region (Mackensen and Schneider 2002; 2004 and 2006).

Those regions present traces of miocene sedimentary sequences (Fortuna Formation) rich in clays coarsely aligned south-west / north-east on the basis of the reliefs of the Tunisian Ridge, which are apparently compatible with the composition of the fabrics from the workshops. The southern limit of these clay deposits (Sidi Marzouk Tounsi / Henchir es-Srira) shows marked differences in the composition of sigillata produced on the Tunisian Ridge (Bonifay et al 2012; Yaich et al 2000). So the location of the workshops follow specific technical requirements related to the characteristics of the raw materials needed to production of African sigillata: clays rich in iron and quartz inclusions and poor in calcareous components, necessary for large-scale standardized production and the presence of water. The Pliocene Miocene formations near the coast do not have this type of clay, apparently chosen by workshops for mass sigillata production. A Neogene oceanic crust occurs beneath the majority of the Western Mediterrranean, although most of the Albertan Sea

[64] I would like to thanks Prof. Jeremy Rossiter to kindly provide the samples for the analysis.

is underlain by both Neogene oceanic and continental crusts (Tawadros 2011: 51, 86, 455-500; Gennesseaux and Stanley 1983: 1-20; Cohen et al 1980: 225-237)[65].



Index map of northern Tunisia.
1 - Numidian flysch nappe
2 - Imbricate Thrust Zone
3 - Zone of Diapirs (Stydy area within the southern Hédil is outlined.)

Fig. 73. Geological Map of Tunisia.

The Tunisian Plateau presents a *Nummulites* vascus Horizon, which is overlain by a succession of Oligocene-Lower Miocene terrigenous to marine sediments of the Fortuna Formation, Ketatna Formation, and the Salammbo Formation , in addition to the Numidian Flysch in Northern Tunisia.

The lithostratigraphy of Miocene sediments in Tunisia, specially related to Fortuna Formation Oligocene-Aquitanian, shows a complex distribution of sedimentary sequences as a result of the interplay of tectonic, eustatic and climatic factors of Tectonic activity during the late Oligocene and early Miocene (Tawadros 2011: 493-500). Dirbal and Ras Abd Jalil Formations in Libya are equivalent to the Basal Miocene sediments in Tunisia, which are commonly conglomeratic and unconformably overlie older sediments (Hammuda et al. 1991; Tawadros 2011).

[65] Hammuda, O.S., van Hinte, J.E. & Nederbragt, S., 1991. Geohistory analysis in central and southern Tarablus basin, northern offshore of Libya, in M.J. Salem. O.S. Hammuda & B.A. Eliagoubi (Eds.), The Geology of Libya, v. IV, Elsevier, Amsterdam, pp. 1657–1680.

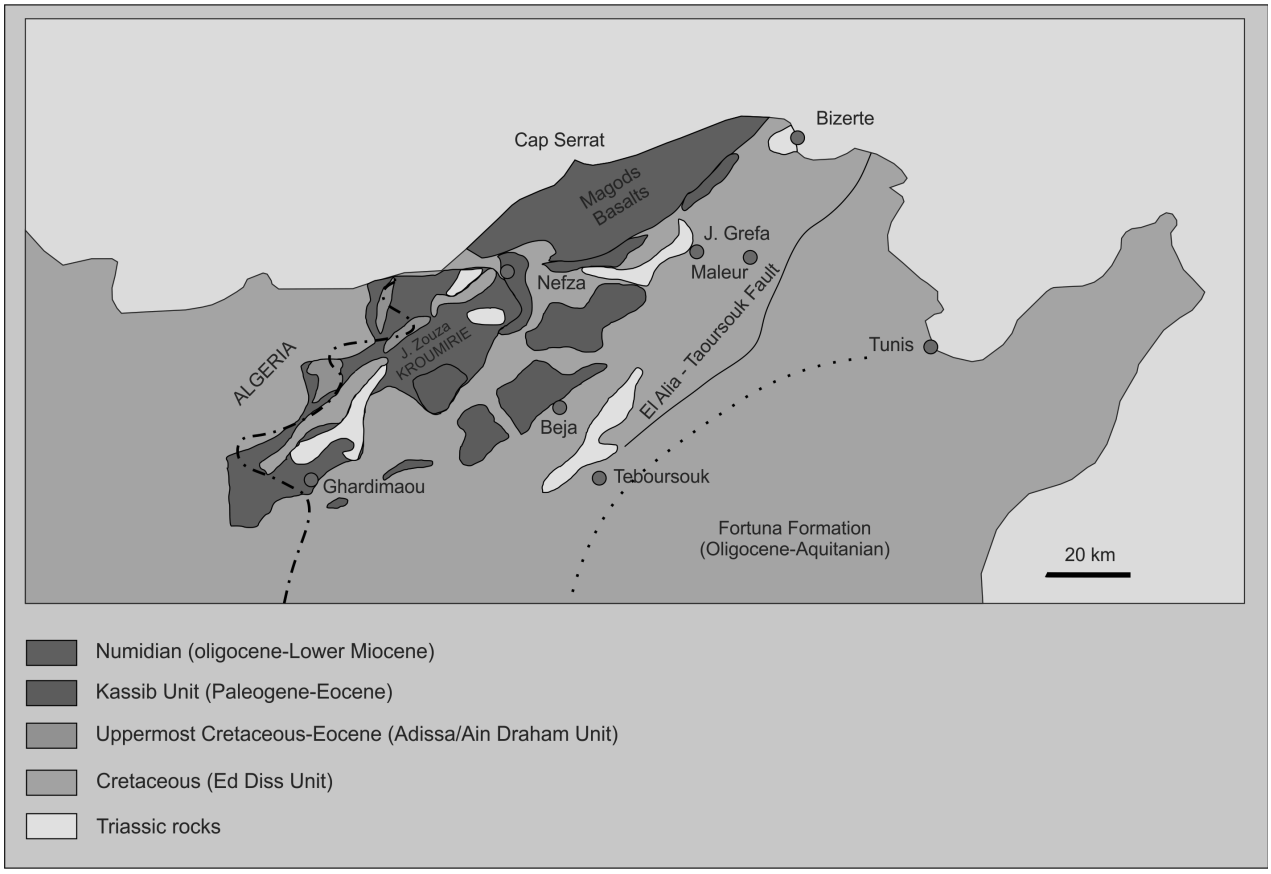


Fig. 74. Fortuna Formation, Tunisia.

The archaeometric data allow us to propose the presence of quartz sandstone as a discriminating characteristic of northern Tunisia, not only for the sigillata categories for African sigillata A1 and A2, but also for African sigillata D from El Mahrine, Oudhna, and workshop "X"; as well as for culinary cooking vessel types A and C and even some amphorae. Some textural characteristics, technical and compositional aspects observed by petrography (including: fine paste, thin slips, presence of shales, mica and/or microfossils in many cases) could provide some common denominators for Tunisian Central and Southern productions. The geochemistry used by Bonifay's (2007; 2010; 2012; 2013) studies allows for the identification and association of the compositions for Northern and Central workshops, but also other Tunisian workshops with slightly different compositions belonging to the same family of clays. In general, the products of N and central Tunisia seem to be different from other African sigillata productions, known in the Libyan part of Tripolitania and Eastern Algeria, in technical or compositional terms.

The workshop identified in Henchir es-Srira is distinct both geochemically and petrographically; particularly through a high rate of sodium and titanium (TiO2) / magnesium (MgO) singular presence, and by the thin paste with a relatively clear clay matrix, fine inclusions (<0.2 mm), rather abundant, where quartz is associated with mica, and finely granular clay and yellowish orange opaque varnish covering the whole vessel (Bonifay et al 2012: 54; Carandini 1981:139; Mackensen and Schneider 2006: 178). Another pottery production that can be distinguished by this analytical methodology is Sidi Aïch. Chemical analysis reveals a number of discriminating criteria among which the high rate of potassium and a silicon ratio (% SiO2)/ aluminum (Al2O3%) original. This production is further distinguished by relatively high levels of calcium (CaO), magnesium (MgO), sodium (Na2O) and conversely a low rate of zirconium (Zr). In petrographic terms, the paste is characterized by scarce silty inclusions, with subordinate quartz mica and numerous microfossils dissociated, fine sand inclusions (0.1-0.2 mm) well ranked, rather abundant and sub-angular, with relatively grainy paste and brown-orange and red-brown colour. The typology and decoration of this pottery production is fairly well known.

In Libya, the Tripolitanian Sigillata, or Tripolitanian Red Slip ware, is a production attested in southern Tunisia and Libya in contexts of the fourth and fifth centuries. The analysis by thin section of several samples shown on the Leptis Magna website shows good homogeneity of the paste (which suggests a single origin) with rare inclusions of rounded quartz (probably wind sand) and frequent fine-grained sub-angular quartz with several micro-aggregates of iron oxides. Unlike most African pastes characterized by a clay matrix rich in iron oxides, responsible for the red or orange macroscopic colour, no visible slip is present under the microscope in the analyzed samples. The production points to the hinterland of Leptis Magna, but further analysis would be needed to confirm the hypothesis of a local production or micro-regional trade for Tripolitanian Sigillata present at Leptis Magna (Bonifay et al 2012: 54-55). The bright orange well-fired pottery, whether or not coated with slip, was sporadically exported on Mediterranean trade routes. Other North African pottery production centres that deserve to be mentioned are the eastern and central Algerian sigillata workshops. These productions are well documented notably on consumer sites such as Djemila Setif and Timgad, and existed in the region of the high-plains, straddling the provinces of Numidia and Mauretania sitifienne. Only two workshops are known, one in Tiddis (west of Constantine), the other at Diana Veteranorum, but they remain poorly documented and none has been archaeometrically analyzed.

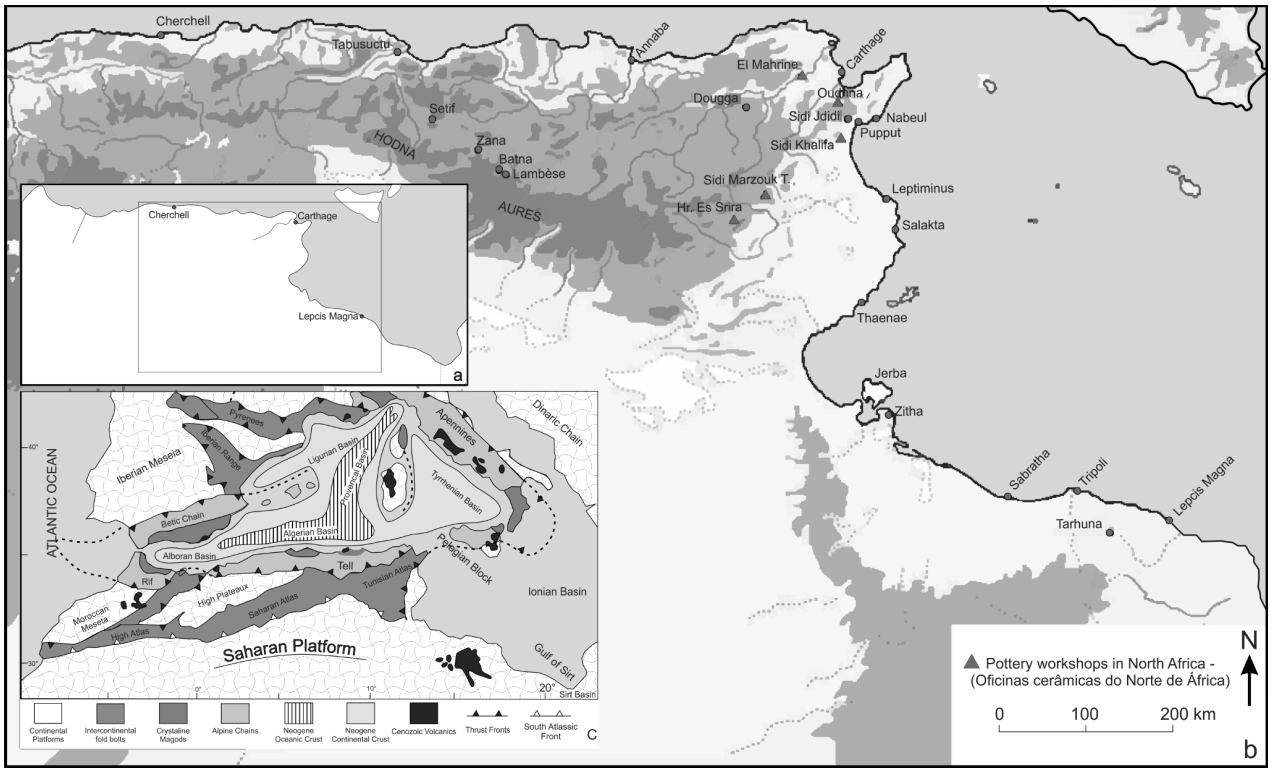


Fig. 75. Pottery workshops in North Africa (Capelli and Bonifay 2014: 246).

As pointed out by Bonifay et al (2012: 56) it is impossible to assign workshops to all sigillata excavated in North Africa, and or those found on other Mediterranean sites. But ongoing petrographic studies are increasing our knowledge and reveal a wide variety of productions that are not comparable to conventional products and probably are an indicator of production at the local level for secondary workshops. This type of secondary workshop was present in Nabeul, including three production sites of amphorae for a single period (fifth century CE). They are technically inferior to the main productions, as in the case of Sidi Aïch, a peculiar composition close to the general chemical characteristics of clays that have been used for the production of African sigillata. This distinction was made by comparison with all other workshops related to the ratio of silicon (SiO2%) /aluminum oxide (Al2O3%) and titanium (TiO2%) / magnesium (MgO%).

In the Nabeul area, there are three sets corresponding to three geographic zones that can be distinguished mainly on the basis of differences in texture. In petrographic terms, the three areas A-B-C match, but not exactly, and there are three different geological formations that can be highlighted, respectively: Pliocene, Mio-Pliocene ad Quaternary. The paste of two zones (A and B) are characterized by many fine inclusions of quartz and microfossils with major wind-blown quartz grains and fragments of quartz sandstone accessories (Capelli and Bonifay 2014: 238). However,

these two paste areas and workshops can be distinguished by minor differences in textural features and the relative relationships between different components. The pastes that characterize workshop area C are different with a purer matrix and quartz inclusions classified according to the Geological Map of Tunisia (*Carte Géologique de Tunisie*).

Rossiter (1988: 532-533) suggests that the majority of the buffware lamps found in the deposit of the cemetery of Carthage were local products, made in workshops in and around the city. Thus, the lamps sampled probably came from the Sanctuary of Tanit in Carthage, where a lamp kiln producing the kind of plan globular lamps which were present. Beyond the confirmation of petrography for local sediments, the evidence of potter's marks points to the same conclusions. We can associate the names found on lamps from the deposit (*NVNDINVS* and *PASCVS*), which are known almost exclusively from lamps found at Carthage, with the production of the lamps under analyses. Others workshop marks, such as *AVGENDVS, Q. MARCIVS, MAVRICIVS, PVLLAENI* have a wider circulation during the period 2nd-3rd CE with local products perhaps operating as authorized workshops of more widely-established North African lamp making firms.

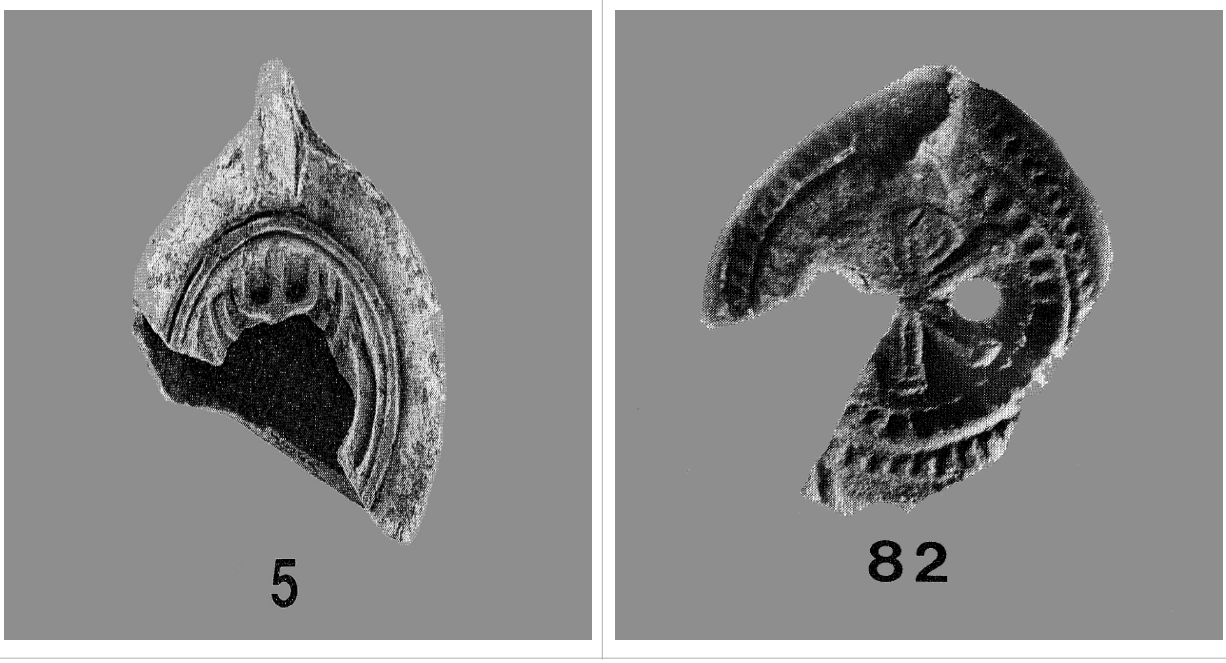


Fig. 76. Clay lamps with menorah and chi rho.

The Central Tunisian pottery centre sites at Sidi Marzouk Tounsi (TiO2), Henchir es-Srira (Fe2O3, Na2O), Henchir el-Guellal (Djilma - MgO, CaO, K2O, Na2O) (late-3rd to mid 5th centuries CE) are chemically similar to the reference groups of the late-antique potteries at Tebourba (TiO2, AL2O3) and Oudlhna (MgO). The suggestion of Sidi Marzouk and Henchir el-Guellal (Djilma) seems more plausible for the provenance of the lamps sampled from Carthage (cat. nos. TB90-101). In Sidi Marzouk there is evidence of a great variety of slightly new decoration techniques for ARS with high level innovative and skilled craftsmanship, made during the early 3rd century; while in Henchir el-Guellal (Djilma) there is production of plain A/D/C1 and C2 forms of ARS and red-slipped lamps; this site is regarded as a major production centre in NE Tunisia (Mackensen and Schneider 2006: 179).

In Sidi Markouk Tounsi many forms of red slip lamps forms Hayes II A/ Atlante X Ala, X A2, XI B1, 2-nozzled lamps Atlante X A1d, XI A1b, XI B2, var. and lamps Atlante XII with 7-12 radiating nozzles were found. In Henchir El Guellal (Djilma) there is a lamp fragment with a heart-shaped nozzle and relief decoration of a female figure standing with a winged Cupid seated on her basket, of type Atlante I/Salomonson I; and in Henchir Es-Srira red slip lamps are in the forms Altante V, VIII A1 and A2, VIII B, VIII C1 a/b. A clay lamp fragment with a palm motif on a rather flat shoulder is similar to type Atlante V from Henchir es-Srira and was related to moulded relief-decoration of the Navigius workshops (see Mackensen and Schneider 2006: 183-88). Therefore, the sites of the Late Roman lamp-production centres of el-Marine and Henchir el-Biar in the NE Tunisian hinterland of Carthage, south of Tebourba/Thuburbo Munis, would be the most probable candidates for the provenance of the lamps sampled in this research (see also, Mackensen adn Schneider 2006: 164).

The African red-slipped fine ware tradition started in the last third of the 1st century CE, with major importance in the mid and Late Roman times, distributed regionally and throughout the Mediterranean basin, and the adjoining provinces of the *Imperium Romanum*.

11. Centres of production and Patterns of International, Intraregional and Interregional distribution

A regional and supra-regional perspective is increasingly required to explain, or at least improve our understanding of certain political, economic, and other phenomenae. Bes and Poblome (2007) point towards changing attitudes about the methodology of Roman pottery studies. The production of African Red Slip ware (ARS) began in Northern Tunisian, specifically in Carthage to supply the intra-provincial market (Hayes 1972: 296)[66]. Initially imitating Italian Terra Sigilata models, the evidence of ARS at the end of first century CE from the necropolis of Tipasa and Sétif (Guéry 1987: 132-133)[67] suggests that the later changes progressed with time according to the needs of mass production – that is, standardization and simplicity to save time and money. Several forms[68] of ARS were distributed from Carthage into the Passerine area and the circulation of the new African ceramics depended on the location of both coastal and hinterland centres of production.

By the 2nd century CE onwards, the production of ARS became autonomous with the forms Hayes 27, 29-33 and 43-44 (Hayes 1972: 15; Heslin 2008: 62). Apparently during the early 3rd century CE local productions overlap importation (and the average vessel size increases) and a intra-provincial distribution mainly consists of productions from the east central Tunisian workshops. Away from the northern Carthage region wares, during late third and early fourth centuries at least two local Kasserine wares, from Henchir-es-Srira and Sidi Aïch catered for local markets and were also distributed to Tripolitania and western Byzacene and Numidia (Stern 1968: 147). ARS also grew in importance, geographically and quantitatively, in the course of the 3rd century CE in the Eastern Mediterranean and by the second half 4th to early-5th century CE, the Eastern Mediterranean formed part of a Mediterranean-wide koinè of tableware distribution (Bonifay 2005: 566-568).

[66] Hayes, J.W. 1972, Late Roman Pottery. London.

[67] Guery, R., 1987, Les marque de potiers sur *Terra Sigillata* découvertes en Algérie. II. Sigillée tarda-italique. AntAfr 23, 149-192.

[68] included Hayes forms 3, 4, 5, 6, 8, 21, 22, 23, 26, 27, 181 and 182

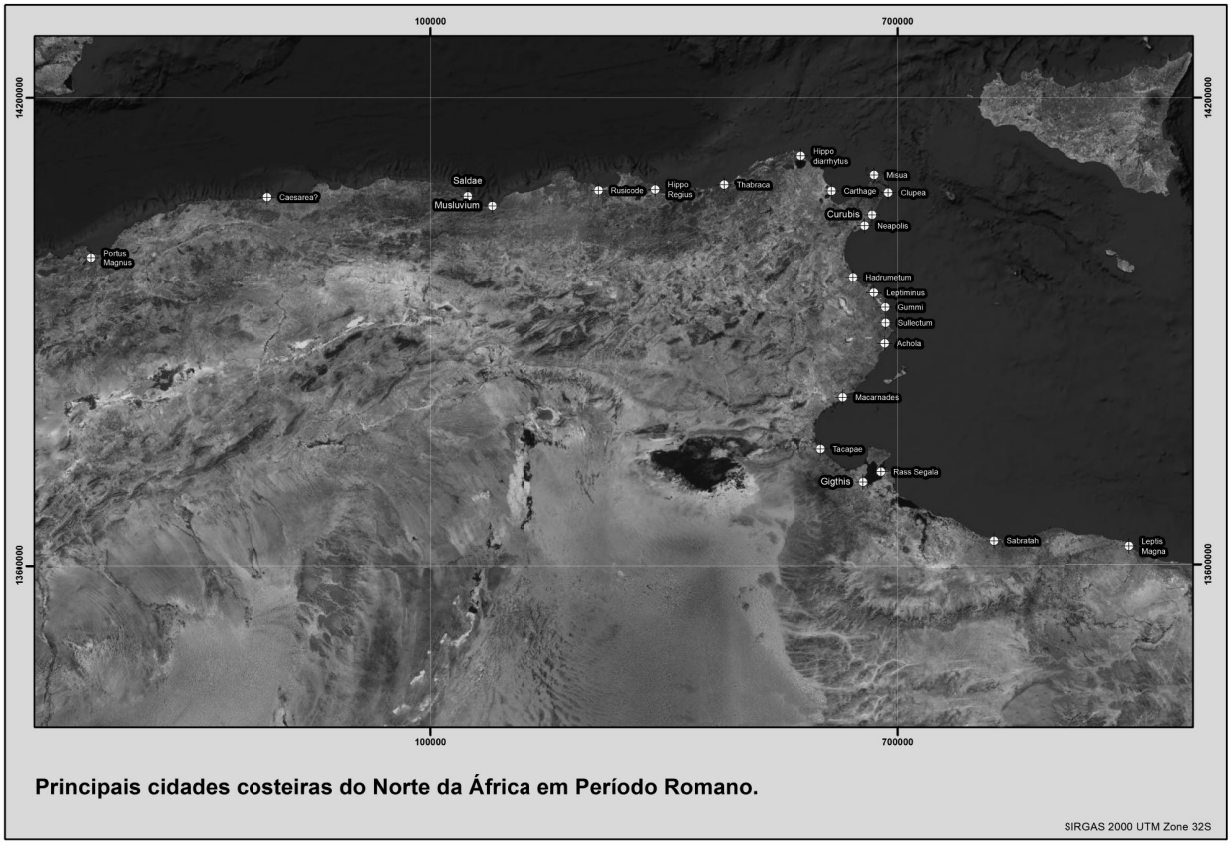


Fig. 77. Major coastal cities of North Africa that were part of the ceramic distribution koiné in Roman Period.

Thus, ARS established a dominance from the late 2nd to 3rd CE, spreading by the mid-4th through the Eastern and Western Mediterranean on a large-scale with supra-regional exportation that continued over more than four centuries. A second florescence occurred in the late 5th to early-6th CE, but from the 7th CE onwards finds of ARS are more rare. Roman control of the sea routes probably consolidated the dominance of ARS and its distribution patterns. Cultural factors may also have played a role in the controlling of these trade routes, although natural factors equally affected fluctuations in the quantities of goods following certain shipping routes. The different geographical regions encompassed direct and/or indirect contacts between settlements and sites, but exchange mechanisms had diverse motivations and different cultural frameworks, suggesting that the intensity of the distribution of goods connected regions to Mediterranean-wide exchange patterns in different ways (Bes and Poblome 2007: 8-9).

Red-slipped fine pottery appears to have been traded all around the Roman Empire and was widely popular. The majority of fineware producers in the East and West were probably small-scale potteries located on rural estates or just outside towns, where they distributed their wares (Lewit

2011:314-315). Eventually such local and regional pottery industries expanded to produce on a larger scale, reaching a much wider market, but with products and influences. Reynolds (2010: 90-93) highlights that ARS at Beirut makes up more than 51% of the fine ware in the mid-3rd CE and more than 91% during the mid-4th CE. The majority of Roman oil lamps found in Palestine demonstrably originate from Lebanon (Tyre, and possibly Beirut) which suggests a relationship between the rise of oil lamps connected to social-religious affiliations with Palestine during 2nd-3rd CE and a market that takes in Lebanon and North Africa, especially after Septimius reign.

Christian and Jewish symbols depicted on the central part of lamps replaced those icons and themes that were dedicated to polytheism, thus helping to transform and establish different degrees of cultural interaction between Palestine and North Africa. I will approach this subject with more details in the next chapters, but for the moment it is enough to say that pottery developed in the context of a particular cluster of exceptional stimuli existing in combination with its own dynamic and clay lamps emerged as clientele indicators (Lapp 2006) on the Mediterranean-wide outflow of exchange patterns.

Bonifay (2005) attempted to conciliate typology and petrographic research to locate pottery workshops. Focusing on three neighbouring cities of the necropolis of *Pupput*, plus Sidi Jdid and Nabeul (in the northern Gulf of Hammamet), and the site of Rougga-Bararus (near to El Jem), Bonifay pinpointed the main areas where the production of oil lamps could have taken place.

During the excavation of an urban necropolis in *Pupput* (Hammamet) used from 2nd to 4th centuries CE, around 600 oil lamps were found; in Sidi Jdidi (Aradi) the lamps were found in the in three Christian basilicas from the 5th to seven 7th centuries CE; in Nabeul (Neapolis), a fish salting factory gives a continuous stratigraphy from the 1st to 7th centuries CE in the lamp evidence. Finally, in Rougga (Bararus) the lamps from the reoccupation of the forum correspond to levels of the 7th - 8th centuries CE. The contextual analyses of the above sites mentioned allows the author classify the lamps under investigation into three main categories: African lamps with round and heart-shaped nozzles (Deneauve VII; Deneauve VIII)[69], Late African lamps (derived from types Deneauve VII, Deneuve VIII, Deneuve XI B [= Rossiter group 6]), and Late lamps in African sigillata (Types Hayes II A, Hayes II B [african sigillata groups C and D]).

[69] Bussière DII 1; Salomonson f 1-2, f 3; Ennabli 11-1 and 2, 3.

The paste associated with groups from the gulf of Hammamet are characterized by a clay matrix with limestone, rich in iron, red to yellow macroscopically, a “grainy" matrix with silty inclusions in low percentages (quartz and fossils) and a degreasing formed by quartz grains associated with limestone microfossils and limestone fragments with micritic subordinates. The paste also can be distinguished by the clay matrix which is rich in oxidized iron, with a macroscopic red colour, poor fine inclusions and a degreaser formed by quartz grains, often rounded and well sorted, associated with many fossils, including ostracods, and the absence of limestone (Capelli and Bonifay 2014: 240).

Indeed there are too many types of African lamps to account for the details of each form here, and sometimes the excessive typological classifications do not much help us to distinguish workshop productions, and in many cases the same workshop could have manufactured a wide range of designs with the aim of reaching many markets with their products. The round and heart-shaped nozzle (Deneauve VII and VIII) are the two basic types produced by African workshops during the 2nd and 3nd centuries CE. The criteria for distinguishing between the two subtypes are a deep incision style on the disc (Deneauve VII) and a narrower nozzle (Deneauve VIII). At the necropolis of *Pupput* these were the two main types of oil lamps found. Decorated discs on round nozzle lamps are more frequent with the "deep incision” and often have crosses, kantharos, korybante au tympanum, Africa goddesses or a man carrying an amphora. On the other hand, the decoration of the disk on heart-shaped nozzle oil lamps never has a deep incision and decorations on the disc are usually rosettes or two palms framing the filling hole. Bonifay (2005: 32) noted also that the paste seems to be of a lower quality.

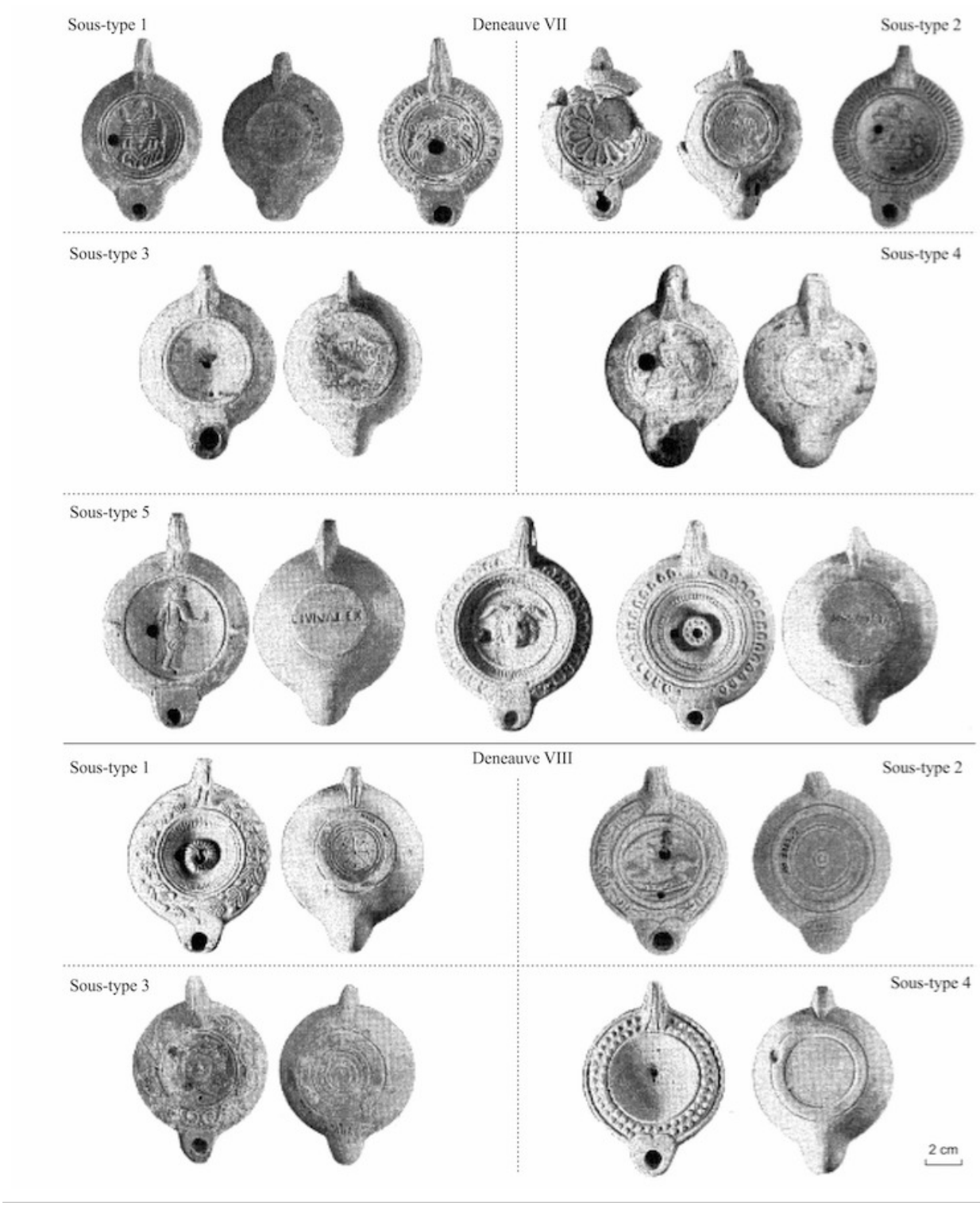


Fig. 78. Clay lamps from North Africa.

Other types[70] of oil lamps can be associated with funerary furniture in *Pupput* and the following trade marks are related to manufacturers: *CIVNDRAC*, *CIVNALEX*, *AVFFRON* or *FRONI*, *MNOVIVSTI*, *PVLLAENORVM*, *LVCCEI*, *PVLLAENI* and *MAVRICI*. These incised marks

[70] Bussière D VI, D III/D, V/D X1, D X4a D X4b, D X5, D X6; Salomonson g 1, g 2, Ennabli 12- 1, 2, 3 and 4 series.

also seem to correspond to two different geographical areas. Signatures such as *CIVNDRAC*, *CIVNALEX*, *AVFFRON* or *FRONI*, and *MNOVIVST* could be from workshops from Africa Proconsularis and Byzacene dated from first half and middle-2nd century CE; and *LVCCEI*, *PVLLAENI* and *MAVRICI* from ateliers from African Proconsularis from the end-2nd to 3rd century CE. Copies from the northern Gulf of Hammamet from 2nd-3rd centuries CE differ from those in other parts of Africa, and there are few local productions in Algeria, Byzacena and Tripolitania. However, there are a number of copies from the Severian period (Deneauve X) with well known variants (Deneauve 1986: 141-161). The types Deneuve VII and VIII continue to be made throughout the 4th century CE but the quality is much lower and there is no slip, no incised decoration, and the trade marks gradually disappear.

The late African lamp tradition is composed of forms derived from Deneauve type VII with variants (Bonifay 2005:33-34), found in contexts of the end-4th to early-5th century CE in Carthage Oudhna and Thuburbo Majus. Lamps derived from type Deneuve VIII sometimes resemble Firmalampen and are distinguished by a more elongated shape. These lamps are dated to the late-5th or early-6th century CE.

Finally, Late lamps in African sigillata (type Atlante X) are associated with African sigillata C of central Tunisia (Hayes Type IIA) and the African sigillata D from northern Tunisia (type II B Hayes). The well known conventional (groups C2 and C3) products from central Tunisia are dated from the 5th to early-6th centuries CE and their manufacture is attested at a workshop operating in Sidi Marzouk Tounsi. Contexts from Sidi Jdidi and Marseille show variants of these mentioned types with a range of decorations on the disc, which go from mythological to biblical and Christian scenes (e.g. Adam and Eve, Abraham's sacrifice, the watchman of the vine, Achilles and Hector, Characters, animals, plants, vases, decorations, geometric). The most evident Christians signs on those lamps are of two kinds: chrismated and monogrammatique crosses. The examination of lamps from Rougga also shows that the production of lamps in Byzacena was not limited to 5th-6th centuries CE, and this production was still going during the 6th to 7th centuries CE with little change to the types.

The northern Tunisian (Group D) products can also be distinguished from several other groups in the region. Within this group, busts are frequently represented on the disc, but the most common decorations are rosettes and geometric patterns. This group can be found in Carthage, in contexts of the second half of the 5th and early 6th century CE. Part of the production from northern

Tunisia copies central Tunisian models. A variant of this group (D3) is well documented for the lamps produced in El Mahrine (Mackensen 1993. Fig 31). Thus, northern Tunisian productions, affiliated to African sigillata D, with their variations, show similarities with the workshop of Oudhna (group D2) and the Mejerda Valley (group D3).

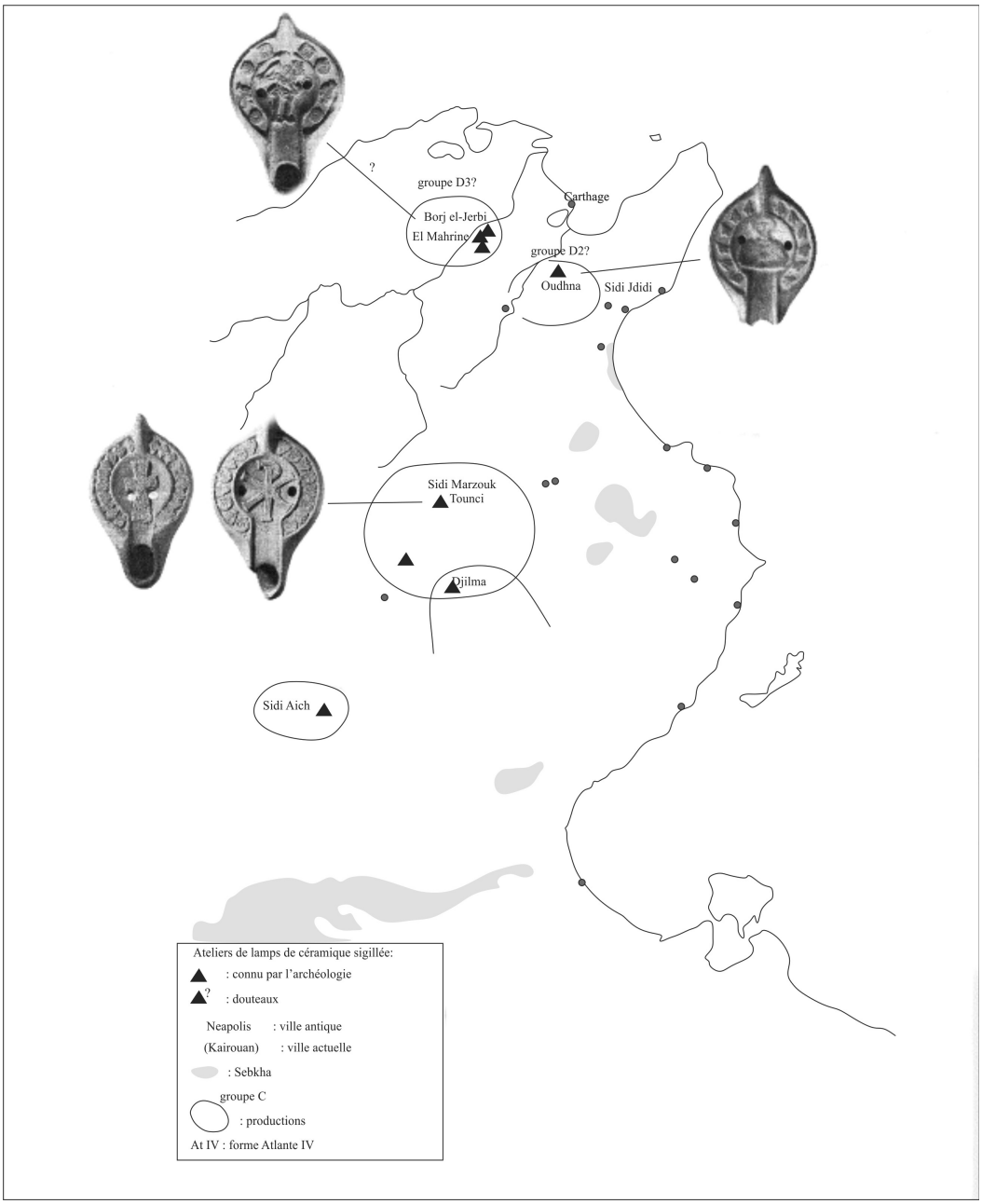


Fig. 79. Producing centers of lamps with Christian iconography in North Africa.

The substantial evidence about coastal Tunisian production is mainly for Carthage, but also the region of Clupea/Kelibia, Neapolis/ Nabeul, Pupput, Sidi Jdidi, Leptiminus, Bararus/Rougga,

and Jerba. Basically coastal contexts are rare in Algeria, and include the sites of Caesarea/ Cherchell, the villa of Nador, Tipasa, Driaria el-Achour, Rusguniae, Hippo Regius/Annaba, and rescue excavations in Icosium/Algiers. The available information from Libya springs from Sabratha and Leptis Magna WHAT ABOUT LIBYAN VALLEYS, FAZZAN, GHIRZA, SIDI KHREBISH….ALL PUBLISHED, SEE SOCIETY FOR LIBYAN STUDIES WEBSITE PUBLICATIONS. A series of urban sites are documented for inland regions of North Africa: Setif, Tibessa, Maktar, Ucchi Maius, Althiburos, Hadra andLambaesis YOU SHOULD SEPARATE THESE INTO COUNTRIES EG LAMBAESIS IS ALGERIA. These evidences are completed by several surveys carried out both in coastal and inland regions. In Tunisia around the areas of Dougga, Segermes and Passerine; in Algeria around Diana, Cherchell and Veteranorum/Zana; and in Libya in central Tripolitania (Bonifay 2013: 530-531).

Non-african lamps are rare[71] and mostly belong to Late Byzantine period (7th century CE) and were found on the coastline, so the distribution of fine wares cannot be compared with the distribution of imported lamps. Continental versus coastal patterns of consumption provide interesting statistics about consumer goods in the interior versus those from the coast. The supply of lamps, tableware and amphorae into inland regions was not insignificant, although African fine wares did reach regions more than 450km away (e.g. workshop production from Sidi Marzouk Tounis to Setif). Central Tunisian oil lamps were imported on a large scale until the end-5th to early-6th centuries CE (Bonifay 2013: 554), and regional and local ceramic products are present at major settlements and towns located along the main roman roads.

Patterns of pottery consumption in the interior and those in coastal regions are very different. In fact, cities close to the coastline demonstrate very local patterns of supply (e.g. Aradi/ Sidi Jdidi), while major inland towns received diverse Mediterranean imports (e.g. Thysdrus/El Jem) especially during 4th century CE. Evidence points out that workshops from Carthage supplied 'classical' ARS wares (sigillata D) and eastern Mediterranean Late Roman amphorae through the ports of the Mejerda valley to remote farms and towns such as Uchi Maius and Aïn Wassel, near Dougga. Despite their distance from the coastline, the pre-desert region between Leptis Magna and the Tripolitania limes were apparently open to Mediterranean imports, as attested by the supply of pottery at the Gheriat el-Garbia fort, around 250 km from the sea (Bonifay 2013:552).

[71] Exception of two Sicilian exemplars found as far as Timgad. (Bussiére (2007) C1990–91) Annaba: Bussiére (2007) C1985–89 (Sicilian)

The evidence at hand suggests that later types (Atlante VIII C1d, VIII D and X group D3) of northern Tunisian lamps can be found on coastal sites, such as Hippo Regius or Tipasa, and Leptis Magna (Bonifay 2013: 548; Bussiére 2007: ??; Joly et al 1992: fig. 96 and 99)[72], along with eastern Mediterranean lamps[73]. Apparently the majority of oil lamps from Algeria are from central Tunisian workshops (type Atlante X, group C2–4), mainly those found in inland sites (e.g. Djemila, Setif, Lambaesis, Timgad, and T.bessa). The major port cities, such as Annaba and Cherchell (Bonifay 2013: 548), and the southern Tunisian workshop operating in Sidi Aïch also traded their products to inland sites[74].

In this sense, local production inspired by Roman style traditions was not restricted to inland sites, and can be attested along a very narrow band of the African coastline. Although a considerable number of clay moulds influenced by central Tunisian ARS lamps have been found in Tiddis (Bussiére 2007: ?, 129-132)[75], Djemila and Timgad in non-slipped fabrics, sites such as Tipasa and Hippo Regius have local productions with very distinctive characteristics during 4th to 5th centuries CE (e.g. Atlante VIII and inscribed rims '*de officina assenis*')[76]. In the same period Tripolitania has its own production of lamps as does the region of Carthage, and the northern Gulf of Hammamet, all traded along the African coastline.

In short, African local markets were strong inland (small towns had local productions and markets) and coast regions used Roman trade of wine, oil, fish products and tablewares to capitalize on their strategic position connecting to the Mediterranean basin as well as to hinterland regions. Thus, regional inter-provincial (later on 'intra-diocesan') trade existed and points to significant internal exchange (Bonifay 2013:557; Wickham 2005: 720–728). The hinterland regions received not only lamps and tablewares from central and southern Byzacena, but also wine and garum that arrived from the Mediterranean coast, on a large scale, at least until the 3rd century CE. The east-

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[72] Hippo Regius/Annaba: Bussière (2007) C210–20 (Atlante VIII C1d); C225 (Atlante VIII D1 from Oudhna), C237, 239, 240 (Atlante VIII D1 from El Mahrine), C247 (Atlante VIII D2), C250 (Atlante VIII D3), C253, 256, 258 (Atlante VIII D4), C260, 262, 266 (Atlante VIII D5), C267 (Atlante VIII D6); C587, 653, 1168 (Atlante X, group D3). Tipasa : Bussière (2007) C236 (Atlante VIII D1); C615, 640, 1020 (Atlante X, group D3), C606 (Atlante X late). Leptis Magna: Joly, Garraffo and Mandruzzato (1992) figs. 96 and 99 (Atlante X, group D3).

[73] Coastline: Annaba: Bussière (2007) C1985–89 (Sicilian), C1996 (Black Sea). Carthage: Hayes (1976) 121–22 and pls. 27.G9–13; Hayes (1978) 92 and pl. 8, nos. XXI.27, XXIV.51, G46 (Sicilian). Timgad: Bussière (2007) C1990–91.

[74] Bussiére (2007) C18 (Timgad) and C33 (T.bessa): comparisons in Nasr (2005).

[75] Bussière, J. 2007, Lampes antiques d'Algérie, vol.2: Lampes tardives et lampes chrétiennes (Monographies Instrumentum 35) (Montagnac 2007).

[76] Tipasa: Bussiére (2007) 52–53. Inscribed rims: Bussiére (2000) pls. 122–23.

west road network with the mountain chains that divide the landscape in latitudinal bands, and non-navigable rivers, certainly enabled the development of such relations of trade and exchange in the particular geography of the Maghreb during the Roman and late antique period. There is no doubt that transport by sea, mainly from Zeugitana and Byzacena (eastwards and westwards) favoured the growing demand and supply of African pottery, and lamps were much-needed products that were produced at low cost and catered for the tastes of the client, and thus were part of cultural networks and relationships of exchange..

African Red slip ware was often produced inland, in or near oil production regions, rather than on the coast, where the manufacture of cooking pottery and amphorae more commonly took place. Oudhana and Sidi Khalif are well know hinterland sites with the presence of kilns at least 30-45km inland, and the sites of El Mahrine and Sidi Marzouk Tounsi, some 100km inland, strongly support evidence for high scale pottery production near to accessible oil waste for use as fuel. On the coast, the sites of Carthage and Lepitiminus (and maybe Sabbatha and Leptis Magna) show evidence that fulfill the conditions for firing large quantities of fine wares, as well as the specialized man power to control the techniques and to be part of exclusive markets for pottery including lamps. Thus, ARS was mainly located in hinterland sites where alongside oil production, and both were carried to the coast together, the oil primary in skins, presumably to reduce the weight to facilitate transport, and the oil was then transferred to amphorae manufactured near the ports (Lewit 2011: 320).

The hinterland landscape, operating as a zone for the development of intensive agricultural production of oil, grain and wine, and the North African littoral, as an import/export zone, would have increased primary production and encouraged secondary production. These key economic factors, seem to be operating at Berenice/Benghazi in Libya, Kasserine-Cillium and Sitifis in Tunisia, Cherchel in Algeria, and it is likely that this system was well developed before the Roman Imperial period in North Africa and provided conditions for import replacement (Heslin 2008) Import replacement is not necessary for the continued functioning of a region's economy, rather it occurs when a province or region begins to produce a capital or consumer good that it had previously imported and when autonomous production of imported goods and local demand are satisfied by local resources; mainly through the land, labour and capital, employed in the production of those goods.

Other drivers and symptoms of import replacement include urbanization, division of labour and mass-production, alongside technological change on process and at the collective (group) knowledge for accumulation of human capital. In this sense, for the production of clay lamps (and pottery, in general) the quality of the labour force is as much a factor as the quantity. The increase and/or new employment of under-used local resources implies a great Gross Domestic Product (GDP), which generates, at least in the short term, greater productivity per capita and implies exploitation of any economies of scale. It is not by coincidence that during 5th-7th CE Palestine, hundreds of new villages were established and production of wine and oil expanded, as is shown by large numbers of presses, the adoption of new, more intensive press technology, and the wide distribution of amphorae (e.g Palestinian) around both the Eastern and Western Mediterranean and the personalized demand for oil lamps.

In around 350 CE, the Mediterranean market was dominated by African ceramics (Hayes 1992: 463, map 26; Panella 1973; Manacorda 1977). The commercialization of olive oil, salsamenta (which includes both garum and solid salt-fish) and wine seems to have been linked TO pottery production. Amphora cargos were sometimes supplemented with cooking and domestic wares, and from the 5th century CE the wide distribution of amphorae of pre roman tradition were attested at Sitifensis, at coastal Byzacena and in the northern part of the Gulf of Hammamet (Bonifay 2007). An identical continuity can be observed in Eastern Mediterranean regions with a Phoenician tradition, after Greco-Roman LR amphora 1 in Cilicia had ceased, the production of the Gaza LR amphora 4 and bag-shaped LR amphora 5-6 continued in the Levant into the Islamic period (Bonifay 2007:145).

North Africa has shown evidence for figurines re-cycled by the new Religion, namely Christianity. A great number of clay figurines, many depicting a mother-goddess seated in a wicker armchair, breast-feeding a child, which stemmed from Punic tradition, were found in Carthage in connection with the goddess Tanit, of which the most famous example, nearly life-sized, comes from the Thinissut sanctuary. Similar objets were produced in the 6th CE ARS workshop of Oudhna in the same fabric as ARS lamps; the moulds, like those of lamps, were made in plaster (Bonifay 2004b, fig. 43).

The continuity in themes, sometimes even in the way they were incorporated inTO the decorative patterns, becomes obvious by comparing figures OF goddesses and of gods (on appliqué decoration of the 3rd CE) with the figures of standing saints (or Christ) on stamped decoration of

the 6th century. Potters imitated other wares (e.g. Hayes' forms 82-85, 90-105), and the same iconography in tiles with relief decoration were used for the decoration of Christian basilicas, especially in regard to the relationship with the mother-goddesses, but more credibly could be interpreted as representations of the Virgin. Two examples, one from the region of Bou Ficha, and a similar one from Nabeul, both show two women, each with a child on their knees, sitting side-by-side on two thrones and the tile sizes used Punic units of measurement. North Africa actually become Roman only during the 2nd CE as far as ceramics are concerned. At the end of Antiquity, the Roman tradition was to some extent more vibrant in Africa than in many other Mediterranean regions, and the best-known ARS workshops are from el Mahine, Oudhna, and Sidi Marzouk Tounsi. All these workshops are from late antiquity and a comparative perspective suggests the most common shapes did not change from the 4th to the 7th CE.

Roman tradition at the end of Antiquity was to some extent more vibrant in North Africa than in many other Mediterranean regions. The 5th to 7th centuries CE were the apogee of ARS lamp manufacture, recalling earlier Imperial types. Import replacement suggests the production techniques, involving plaster moulds, were the same; although decorations concerning gods and goddess were to some extent replaced by crosses, with animals remaining the preferred representation (Bonifay 2007: 147-50).

Still produced during the 4th and 5th centuries, but without slip or handle-holes, and mostly without signature marks, heart-shape noose lamps, which had been the most common 2nd-3rd CE types, were actively being marketed in North Africa. Eastern Mediterranean influences can be attested by the so-called "vandal" wheel-thrown Lamps in Byzantine layers. It seems that the majority of lamps discovered at Carthage derived from Byzantine levels (Bonifay 2004b: 429), aphenomenon clearly apparent in the stratigraphy of Carthage for mould-made lamps of the 5th CE, and indeed, some late antique lamp shapes remained in use until the beginning of the 6th century CE. As far as research goes, an important workshop producing a 6th-7th CE common variant was identified at Oudhna (Barraud et al 1998: 154, fig. 13, n. 14-15), although more production units are waiting to be discovered.

It has been suggested that African lamps derived from a range of wheel-turned lamps, which spread widely throughout the Syro-Palestine region from the 3rd CE (Orssaud and Sodini 1997: 63-64). It seems quite reasonable to assume that theses lamps were accessible through the network interflow between the coastal area of North Africa (Carthage) and the coastal area of Phoenicia

(Tyre). Indeed, except for the old Punic examples, no indigenous predecessor has been discovered for the lamps found at North Africa.

Omnipresent at all ARS workshops recognized in Tunisia (e.g. El Mahrine, Sidi Marzouk Tounsi, Henchir es-Srira, Hencir el-Gellal Djilma, and Oudhna), the Red Slip tradition in African pottery production can be identified through the remains of firing tools called saggars. The saggars were cylindrical clay boxes, wide-mouthed at one end, narrower at the other, into which the pottery to be fired must have been placed. Comparison with techniques used in modern faience workshops suggests that saggars were stacked on top of each other, forming towers inside the kiln. The only ARS kiln so far excavated in Oudhna indicates that inside a sagger there was room for some 12 lamps, and that approximately 180 saguaros could be set inside an oven, giving a total firing load of more than 2000 pots.

Fig. 80. Saggars from Gladstone Pottery Museum[77]

African potters used moulds made of plaster, unlike the majority of Western Mediterranean workshops, which used clay moulds to produce lamps. Plaster moulds were adopted both by Early

[77] Gladstone Pottery Museum: https://commons.wikimedia.org/w/index.php?curid=5896895

and Late Roman workshops for most ARS lamps of the 5th and 6th centuries CE (Hayes'type I and II). From the second half of the 6th century the sophisticated manufacturing process of these lamps, which comprised the modeling of a plain clay archetype and its decoration with appliqué to be used to produce the definitive plaster moulds, was progressively abandoned (Mackensen 1993: 101-105). At the end of the 7th CE, a new decorative style with linear and rather naive patterns appeared, and Hayes' type II lamps show evidence for blurred decoration, most probably caused by continuous use of old moulds (Bonifay 2004b, fig. 231).

Motifs seem to have been hand-designed directly in the mould, which implies that the moulds were no longer plaster but ceramic (Bonifay 2004b: 81). One example was unearthed in Rougga (Bararus), together with sherds of coarse ware and Hayes' type II lamps. Perhaps this change was not only due to technological impoverishment, but also the influence of other Mediterranean industries, such as the Syro-Palestinian and Sicilian lamp making industries (Bonifay 2007: 152).

Ceramic production in Africa has a clear geographic setting in Late Antiquity. Northern and central Tunisia contain the ARS workshops from the 1st to the 7th CE. It seems that until the end of the 2nd CE, the most active kilns were situated in northern Africa Proconsularis, perhaps in the vicinity of Carthage (Oudhna, Bonifay 2004a: 47-8). In the 3rd-4th CE, a new wave of production took over, originating in central Byzacena and in particular El Mahrine regained its importance and exported throughout the Mediterranean. During the 5th CE ARS from the Vandal period was produced by units in central Byzacena (Sidi Marzouk Tounsi), after which those of the Carthage region recovered their hegemony in production and trade aroundthe middle of the 5th CE.

The introduction of the pottery industry to the city centre is a well-known Byzantine phenomenon. During the course of the 3rd and 4th CE the ARS industry seems to have been tightly connected with large rural estates but ARS workshops linked to cities is currently considered to be a later development alongside amphorae and coarse ware production. The end of the 5th or the beginning of the 6th century, prior to the Byzantine re-conquest, seems to have marked a return to an earlier situation, and northern workshops prosper once again. The most important workshops of the period were no longer situated in Mejerda (El Mahrine), but in the Oued Miliane valley (Oudhna), as shown by Carthage excavations. Workshops around the city of Carthage were apparently the last ones to produce and export ARS, up until the end of the 7th or the beginning of the 8th CE. The movement of production to central Byzacena in the second half of the 5th CE might

also be linked to altered political circumstances and Christian religious persecution under the new ruling class in the Vandal territory (northern Tunisia).

Jews in North Africa are traditionally compiled according to scholars' assumptions about the immediate identifiability of Jewish materials, frequently informed by ancient Christian and rabbinic literary polemic. Collections of artefacts for such as moulded lamps, decorated with menorah, are particularly associated with Jews in North Africa (Lund 1995; Barbera and Petriaggi 1993: 63, 88, 284, 285). It suggests (Stern 2007: 305-309) that Jews exhibited ranges of practices in North Africa that exceed the scholarly assertions, "orthodox" Christian taxonomies and foreign rabbinic Jewish.

Fig. 81. Lamps with Jewish iconography in North Africa

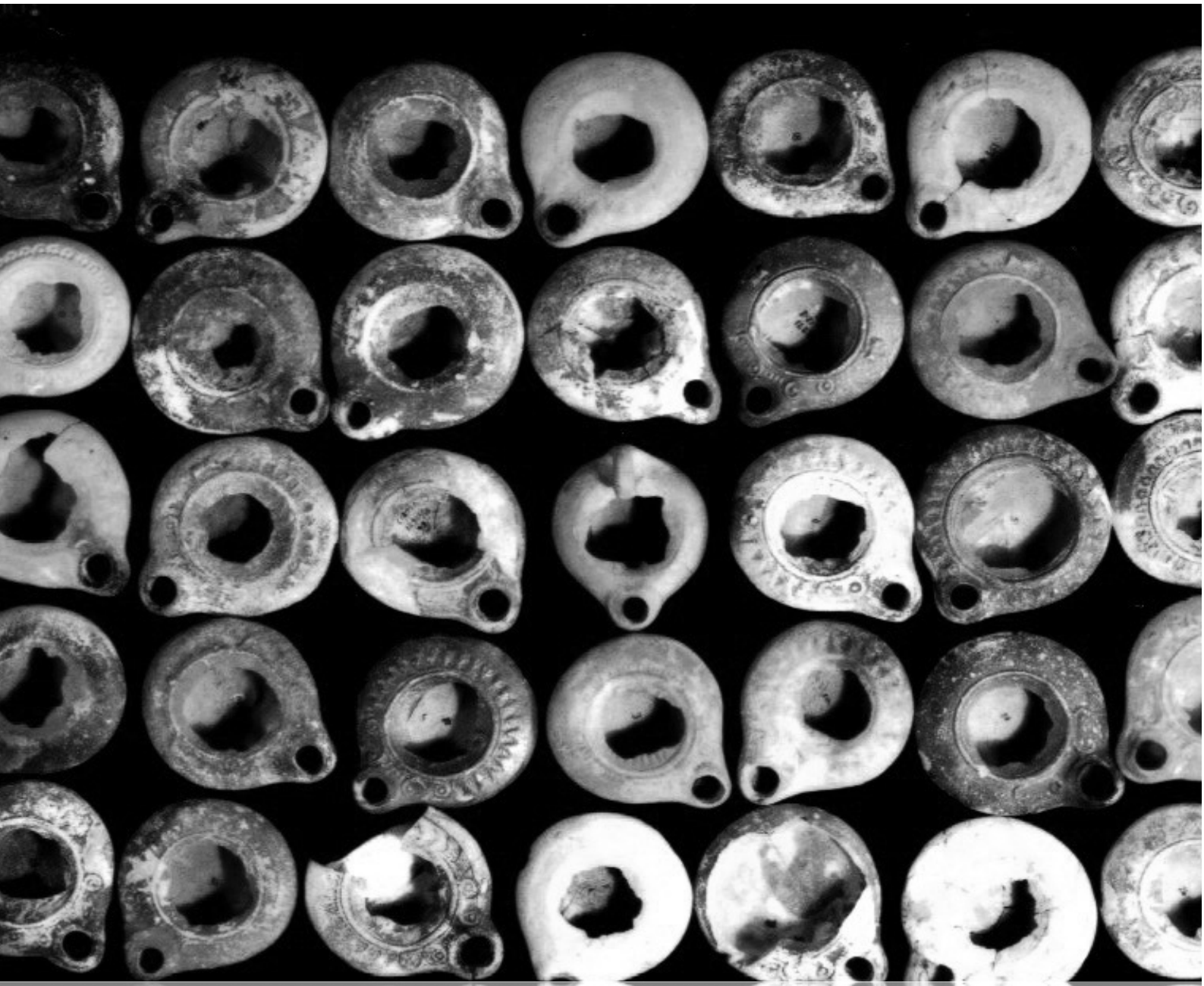
(Barbera and Petriaggi 1993: 63, 88)

The Jewish presence in Carthage and elsewhere is corroborated by inscriptions that contain in particularl Jewish names and adjectives (*Iudaeus*), and Jewish symbols that have enabled scholars to identify as "Jewish" clusters of burials at Gammarth and Oea, and isolated funerary *stelai* throughout Africa Proconsularis, the Mauretanias and Tripolitania. Funerary tiles, bowls, and lamps, which depict biblical scenes and figures such as Jonah, Adam and Eve, do suggest distinctly indeterminate qualities that rarely explicitly mark words or symbols as either Christian or Jewish.

North African populations and of Jews had differing circumstances of adaptation into North Africa's regional and transregional cultures (see, Hull 2009).

Stern (2007: 306) suggests that 'ancient works of figurative biblical art that possess no explicitly "Jewish" markers should necessarily be labeled as "Christian"?10 Can words used in an epitaph simultaneously emulate Christian and Jewish notions about an afterlife? Must a symbol be either a menorah or a cross, or can it be both?' Jews from Roman North Africa lived in deeply complex cultural environments and their material evidence reflects this aspect. As happens in Palestine Jews gave their children locally popular names, used vernacular Latin to commemorate their deceased and constructed their cemeteries according to local North African custom. Thus, in many cases, North African Jews marked themselves in ways similar to their neighbours. The lamps and the remainder of the archaeological corpus raise possibilities that North African Jewish identities were desirably complex, and varied among those who commissioned artefacts with a range of cultural identifications, and acceptable to one-to-one relationship between those belong the group's artefact complexity and human complexity.

COMPARATIVE PERSPECTIVE



12. Colonialism and Propaganda: the question of appeal and market.

The concept of Roman rule in local terms, the process of so-called Romanization, a diverse and largely positive reflection of the impact of Romans power, flourished at the turn of twentieth century, at the same time that modern colonial empires were being formed (Dmitriev 2009: 124-125). The end of the colonial era and the new interdependencies of contemporary societies opened up fresh avenues for understanding the importance of 'peripheries'. Early theories related imperialism closely to capitalism[78], presenting imperial power as a war machine in pursuit of unlimited and unreasonable territorial expansion, emphasizing the formal structures of direct control and stressing the economic character of the imperial process (Erskine 2010).

Against the centrist perspectives, a modern progressive response to the old-fashioned and inadequate idea of ancient imperialism can be found in 'post-colonial theory' which focuses on the interaction between the Romans and the locals as having had an impact on both sides. So-called 'frontier studies' conceptualize frontiers as places of interaction rather than separation. Beyond the military role, this school of thought highlights the importance of the social meaning of the frontiers (Fabricius 2009; Guarinello 2010).

The formative period of Roman provincial cultures should be viewed as part of a broader transformation process within the Roman empire that took place mainly around the turn of the millennium, after Roman Republican imperialism which was characterized by little cultural change (Woolf 1995, 1997). The institutions (roman law, magistracies and taxation, patronage, patrimonialism, itinerant monarchy and the imperial cult, the citizenship and procuratorial service), were pervasive throughout the provinces at the same period in which Roman style buildings appeared in the west and the east, and epigraphy and terra sigillata became widespread throughout the Mediterranean.

The combination of art, politics and propaganda, through which Augustus, the first emperor, established the image of a new political system, were an invention of empire (Elsner 1996: 35-36). The expansion of imperial infrastructures encompassed a wide range of activities and served to

[78] J. A. Hobson, J.A. 1902, Imperialism: A Study; Lenin, V.I. 1917, Imperialism, the Highest Stage of Capitalism; Schumpeter, J. 1919, The Sociology of Imperialisms.

control societies, reinforce roman power and create new relationships of dominance and dependence. Although Rome had an empire even before it had an emperor, this assumption deserves to be explained here. More than a territorial idea of empire, which Romans probably took a long time to develop, the presupposition of what an empire should be was related essentially to people rather than places (Erskine 2010: 4-17). Therefore, rather than only territory, empire was a way of thinking in relation to power over the people, which had consequences on civic (group) identity and inter-state relations.

As well observed by Woolf (1995: ??), many challenges and opportunities were created for provincial societies located at the new interfaces between the extension of imperial power and the local provincial communities. Beyond the balance between war and peace with surrounding societies, and the maintenance of security, the dealings between Rome and its provinces relied upon mediating material culture and manipulating it with maximum leverage. Consequently, around the turn of the millennium, major disruptions and new possibilities within the structures of Roman imperialism and provincial societies culminated in what has been termed the Roman Cultural Revolution (Woolf 1995; Wallace-Hadrill 2008).

Republican imperialism had so far helped the senate and popular assemblies as institutions of Roman power to spread around the Mediterranean; however during the first century BCE a series of civil wars led to the emergence of a monarchy, ruled by the emperor, which began with the emperor Augustus. In the period from Augustus onwards, Rome's domination was imposed over other states with narrower political meanings. The emergence of new forms and elements of cultural changes appeared within this process, mainly because peripheral powers had been enlarged into power vacuums created by Rome after a number of areas suddenly went into revolt. This occurred in Palestine, and it is not by coincidence that Roman hegemonic conquest operated, through territorial expansion, as a tributary state. Managing territories as tributary states was a consequence of administrative problems and relationships of power.

New styles of Italian buildings spread throughout local societies as items appropriated or developed by provincial elites in the formative period of colonization. Characteristic patterns of social space, monumental complements and associated customs, as well as social structures and ideologies, were all affected by the cultural blends of provincial cultures, which actively participated in empire-wide changes and contributed to the growth and subsequent decline of the classical city (e.g. Leone 2013).

In this sense, material cultural was used to renew and transform previous structures through the extension of the provinces. Goods were chosen for their potency as symbols, but not without being affected by local styles and tastes, as the sigillata phenomenon (tablewares and lamps) demonstrates. Obviously the Roman empire had neither the desire nor the ability to impose terra sigillata on its subjects, this happened within a process of acquiring new cultural aspirations and new materials, and the capacity to realize them. In areas where terra sigillata could not be made nor cheaply obtained, imitations wares were produced, setting the emergence of new sales and new uses of material culture in relation to structural changes within the empire (Woolf 1995: ???).

Taking an integrated approach to the study of Roman disc lamps through a regional archaeological perspective provides a unique panorama for both Palestine and North Africa, which were considered, at different moments in the process of Roman colonization, as peripheral landscapes. In addition to the evolution of the ways of making things, which provides the chronology of those artefacts, the agency of clay lamps combine the unique character of memes[79] in society. The imagery on clay lamps is closely allied to the styles and shapes of the objects, which were imitated in multiples places. The visual representation that was linked to cultural influences was not only a sort of propaganda for Roman imperialism; but was also a response to local and regional demands for certain patterns of behavior and ideas. Lamps, which often bore images were a crucial framing device for the spread of ideas, playing a key role in the competitive arena for the multiple meanings within Roman society. It is important to note that territory is a cultural construction that involves the symbolization of objects and landscape.

In Roman society, as happens in any society, shared understandings and shared conventions circumscribed the meanings of things and shaped regimes of value. The main media of the Roman koiné were coins, statuary, painted walls, mosaic floors, clays figurines and clay lamps. Unfortunately the study of clay figurines has not been carried out using a multi-disciplinary perspective so this media remains poorly understood. Social structures and meanings connected to culture identity were driven by religious and symbolic motivations and clay lamps can demonstrate the significance of material culture and how individuals used material culture creatively. Within this framework, the idea of identity has both content and location, integrating both concepts and beliefs that a group collectively hold about their own identity formation.

[79] See chap. 8, p. 84.

Imperialism often defies easy categorization and the Roman empire arose from very different conditions to empires from modern times. Rome employed a variety of strategies for exercising power over other states, first in Italy and then throughout the Mediterranean. What is important to note is that imperial powers have in common 'a willingness and capacity to change the world they encounter to work in their own interests' (Erskine 2010: 5). Thus the territorial control of Rome encompassed the capacity to shape the world to suit itself which made it an effective empire also through the control of peoples' interests.

In so far as the provinces became part of this imperial system, a system structured upon tdifferences, provincials opposed some elements, challenged the imposed identities and sometimes usurped. The relationship to others is expressed in terms of ideas about the shape of culture itself and particular customs and styles that may define and describe a group. Effectively, style is a matter of art-historical discourse, a rhetorical tool whereby the visual practices of periods of the past or the different works of particular individuals may be defined (Elsner 2003: 6). Both the location and content of a group's identity may express a cultural map of the cosmos on which a groups' own location is marked. Those key symbols, concepts, practices and institutions are central areas of culture and the sites of fiercest cultural conflict, exactly because they hold the terms of what is spoken and the controversial opposition to what is left unsaid (Woolf 1995: 14).

The potency of images in the Roman world carry some aspects of a person's presence into posterity, making them a prime object for memory sanctions. By the Late Republic many conflicts between different aristocrats and factions in Rome were conducted through the creation, veneration and destruction of images, including penalties such as denying a postmortem memory to enemies of the state (Elster 2012: 370-377). A discourse of image destruction and memory erasure arose just after Augustus by the time of the Principate. During Late antiquity Jewish and Christian positions differ from Roman polytheist religion[80], particularly Christian attitudes to idolatry, which shaped Byzantine iconoclasm. The second "image war" is considered an internal development from Eastern Christianity, a period when the image as object-to-think was a powerful discursive and polemical weapon without any precedent in Western tradition.

I and Tal (2015; 2016??) strongly argued that the intentional breaking of Roman figurative disc lamps in circulation during 2nd-3rd CE that reach the 4th CE was an act shared by the three monotheistic religions of Roman Palestine (Jews, Samaritans and early Christians) as a desired

[80] so-called pagan just up to 5th CE as a reference of non-urban and superstition religious

victory of monotheistic faiths over polytheistic counterparts. In other words, a redistribution of symbolic power in which meaning and power over the traditional registers, symbols and practices were challenged with the aim to change the relationships of tradition, hegemony and power and their relative habitus in society.

The act of iconoclasm has to be accompanied by the need to record its effect, and the contradictory aspect of this act of forgetting is that it works through the remembering. In this sense, remembering acts of iconoclasm reinforce the iconophobia. In the case of Palestine, this has been demonstrated by a high number of broken disc lamps within funerary contexts (RFER.). In this sense, when we think about communication or changes between parties in society, it is necessary to note that sharing a common understanding about the rules by which they are acting, even when parties are playing against one another, is a significant subject. Remembering an act of iconoclasm is an integral part of the exchange by which religious groups of Palestine engaged in the discourse of symbolic power and its redistribution in the region. From the moment of Christian hegemonic ascendancy (4th-5th c. CE) both literary and archaeological records points to wider christian destruction of sanctuaries and idols in the Greco-Roman environment. The modern consensus about the traditional view that understands the early church as hostile to the visual arts has been challenged by the proposistino that early Christian apologists were primarily directed against pagan polytheist practices, rather than the christian cultivation of religious images (Elster 2012: ???).

Since Roman religion is more open-ended theologically, perhaps largely because little was written down, Jewish, Samaritan and Christian positions differ from polytheist ones in terms of the importance of the image and prototypes transferred from one to the other. The development of Byzantine iconoclasm followed by the Christianization of spaces breaks the link between image and prototype in Antiquity since far from damaging the prototype, the destruction of images (and other traditional roman representative symbols, such as sanctuaries), was itself a form of honour and victory over the counterparts. The prototype would be damaged through damaging the image and reinforce the discourse of iconoclasm with the aim of guaranteeing an appropriate way of honouring and accessing the divine. Therefore an assault on the image itself and by consequence on the prototype was the main issue and the status of the icon in its own right as a means of mediation in the wider sacred economy, giving shape to discussions about idolatry by the second Iconoclastic era, which focused on the questions of ritual.

As demonstrated by Eric Lapp (2006: 371-377), economic concerns related to religious symbols govern the marketing and distribution of oil lamps that have a menorah or crosses as a design. The lamp makers and workshops sought to attract religiously divers buyers, although within this process they targeted particular groups. The emergent marketing of clay oil lamps with religious monotheistic symbols doesn't mean that the producers were Jewish or Christian, or Samaritan, but that the clientele intending to buy those objects were affiliated with one those groups or two of them.

By the 4th CE a competitive lamp market catered for the transition from Roman to Byzantine Syria-Palestine. Regional workshops provided manufactured lamps to aesthetic and religious preferences of a culturally diverse clientele. Thus workshops were driven to diversify their products in design, decoration, and form in order to engage with a competitive and massive lamp market settled in the region.

Local Syro-Palestinian workshops were not just religiously inspired or focused on artistic self-expression, and instead it was economic reasons that influenced the types of iconography carved into lamp moulds that would best appeal to their clientele (Lapp 1997: 371 - VERIFICAR). The lamp maker in the workshop had a specific target market, a homogenous socio-religious group, when purchasing lamp moulds and choosing the iconography of the objects manufactured. Therefore, clay lamps serve both as instruments that reflect the religious differences and indicators of clientele in Syro-Palestian society in Late Antiquity. The deliberate exploration of motifs and/or inscriptions found on selected Syro-Palestinian lamps reflect a market for financial profit, which in turn, provided symbolic objects for the designated consumers. These artefacts helped to express individual identities within religious and social groups inside Roman society.

The diversity of symbols carved into lamp moulds began in the late-3rd century CE, after the establishment of the phenomenon of intentional breaking of clay lamps. Thus, it is not a coincidence that a proliferation of lamps depicting Jewish, Christian, and Samaritan motifs began roughly in the 4th century CE. Aside from its capacity to carry out its intended task of providing light, customers' aesthetic tastes, such as decoration, design, motifs, and slipping, and social-religious affiliations may also have played a pivotal role the sale of lamps. To appeal to one or more types of customer, workshops linked motifs and/or inscriptions in Greek, Hebrew, and Samaritan, in order to compete in all marketss. The evidence for inscriptions on clay lamps also include advertising that encourages the public to buy the product: sentences such as "Buy me" or "May it be

for his good who shall buy it” were carved into lamps (Walters 1905: 422). Inscriptions advertising lighting devices for votive purposes with exhortations such as “Take this for the gods” or “Take this as a thanks-of-fering for the gods” appear on lamps and are also evidence of the role that clay lamps played during the Roman to Byzantine period (Bailey 1988: 118, Q2783- Q2727). This kind of advertisement occurs mainly on the slipper-shaped Jerash lamps with a zoomorphic or tongue-shaped handle (Rosenthal and Sivan 1978:139, no. 574).

Fig. 82. Old City Jerusalem and the current trade of clay lamps.

In contrast to the Roman period, lamps of the Byzantine period (4th to 7th century CE) were mostly locally made, a phenomenon found mainly in large cities, many of them being produced at Caesarea and within its region or in the Beth Shean area. The most common lamps with monotheistic symbols belong to the Syro-Palestinian discus class, the Beit Nattif, Caesarea round, Slipper "candlestick", and Samaritan, all derived from the imperial roman discus lamps, especially during the 1st centur BCE to the 1st century CE. These classes of lamps are considered to be locally manufactured (Sussman 2012; Lapp 2001: 294) and were frequently decorated with Jewish and Samaritan menorahs, Torah shrine, Christian cross, Gospel aedicula and other monotheistic motives developed for dominating the market.. Inscriptions quoting Greek Christian liturgical passages (e.g.

found in Church of the Nativity), or Samaritan scriptures, became common either on Slipper or Samaritan lamps classes.

The heaviest concentrations of Beit Nattif lamps depicting either menorahs or crosses, in Beth Guvrin, Beit Nattif, and the surrounding areas, indicate a large Jewish and Christian lamp market in the Shephelah region. Beit Nattif lamps were decorated only with Jewish and Christian symbols, geometric and floral designs (Rosenthal and Sivan 1978: 105-10, nos. 423-47; Magness and Avni 1998: 97-98, fig. 5, 6; Sussman 1982:11; Hachlili 2001:442-48, L2.3-26, L3.1-5, Corpus pls. pp. 86*-88*, pls. II: 80-81; Lapp 1995: 66-70, 338, fig. 49). Naturally lamps with non-religious decoration (e.g. geometric and floral designs) achieved a wide market and appealed to many different types of customer. The geometric patterns attributed to a 'non-religious market' can also be found on Samaritan lamps, suggesting manufacture intended for an open market (Sussman 1983).

So Beit Nattif and Samaritan lamps were competing in an open market to appeal to members of any religious group, (e.g. Massey 1994: 17-86; 2009:102-176), who were trying to be the strongest religious monotheistic groups in landscape to establish and negotiate their traditions and habitus. Beit Nattif lamps were recovered from the Ahinoam Cave and Southern Cemetery at Beth Guvrin (Avni et al. 1987: 73, fig.1; Lapp 1997:420, fig. 150) and were alo found in the treasury of the synagogue at Hammath Tiberias in Lower Galilee (Lapp 1997: 202-3, 416, fig. 144). Although portraying crosses on the bow-shaped nozzle of some specimens, these lamps were explicitly manufactured to appeal to a Jewish clientele as they have been found in Jewish archaeological contexts. There is also a case of christian symbols being manufactured by Beit Nattif producers but this early christian identity is much more related to Jewish symbols and identities during the initial phase (jewish-christian was another type of Jewish identity within society), in which group identities were being organized, largely based upon Jewish relationships and networks. Consequently the formation of social groups was being shaped by who had the strongest monotheistic tradition. In this sense, early christians were in opposition and dispute over the pre-eminence of the burgeoning Jewish Diaspora tradition revived by Hasmoneans. A new movement about the meaning of national myths and symbols was brought to the cultural arena, which in turn, created new common denominators of the what would be the 'Jews of the time' (Tal 2009: 70-73).

Moulds of clay lamps were found in Caesareia Maritime in a deposit above the apse of 4th century CE building located south of the city wall (Sussman 1980: 76-79). The intended market for these products was the local people, attention to the production of Christian themes (e.g., the cross,

a Gospel aedicula, a fisherman, and a peacock), but with appeal also to the Jewish communities (e.g. menorah flanked by a lulav - palm frond - in the residential quarter at Sepphoris). Fashioned in a freehand linear style on the lamps with wide central discs, the Caesarea Round Class were first considered to be made exclusively for a Christian population (Sussman 1980: 77, n. 4; 78), but the latest evidence suggests they were intended to be sold to a broader market. The limestone moulds for lamps and figurines manufactured from Caesarea were targeted for a broad market but with a prevalence for Christian symbols. These lamps are finewares that used official representations of Christianity, during the christianization of Caesarea, a moment in which the city underwent massive transformations..

Fig. 83. Roman Temple in Cesaréia (areaTP)[81]

The remains of the platform of Caesarea's Temple or King Herod's temple to Roma and Augustus mentioned by Josephus (*Jewish War* 1.414, *Jewish Antiquities* 15.339), was replaced by

[81] Photo: J.J. Gotlieb, http://maritime2.haifa.ac.il/eng/nl/cms23/cms239.htm

an early Christian church temple in about 500 C.E. The massive foundations of this temple were preserved to a height of more than two metres and rested on the bedrock at an elevation of 8.4 m. The new Christian church was octagonal in plan, surmounted probably by a segmented dome and embellished with costly marble pavements and wall revetments.

The christianization of Palestine up to the 4th century CE and onwards consisted of a Christian appropriation of the city's sacred topography, and Caesarea's urban terrain occupied the space of the city's most ancient and revered temple, demonstrating that the landscape was dramatically changed along with the promotion of new symbols and discourses within society. Nothing could demonstrate more clearly this urban perspective of the Christianizing process than the frequent Christian appropriation of the city's sacred topography, just as Jerusalem and Gaza had witnessed after the destruction of pagan cult centres and the building of churches in their places (Holum 1996; Jerusalem e Gaza publicação)[82]. These are classic and strong cases of the Christianization of ancient cities in Palestine. Clearly other elements probably contributed to these urban changes and to the practice of recycling materials that became common in Late Antiquity (e.g. Leone 2013:2). The Early Christian builders exploited the Herodian foundations and used them as leveling where the bedrock sloped downwards on the northwest of the site, and the temple had long been unused for cult purposes, and was perhaps even i a ruinous state, serving as a reminder of iconoclasm until about 500 CE. However, the excavators suggest that the Roman citizens of Caesarea preserved their ancient temple, as perhaps a revered relic that linked them with their city's illustrious past (Holum 1990; 1996)[83]. The church collapsed in the eighth century to be replaced by Muslim domestic buildings.

The most Roman imperial city in Palestine, and later episcopal centre of the ambitious imperial biographer Bishop Eusebius, Caesarea preserved a pagan temple long after other cities of Palestine (Ramalho 2013). The chronological discrepancy between the building of the church in about 500 CE, or perhaps a bit later, after the abandonment or destruction of the Roman temple (much later than the Christianization of the Roman Empire and after the reign of Emperor Constantine), puzzled the archaeologists about the building or complex called-for "intermediate building", which preceded the church and replaced the temple on the same site.

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[82] More information see: http://www.digcaesarea.org/documents/tpblurb.html

[83] Kenneth G. Holum K. Holum *et al.*, "Preliminary Report on the 1989-1990 Seasons," in *Caesarea Papers,* 103-5. The temple foundation appears in fig. 41 on p. 105 as Wall 1080.

Excavations since 1995 have revealed that this building or complex is chronologically situated midway between Herod's temple and the octagonal church. The evidence for 18 or 19 uniform segments of foundations, made with light grey cement matrix containing kurkar and limestone chips, small cobbles, shell, potsherds, and flakes of carbon, are the characteristics of this special place. All the widths of the segments were set in a fill above the robbed out temple stereobate at ca. +11.50 m and a 1-2 m fill must have been brought in to level the area after robbing of the stereobate foundations of the temple. Paganism lasted a long time for Christians: paganism always implied sacrifice and Early Christians combined ambitious claims that they possessed the truth Torah and the major sacrifice (see Insole 2011, Sacrifice). The function of this building or complex, which dated from about 420 C.E, is entirely unknown, but the new occupied space of the temple, especially its north half, differed from it in orientation and extended beyond it.

The octagonal church, the original objective of excavations in area TP, to judge from the rich numismatic evidence, can be dated between 490-540 CE and replaced the Roma and Augustus temple. This church revealed pavements with several fill layers containing ceramic material dated indiscriminately to the 4th-7th centuries. The rise of Christian power can be seen as a rise of the power's periphery or "a freedom of periphery" against Roman control of the *Orbis*. Of course it depends on which side we choose to look, certainly the christian written sources look on this subject as "a freedom of periphery and rising of the moment of equality"; but the rise of christian power changed the landscape through religious and symbolic motivations in contrast and dispute with other peripheral religious groups in Palestine and in the other provinces. The Christianization of spaces during Late Antiquity contributed to the profound religious and cultural changes occurring in the Mediterranean between the early fourth to seventh century CE.

It is interesting to note that the Caesarea Round Class production of lamps doesn't happen without carved menorahs, a representative symbol for light during the period, but also a common Jewish theme; amongst other themes there is the represented image of a Torah shrine with a drawn parochet, found in a tomb near Caesarea Maritima (Siegelmann 1992: 65 ; Fine 1996:171; Lapp 2001b: 297 — VER). A Caesarea round lamp decorated with a floral pattern was also found in the synagogue at En-Gedi (Lapp 1997:205 and 419, figs. 148-49), indicating that this workshop operating in Caesarea was intentionally producing and promoting lamps with monotheism themes and propaganda inscriptions for a mass-market. The manufacture of geometric or floral designs would be an additional tactic to appeal to a wider market (Israeli and Avida 1988: 112, nos. 322-23).

The workshops producing for the monotheistic market during this period, and the production of samaritan[84] class lamps decorated mainly with geometric patterns all appealed to a wider market. In Apollonia a rich variety of decorative patterns of samaritan class lamps are known, allowing the lamp customer plenty of choice. An early production (Sussman Types 1 and 2, Sussman 1983: 77-95; Israeli and Avida 1988:137-141) were dated to the early 3rd to 4th century CE, while a late samaritan manufacture ranges from the 5th to 7th century CE (Sussman Types 3 and 4, Sussman 1983: 73-85). New research suggests the absence of Christian motifs on Samaritan lamps meant that they were not targeting a Christian clientele (Lapp 2006: 371-380); another idea is that Samaritans engaged in many crafts and worked for Christians, such as demonstrated by the mosaic floor of a church at Beth Hashitta (5th-6th CE) and possiblly at Zur Nathan upon the ruins of the Samaritan synagogue (6th-7th century CE, Ayalon 1994, Fig. 18; Ayalon 2002: 284; Sussman 2004: 351-368). These mosaic floors have common elements with those laid at the synagogue at Beth Alpa, Jericho, and Ramat Aviv and Yattir, namely the oblique cross, the lattice, the concentric circles and the palm branches. These decorative traditional patterns from the 4th to 5th-7th century CE closely resemble samaritan clay lamp productions. Also the oblique cross and the X-shaped cross, have common elements on mosaic floors (e.g. Beth Hashitta, repeated 20 times on the carpet) and the decorative pattern on lamps of the samaritan class.

The importance of the synagogue as a centre for teaching the Torah and as a public institution is attributed to the Samaritans (Safrai 1977: 92, 96-97; Sussman 2004:365). The arrangement of two chapels or two rooms – one for prayer and one for study – in synagogue buildings, is also recognized as a Samaritan idea about the organization of space.

Although the moulds were not found so far away, Samaritan lamps can be petrographycally related to the environment of Apollonia, Tell Qasile, Khirbet al-Ḥadra and Tel Barukh Ravikovitch and its immediate surroundings (Iserlis 2015: 223-224). Thus, they were manufactured locally and regionally distributed in the Central Coastal Plain and beyond. Samaritan lamps are abundant in Caesarea (Vine and Hartelius 1986: fig. 30-37, 38-39, 40-41) and entered the competitive market of lamps and active in the city. Samaritan lamps portraying both a menorah and Torah shrine were uncovered at Samra (Magen 1992: 88). In Shechem a mosaic portraying symbols from the oral and written traditions was found, namely the holy shrine, the staff of Aaron flanked by the Ark, and the *menorah*. Seven names of the guardians of the shrine are mentioned in this mosaic. In the Beth

[84] See Sussman 1978: 238-240 and 243 for the "Samaritan" nomenclature adopted for this class of lamps, based on regional map distribution (Sussman 2002: 340).

Alpha synagogue, and in the synagogue of Sepphoris, the scene of the Binding of Isaac can be found on the mosaic floors. This evidence offers a glimpse about which images, allied to the zodiac symbols represented on the Beth Alpha floor, were kept by Jewish tradition (Weiss 2005: 82:25; 94:36-37).

Additional Samaritan lamps decorated with menorah images were found at Apollonia and at Caesarea Maritima (Sussman 1983: 78-90; Holum et al. 1988:197). Samaritan lamps with inscriptions are rare, but still represent evidence for representativeness and a more exclusive market (Naveh 1988: 38; Lapp 1997: 61). However, the presence of the decorative pattern of an oblique cross with Greek letters between the arms: IH (or IK), possibly meaning the inscription: "Jesus Christ Son of God Saviour" appeard on Samaritan lamps. It is necessary to highlight that symbols such as *menorah* with arched branches standing on a circular base, a Jewish and Samaritan symbol, and an open wheel or a double axe, a traditional symbol later related between the symbols of Zeus, can be found on Samaritan lamps too. The symbol of Zeus was incised on the wall at Beth Shearim, which supposedly symbolized the soul (Sussman 1986-7: Fig. 9; Susan 2004: 358). The representations of an Arch or gate or shrine are present in the repertoire of Samaritan lamps and can be related with the sarcophagus from Hammat Tiberias and rites for the dead (Goodenough 1954: 247). A beetle, or crab, are present in the repertoire and one can find links with Christian art such as symbols of resurrection (e.g. mosaic floor of Yattir, Eshel, Magness and Shenhav 2000: Fig. 7). The mosaic floor of the Beth Alpha synagogue has the same symbol of the hand of God in the seven of the Binding of Issac (Susan 2004: 358-359). Mosaics without any human representation, in contrast to the mosaic floor of the Beth Alpha synagogue, were better-laid mosaics, frequently decorated with geometric patterns (e.g. Beth Shean, Zori 1966: Fig. 4).

Together with the oblique cross, which is a very ancient motif found during the bronze age at Gezer, on draught-boards divided into squares, and on the stone door of the tomb from Kafr Yasif, with six oblique crosses among other patterns such as a rosette, a *menorah*, a whirlwind, a shrine and a flower, are all symbols commonly present on lamps of Samaritan production (Macalister 1912, Pl. CCI; Goodenough 1954, no. 44). But the main suggestion is that forbidden decorations such as birds, animals, and fish, as depicted on the sixth century mosaic from Kasr el-Lebia (Domagalski 1990, Pl. 28), were probably replaced by the oblique cross. Generations of Samaritan lamps were decorated with this very common decorative pattern, including types of

lamps from the Beth Shean region made until the 7th to 8th century CE (Hadad 2002: 127-347; Sussman 2004: 202).

As with many other lamps, the decorative patterns on Samaritan lamps were meant to deliver some symbolic message. According to the suggestion of Golan (1991: 163-167), the oblique cross was a protective symbol or a charm to ensure the durability of the building and its good fortune. Oblique crosses fill the façade of a gabled structure topped with birds and are depicted on doors leading to the shrine of lamps (Sussman 2001: Fig. 20). Amongst the geometric patterns, the twelve-unit lattice on Samaritan lamps has been related to the High Priest's breastplate (*hoshen*), the Holy Ark and the Breastplate, also represented on the mosaic pavements of synagogues and on the frescoes of Dura Europos, Syria, as a shrine with columns (Sussman 2004: 355).

The destruction of Athens and Antioch in the third quarter of the third century, in Syria (Athens in 267 CE by Herulians, and Antioch in 260 CE by the Persians), was simultaneous with the appearance of the fourth century red-slipped lamps in both cities. Antioch, during the period of the Persian presence, was captured twice, in 256 CE and again in 260 CE. With the two Persian invasions the city was destroyed and their captives were taken to Persia. The destruction of Antioch by the Persians had a deleterious effect on the Antiochene lamp industry, just as the Herculean sack had on the Athens industry, affecting thus Dura Europos and other production of lamps in Levant (Dobbins 1977). The growing tensions that had been developing between Rome and Persia led to confrontation between Aurelian and Zenobia in 272 CE, and left Antioch and Syria in an unsettled state for more than a decade. What is certain is that by the early fourth century a new type of lamp industry had appeared at Antioch and the lamps bore numerous similarities to those in production at Athens, although the practice of reworking mould and retouching lamps seen at Athens is not evidenced at Antioch.

The 5th century CE North African lamps (nine) recovered from Antioch are evidence for imported lamps on the site, with the exception of the few first century Italian lamps. Several local 5th century CE North African lamp types indicate that a low number of imports are sufficient to affect local production and influence the market. As seen at many centres throughout the eastern Mediterranean world, Antioch had taken its inspiration from North Africa and possibly also from Athens, during the fourth CE. Although the heart-shaped nozzle was abandoned during the fourth century to give place to the production of U-shape Athenian nozzles, this form of nozzle (heart-shaped) is a common feature among 2nd to 3rd century CE lamps at Antioch. This feature can be

traced through the development of the North African lamp industry, especially from the 1st century CE Imperial volute lamps to the 3rd-4th century CE later types with a broad disk, decorated rim, and a pierced handle.

North African lamps in the fifth century introduced additional foreign elements into Syria production. An imitation of the North African lamps (Dobbins Type 18) provides evidence of a conscious attempt to reproduce a foreign model locally (Dobbins types 21 and 22 emerged from the earliest import) during 6th to 7th century CE. As happened with the early lamps (Dobbins type 16), the chronological range of types 17 to 22 can be extrapolated using information from the deposit beneath the citadel basilica at Dibsi Faraj (Dobbins 1997: 120-122). During the Early Roman occupation of the site, Dibsi Faraj can be identified with Athis and most scholars agree that during the Late Roman and Early Byzantine periods, the site was probably known as Neocaesarea, if we combine different sources of information. As the majority of the lamps available for study are from Antioch or Dura Europos, Dibsi Faraj is a midway case. The excavations at Dibsi Faraj in Syria recovered 383 terracotta lamps and fragments in five digging seasons.

These lamps are especially valuable for providing fixed chronological points in the development of Antiochene and northern Syrian types, and improve our understanding of the development of northern Levant production. Syrian types also demonstrate the extent of the influence of Antiochene productions, particularly in the period following the destruction of Dura Europos.

The closely dated sealed deposit 4038.17 at Dibsi Faraj contained two well-preserved lamps of different types. This deposit located on the southwestern corner of the citadel of Dibsi Faraj belonged to an early fourth century house, which was destroyed towards the middle of the century to make way for the construction of a large basilica. A limestone block bearing a date equivalent to 345/6 CE is attributed to the basilica, and the block was reused in the foundations of a nearby Umayyad building. The citadel basilica coin evidence, from the foundation trench, points to a *terminus post quem* 341 CE, with the brief lifespan of the house corroborated by the presence of these two lamps in circulation during the first third of the fourth century.

In the Lamp Deposit in Bath E in Antioch, nearly two hundred disk lamps from the Late Roman period were dumped into one of the rooms of the bath. Although the deposit cannot be determined within a narrow range, it clearly postdates the early fourth century construction of Bath E (a late fifth century CE) and provides important typological and chronological information about

disk lamp distribution and use. Thus, Bath E at Antioch testifies to the prolonged use of disk lamps, and the Dibsi Faraj deposit shows a significant break with the disk tradition, with the disk no longer being used as a decorative function by the early-4th century CE in Syria (Dobbins 1977: 29).
The red-slipped tradition of import was popular at Syro-Palestinian and Antioch sites, and later on unslipped lamps were distributed at the sites along the Euphrates River in northern Syria. The Lamp Deposit (Bath E) shows that the production with a Christian cross at Antioch made its appearance on a significant number of lamps in the region during the 5th century. The lamps from this deposit were produced in a single shop, the only difference between the Christian and other lamps was the cross itself. The earliest example found dates to the late-4th or possibly the 5th CE (Dobbins 1977, cat. no. 326). These Christian symbols appeared on the central part of the lamp, the disk, with the same rim decoration as other lamps on the market.

Dura Europos was subject to influences between the Roman and Persian empires in Syria, and the result on the ancient light industry was a unique blend of Eastern and Western styles. Wheelman lamps of Mesopotamian inspiration were available, at the same time as mouldmade lamps from Antioch and Palmyra were circulating in the market. At Dura Europos seven complete lamps and one fragment in the Middle Mithraeum were found, dating from the 3rd century CE (ca. 210-240 CE). These lamps were under a built-in wooden box or block belonging to the construction period of the temple, and the building inscription of the temple shows that the Mithraeum was restored between the conferring of the title of Augustus upon Geta in 209 CE and the death of Severus in 222 CE (Dobbins 1977: 35). About 137 lamps[85] (Dobbins types 12 and 15) with worn globular decorations, indicate that these lamps were in circulation in the early-3rd CE. Syrian history provides a *terminus ante quem* for the lamps from Dura Europos; the destruction of the city in 256 CE is a well-known fixed point.

The number of first century Italian lamps at Dibsi Faraj and Dura Europos demonstrate that Italian imports influenced the local industry at these sites, serving as direct models for the local craftsmen, and also that the lamps travelled considerable distances inland (Dobbins 1977: 35). The comparison between the imported fragment and the local examples indicate that the erotic figural scenes depicted on the disks of Italian lamps were copied at Antioch in local fabrics, with an extremely accurate emulation (Dobbins 1977: 34-38).

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[85] Dobbins 1977, cat. no. 171, fifty-six nearly identical lamps catalogued by Boer, eighteen of them, part of the Dura-Europos Collection, Yale University Art Gallery, the remainder unknown from Damascus National Museum.

The presence of the lamps at Dura Europos and at Palmyra also emphasizes the well-documented contact between these two cities, but also the presence of Palmyrene archers at Dura Europos should be highlighted because of their association with the Early Mithraeum (dated by two inscriptions in 168 CE and 170/1 CE). The moulds and local fabric of the Dura Europos lamps confirm the manufacture of lamps and inscriptions from Palmyra (Dobbins type 11).. It is interesting that no lamps with Palmyrene inscriptions were found at Dura. The presence of Palmyrene inscriptions on lamps coupled with the total absence of such inscriptions on lamps of the same type at Dura Europos supports the conclusion that the light industry at Palmyra was challengng the power of Rome by producing its own representative lamps, which did not, however, reach other markets (Dobbins 1977:84-85).

The Antiochene disk lamps (Dobbins type 4) flourished during the second and third centuries, as did the contemporary version at Athens and Corinth, demonstrating the wide of the disk lamps, developed from Italian disk lamps during first century CE. The evidence both in the Levant and elsewhere is that a koiné existed in the lamp industry during the 2nd-3rd century CE in the eastern Roman Empire, with Imperial Italian disk lamps as its main source of inspiration for local market production, which in turn became an arena for visual self-group representation and a media for the distribution of symbols. These later productions all sprung from a common ancestor, but as we can see each centre developed its particular version of the type and its own repertoire of disk representations; both for self representativeness and to meet the demands of market groups, with lamps being apotropaic objects within society.

Greek themes (Judgment of Paris, the drinking contest between Dionysos and Herakles, and the Amazon omachy) support the Hellenic chapter of Antioch. The mosaic pavement remains in temples and related inscriptions give evidence of worship of Greek divinities, such as demonstrated by the colossal statue of Apollo in the temple at Daphne (attributed to the Athenian sculptor Bryaxis). Myths such as that of Apollo and Daphne, as well as the role Zeus play in the foundation of Antioch, were repeated into the Late Roman period, which means that the temples and shrines of Greel divinities endured into the fourth century, as indicated by records of the visits made to them by Emperor Julian in 362 CE.

These Syrian lamps (Sussman 2008, type R25, 2, nos. 104-117) have similar figural motifs on the discus, decorated in relief, to those depicted on the so-called provincial Syrian-Palestine lamps (Sussman 2008, type R20). Syrian-Palestine lamps were found in Caesareia with coins dated

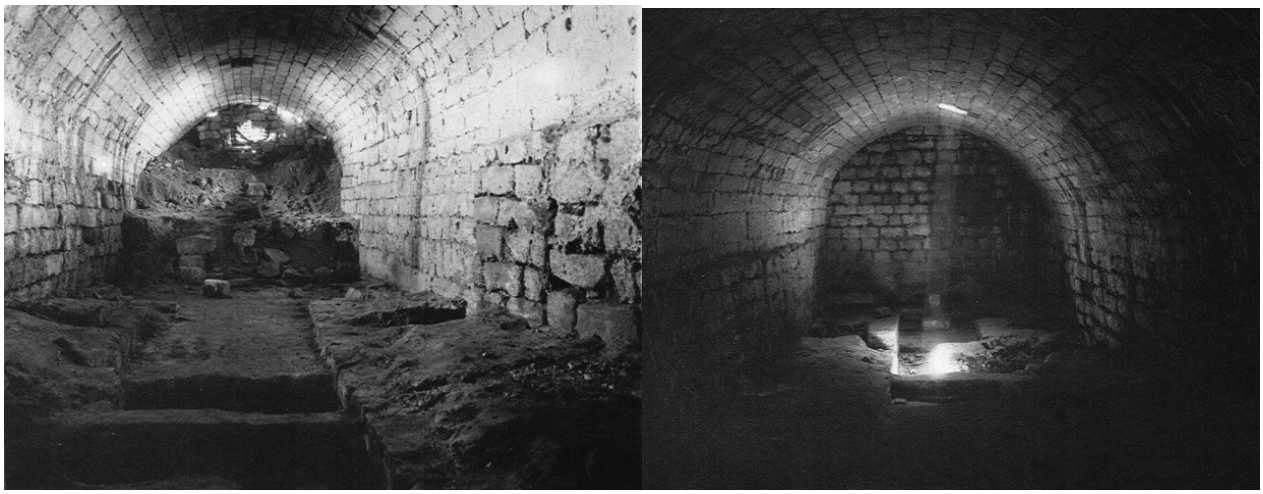
from the 3rd-4th to 6th century CE (Sussman 2008, areas CC and KK), portraying representations such as erodes (112), a chariot (108), an eagle (109 and 117) a cock (114), and stylized geometric patterns (115) can be found on these lamps. In addition, depictions of the *menorah* flanked by the *lullav* and *shofar* can also be found (104, 105, 107, 113) on these lamps. The same type of lamps were found in Alexandria (Reifenberg 1950: 146, 147), Sumaqa (Jewish village on Mt. Carmel, Kingsley 1999, fig. 13: 5-7), Jalameh (Manzoni-MacDonnel 1988, fig. 6-6: 83, 84. 4th century CE), Antioch (Waagé 1941, type 49b+d 135, and 141, dated to the 3rd - 4th century CE; Dobbin 1977: 405, 521, 2nd - 3rd century CE), and at Shiqmona (Elgavish 1994: 115, fig. 89, dated to the 4th century CE, where one of the lamps depicts a bust identified as Constantine the Great, with a Greek inscription hailing a commander. This is a unique specimen that represents the imperial desire to be represented on lamps. The most common imperial media for propaganda were coins and statues. The Beit Nattif and Samaritan lamps also depicted menorah in their productions, and the types of menorah can be distinguished. All those lamps either were fashioned to be sold to Jewish customers in Syria or in the diaspora during the 3rd-4th century CE (Dobbins 1977).

Although many scenes were drawn from a common mythological pool, they were executed in a manner characteristic of individual centres, and the need for lighting was extensive. In order to to sell lamps in the market, workshops had to consider the groups and different places in a dynamic way to cater for the considerable demand for lamps in shops, private homes, and public buildings; that is, domestic, commercial, religious, and funerary contexts (eg in rites for the dead or in religious ceremonies).

During the excavation of the C-8 area in Caesarea, 13 solid buildings characterized as warehouses near the port area of the city were identified. Vault 1 was excavated and like other similar structures was characterized as being part of a *Horreum* that become a *Mithraeum*. Originally, the frame measured an average 31.30m long, 4.95m wide and 4.94m high. However, Vault 1 collapsed in antiquity and the building is now only 20.50m long. The dome ceiling was carefully built with blocks of limestone and sandstone ranging in length from 0.70-1.00 m and 0.50 -0,60m wide and average thickness of 0.30m. Many of these blocks of rock have curved shapes in the arch or dome of the building. Seven layers of rock blocks were used to form the side walls of the frame and about forty smaller blocks formed the dome, with a radius measuring about 2.50m. A passage of 2.80m, measuring 0.86m high and 1.26m wide (Locus C.8.8038), was built on the south wall of the warehouse in order to connect the structure to the neighbouring warehouse (Vault 2).

When the use of the horreum was modified for the Mithraeum, structural changes were made in the building. The holes were covered, and frescoed plaster fragments were found on the walls and floor of the building as evidence of adaptations to receive the Mitra altar; nineteen new holes were drilled next to the ceiling of the room where the altar was found. In addition, the opening of two trapdoors on the roof of the building, one measuring 0.80 x 0.30m, located east-west 14.60m in the structure and the other measuring 12:45 x 00:45, located 3.80m from the east end of the building, allowed light to pass through. Sunlight covered the Mithras altar exactly at the time of the summer solstice (Blakely 1987: 31-32) and the trapdoors played an important role in the cult of Mithras. Three plastered benches (C.8.8065) were erected parallel to the walls and at the eastern end of the building. A space between 1.00m and 1.25m north-south separates the banks of the walls of the warehouse. The benches are between 0.30m wide and 0.35m tall. These benches extend flush to the wall along the building and connect with the one built into the wall of Mithraeum; this bench is almost 1m wide. The seats were made of stone and clay, and were covered with white plaster. The altar (C.8.8066), or the base stone of an altar, was found at the end of the building, measuring 0.61m x 0.62 wide and 0.35m tall, and had a central slot in a channel form on its surface. On the floor (C.8.8046) of this altar a Mitra medallion, a bronze coin of Elagabalus (218/222 CE), frescoes presenting Mitra scenes and 31 clay lamps intact, and other ceramic fragments were found. The small lamps were dated between the 2nd-3rd century CE. Interestingly, some small lamps appear intentionally broken, suggesting a ritual breaking of the pieces before the lighting of the lamps (Blakely 1987: 96-97). This attitude could also be associated with other monotheistic practices of the period as I have been demonsrating in this research. Mithra is associated with the Sol Invictus.

The fact that the sampled oil lamp (Catalogue TB12) from the Mithraeum of Caesarea (Caesarea 73253), as well as the other (with exception Cat. TB14) lamps with distinct intra-site contexts (From areas A, A-3-31 and Area KK28), were manufactured in the region of Tyre. Two observations are relevant: the first is that this kind of lucerne is often characterized as a local production (Lapp 1997; Sussman 2012); and the second is that the lamp (Cat. TB10, Cesareia72186) assigned as manufactured in Knidos, Turkey, is not in fact from there, but from Lebanon, as well as the majority of the so-called provincial Syrian-Palestine lamps assigned through this present research analysis. The lamp with two Erotes seems to be an imitation: the lines that define the disc rings, decorating with stylized leaves of a palm tree on the edge, the volutes and the piece of iconography with a repair incision on the lamp surface, demonstrate the potter's efforts to improve the characteristics of a reusable mould and/or poorly produced copy from another lamp.



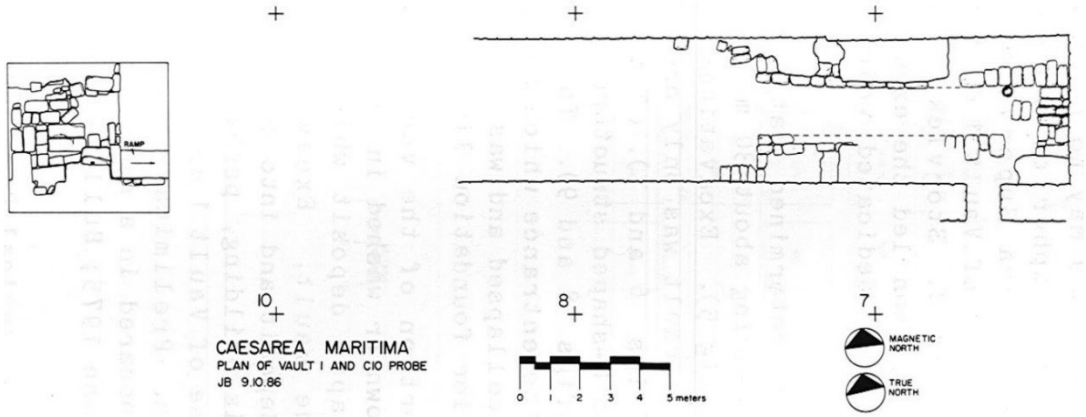


Fig. 84. Mitreum of Cesareia.
Blakely (1987, p. 8,11-12, fig 5,8-9).

It is interesting to note that ceramic petrography opens new interpretations of inter-regional processes, socio-political and cultural changes in Roman Palestine. The reconstruction of complex intersocial networks, especially with a religious nature, as shown in the case of Mithraeum of Caesarea Maritima, were mediated through economic, ideological and ritualistic artefacts. This points to the significant demands of religious groups for the consumption of lights from a votive/ apotropaic perspective and hence the distribution of symbols and religious ideas. Intersocial groups and networks move in spatial and temporal terms, which means through trajectories (Massey 2009: 131-176). Thus, an appropriation of place for the Mithraeum in Caesarea emerges as an active material practice, essentially a product of material practices of power (both for local processing, and for the use and allocation). These patterns of change are constantly being produced and negotiated in the mapping space and limited or expanded within society.

The installation of the Mithraeum transformed this area of the site and played an important role in relations between the social and religious groups of the city. Jews, Samaritans and Christians, especially the latter appear to have suffered the influences of the Mithraism practices in Caesarea. At the end of the second century CE, Mithraism was already widely popularized in the Roman army, and amongst traders, employees and slaves, even reaching the Germanic borders of the Empire. During the third century CE Roman emperors are associated with Mitra as a symbol of authority and triumph, because the strongly hierarchical structure of organization of the cult participants and the character of mysteries and revelations enhanced their powers. Mithraism in Rome was also widespread and more than seventy-five pieces of sculptures, a hundred inscriptions, and ruins of shrines and temples in the city and suburbs, demonstrate the force of this religious practice. The religion of Sol Invictus (syncretism between the religion of Mithra and solar cults of Eastern origin) was established as official in the Roman Empire by Emperor Aurelian in 274 CE.

Mithraism rituals included initiation ceremonies in seven stages, the last making the mystical link with Mitra, enabling the initiated person to participate in the sacred meal of bread, water and wine. The ceremonial ablution (baptism) with holy water, burning incense, sacred chants were also part of the practice. Each day of the week was dedicated to a celestial body and the sun, the light source and Mitra ally, was the most important of these bodies. In this sense, the clay lamps, the most popular object for making light in antiquity, could not fail to play a leading role in the organization of space and material practices related to social group identities.

The cult of Mithras in Caesarea actively participated in the symbolic exchange and practice of material power relations between the groups in the city. The iconography points to the imagistic of worship. As one can see, the potential application of petrographic ceramics studies emerges as a valid and meaningful analytical tool to increase our understanding and raise questions about the relationships of production and consumption, as well as networks, trade and agency of the artefacts in the provinces of the Roman Empire.

I suggest that after 135 CE, when the so-called local Syro-Palestinian discus, or Roman discus lamps in Israel, spread throughout the Levant and dominate the markets, along with Roman symbols and religious themes, the monotheistic Jewish tradition was in crisis and fragmented by the conquest (Two wars) and colonization by the Romans. From this period, an open-call to define Judaism in terms of symbols and torah (oral and inscriptions), began, to help understand the past tradition revived by the Hasmoneans. This revival of past traditions of Hasmoneans called upon the burgeoning Jewish Diaspora to take part in its rebuilding and strengthening through their immigration. The new ruling dynasty wanted to get rid of the foreign Seleucid rule and restored Jewish independence in their land, according to their understanding of its boundaries. During its expansionary period they followed the borders of the Judaea and the Israelite kingdoms in the First Temple period, and even exceeded them, extending into various parts of Transjordan (e.g the Peraea The Jews of the First and Second Temple periods, however, vastly differed in their religious and social profiles (Tal 2009: 72-73)

The magnificent building projects, palaces, fortresses, and memorials defined a new Judean architectural landscape in the Hasmonean period that clearly had a propagandistic function - to grant political, religious, and social legitimacy, and of course, bring honour and grandeur to the ruling Hasmonean dynasty. Beyond the continued use of the Greek language alongside the resurrection of Hebrew for religious and administrative purposes, Hasmoneans also had to communicate with Hellenistic symbols that would be understood by the West as evidence of an ancient past constituting acceptance and recognition. This is one of the reasons why the royal dynasty actively promoted, or at least supported, the redaction of some biblical aporcyphal, geographical, ethnic, and historical works, and the dissemination or translation of some Hebrew works into Greek, such as the oral traditions in Greek, to teach others about their glorious past.

Thus, the erection of the burial pyramids in Modi'in, memorials that could be seen from the sea, aroused many associations with the cult of Greek founder, in the Greek tradition. This means

that the selection of Mod'in was a demonstration for those in the West, since it was not Jerusalem who chose it, but it was the main focus of the Hasmonean rise to power. The aim of the memorial was as a trading place to negotiate control of the landscape. The Mattathias and his sons' dynasty were intentionally helping to forge a common language between the West and the East.

Within the Roman domain, the later raise of Christianity came with the claim that they possess the real truth and major hierofania about the monotheistic tradition revived by Hasmoneans. Further developments can be linked with those with more power in the region and the control of the strongst symbols and most powerful rituals within society. Not only religious aspects but also economic reasons helped to change and shape the lamp market during the transition from the Roman to the Byzantine period in Syria, Palestine and North Africa. In other words, the supreme position of the israelite tradition (that was being equally disputed by many Jewish and Samaritan communities with internal divisions and traditions in the region at this period) was being changed through disputes of power between the main religious groups acting in the social arena. This kind of social dispute can be seen through the market of oil lamps, one of the most representative medias of the period, with wide circulation –, much more so than coins, figurines, statues, or any other means of communication in the Roman world. The reflection of clay lamps in burials and votive places led to implications that clay lamps do not just provide light but also are important to the symbolic discourse in society (Jones 2007: 38; Teixeira Bastos 2011: 112).

The capacity to replicate and distribute new images and symbols between people was also related to new religious power groups controlling Palestine during the 4th century CE, their landscape, and the need to define and differentiate themselves from the hegemonic dominance of traditions. The Slipper "candlestic" class also point to this kind of change, with decorative patterns on the nozzle of the objects that resemble a seven branched menorah with branches standing on a tripod (hence the name 'candlestick'). Greek inscriptions inscribed on mirror of lamps either in full or abbreviated, are present on that lamps class. Slipper lamps with the sentence "The light of Christ shines for all" from Caesarea workshop were apparently more popular than a second type with the phrase "Of the Mother of God", more common in the inscription of lamps found in Alexandria, Egypt, during the 5th century (Nitowski, 1986: 23; Sussman 2008: 250, nos. 206-210).

The evidence for advertising in the Mediterranean and Near East is scarce among lamp makers operating in the market, but the graffiti found on selected lamps demonstrate the use of propaganda, requesting and encouraging the public to buy the product.

The slipper class production was closely associated with early Christianity because amongst the motifs on these lamps, symbols such as the cross or peacock were portrayed (Rosenthal and Sivan 1978: 113, nos. 453-62; Bailey 1988: 288-89, Q2337 PRB, pi. 60). A rich repertoire of exclusively Christian motifs for mould makers and lamp makers of the slipper class were available for copying. The consistent recovery of slipper lamps from Christian burial contexts, plus the fairly abundant images of the cross found on church mosaics, architectural features, and the material culture of the Jerusalem area throughout Byzantine Palestine, has provided a rich repertoire of examples of this exclusively Christian motif (Tsafrir 1993:45-195; Macalister 1912: Tomb 124, Pl. CI). Although they would have appealed to Christians, representations of multiple-branched menorahs with either bi- or tripod bases occur on selected slipper lamps, suggesting that they were manufactured with a Jewish market in mind (Sellers 1951: 42, 44, no. 1; Rosenthal and Sivan 1978:118, nos. 484-86; Magness 1998: 42, lower right; Hachlili 2001: 468-69, Lio.11-13, pis. VII: 4-6; Lapp 2006: 371-377). Slipper lamps bearing depictions of multiple-branched menorahs were unearthed at Tel el-Ful, in Cave 44, and their occurrence in other burial complexes suggests Christian borrowing of Jewish iconography. Further evidence is the marble chancel screen found at Pella, which depicts a mixing of motifs associated with Christianity (cross) and Jewish motifs (shofar, lulav, and menorah) (McNicoll et al. 1982: 55,111,p l. 39a; Lapp 2006: 371-377).

As already mentioned, North African Red-Slip lamps were found in Caesarea that were classified into two groups, probably manufactured in Tunisia, and copied, or imitated in other workshops (Sussman 2008: 250, nos. 217-221; Hayes 1972: 310-311, type IB). These lamps were 4th or early 5th century CE, and a second kind (type 2) from the late 5th century CE. Similar techniques was used to decorated the northern stamped lamps of the Phoenician workshop, but these were stamped before firing (Sussman 2008, no. 121), in relief, within the discus. Among the topics are illustrations of biblical scenes, the menorah with angled arms, and Christian symbols such as a cross and a fish (Caesarea: Vine and Hartelies 1986: fig. 7). The stamps used for decorating the shoulders were of various geometric patterns, among them circles, a design found commonly in Carthage during the 4th to 6th century CE (Hayes 1972: 229-283).

A North African coroplast had an inscribed advertisement for its marker of “fine lamps and statuettes" and a Carthage lamp says, “Please buy our lamps, only one cent; they are the best” (Smith 1966: 17, n. 27; n.28). Thus, selling light also implies the sale of good luck and and blessings. What kind of light you offer to the gods and the meaning of this act would not be mere

details and were highly significant to the buyer. Evidence for the advertisements of places of manufacture is know, such as on the base of a Tunisian lamp “from the workshop of Victoris” in order to promote the lamp maker’s mark (Knowles 1994: 33-34, no. 64, fig. 2.3)

Sussman (2012) types R20 (lamps from Cnidus - short nozzle oil lamps made in Asia Minor - East Greek), type R21 - Short nozzle from Syria, and the so-called Local Syria-Palestinian short-nozzle (R24-R29 - decorated like Roman oil lamps Type R1-R4), the most common lamp found in Palestine, especially in burial caves where clay lamps were employed in rites for the dead and in religious ceremonies.

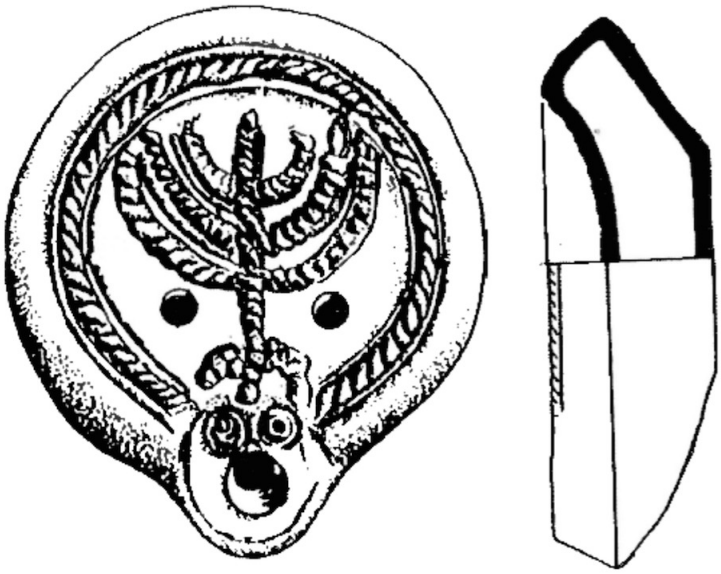


Fig. 85. Oil lamps with Jewish iconography.

These discus lamps were widely popular, especially in the 2nd and 3rd century CE and appealed to both Pagans, Jews, Samaritans and Christians. The refining of marketing practices by designing products, such as Syro-Palestinian lamps to appeal to members of all monotheistic faiths, in order to target specific religious groups, indicates that those objects were intended to be widely spread and that the producers wanted to control the light industry in the region of Tyro and Sidon. The introduction of the menorah in the late 3rd and 4th century CE (Bailey 1988: 251, Q2061-62 MLA, pl. 44, fig. 38) and cross motifs (Bailey 1988: 251, Q2066, pi. 44, fig. 34) on versions of this group support this idea (Lapp 2006: 371-377). Egyptian workshops of the Loeschcke Type VIII

discus lamps also target Christian communities, demonstrating an open mass market of lamps and symbols.

By the fourth century, the depiction of a single menorah became more common on the later versions of this lamp and a seven-branched menorah was found on a fourth-century version of a discus lamp at Sepphoris (Lapp 1996:222, no. 117; Hachlili 2001: 448-51, L4.2-16, pi. 11:82-84; Rosenthal and Sivan 1978: 85). By the 4th century CE morphological improvements enabled clay lamps to carry more sophisticated motifs and/or inscriptions, namely the broader nozzles and shoulders of the Beit Nattif, and the wide central discus of the Caesarea round and slipper forms. All those features helped these products surpass the discus lamp as the types par excellence for depicting Jewish and Christian iconography.

Evidence indicates that Jews were not necessarily offended by such "pagan" imagery, such as demonstrated by the discovery of a Syro-Palestinian discus lamp fragment depicting an erotic scene in Catacomb 20 of the Jewish necropolis at Beit Shearim in Lower Galilee (Avigad 1976: 185, pi. 70:3). Additional Jewish archaeological contexts include the residential quarter at Sepphoris and the Akeldama Tomb in the Kidron Valley (Lapp 1997: 94, n. 34, figs. 74 and 77; sample DS9, 238-39, 257, fig. 98, table 2). Representations of Helios occur on synagogue mosaics at Beth Alpha, Naaran, Hammath Tiberias and Sepphoris (Hachlili 1988: pis. 76- 78; Weiss and Netzer 1996: 26-29) and further reinforce the idea that for the 'Jews of the period' lamps bearing images of Helios were also attractive symbols and ideas. The Jewish association with Helios is substantiated in the archaeological and literary record, and Jewish magical texts also allude to Helios and an image of Helios in carved relief decorates a lintel found in a synagogue at Chorazim (Hachlili 1988: pi. 46; Morgan 1983:71). A discus lamp decorated with an image of Helios was recovered from a synagogue context at Nabratein (Lapp 1996: 221, no. 115). Thus, the various religious motifs and/or inscriptions depicted on lamps belonging to these classes of lamps reflect the differences in religious belief, practice, and custom under Roman rule. Such varied decoration would have aided in the sale of the lamp makers products by appealing to a broad customer base in a competitive lamp market.

13. Process of innovation and cultural change: Power, Spatial Organization and Ritual

"If I am not for myself, who is for me?
And when I am for myself, what am "I"?
And if not now, when?"
(Hilel Pirke Avot I.14)[86]

The distribution of communication standards are durable and retain value after they have been used in society. They are non-rivalry in that others may also use the standards, and - in that no market participant can prevent another from using them. Consequently, network effects related to communication standards are not given or distributed equally in all networks and are subject to differences in network-specific market: that is, different adoption decision results or different adoption times due to heterogenous presences among prospective adopters. The self-reinforcing interdependences between direct and indirect network effects can be the source of the continuous diffusion process through the inclusion of diffusion-theoretical approaches in the theory of network effects. This brings to the table the idea that the critical mass communication in networks depends on the ability of early adopters to determine a positive expected utility value of that network standard, at thesame time as the ability to forecast a certain degree of dissemination of the communication result in the future network (Beck 2006: 216-220).

Understood as an emergent phenomena through the analysis of the variability and dynamics of interconnections, network theory recognizes that ideas and technology are transmitted along social interconnections, and cultural and religious change happen through the diffusion of information ('infomation cascade') across a network. When combined with the sociological theory of religious conversion, it is a way of re-approaching the success of the monotheistic 'innovation' (Collar 2007; 2008). The current understanding of ceramics and trade in the Roman East has been linked with new avenues of research in a attempt to introduce concepts of material culture studies into the domain of Roman archaeology (Poblome et al 2013: 392-400). The development of rational frameworks for approaching the issue of networks has led to innovative

[86] Hillel, Pirke Avot I.14, translated Charles Taylor.

syntheses of the socio-cultural impact and socio-economic positioning of craft activities and religious change (Collar et al 2015).

Network theory is a practical modelling tool for re-approaching the subject of religious change in the ancient world, improving the understanding about a variety of types of change across a variety of disciplines, which in tun, allow us to re-conceptualise the reasons for the success or failure of religious movements (Collar 2008: 240). Archaeology can offer insights by conceiving a network, an environment as a space characterized by interconnected nodes, a valuable heuristic device. Network theory is a processes by which innovation and social change occur. The combination of the environment and the inherited are the main aspects to determine the profundity of that innovation's propagation. The 'vertical' aspect of culture that determines the nature of an innovation (inherited or tradition) and the 'horizontal' aspect, by which the connectivity of the network can be spread, are recourse to a value judgement about the nature of the innovation itself.

The available evidence supports rather than enlarging existing facilities, the notion that sizable manufacturing output was achieved by multiplying small-scale production units. Archaeology suggests that the small-scale production units were geared towards their own regional markets and such processes of horizontal multiplication took place within attested production centres. This process of horizontal multiplication involving many small-scale production units within one or other region resulted in so-called 'production conglomerates' that are typically associated with one or other framework of exchange. Ancient pottery production centres in the Roman East remain poorly understood, but their dominance in their own regions of production (eg. Palestina and North Africa cases) indicates that entrepreneurs were reluctant to take risks, and mainly preferred the markets they knew within their own network and regional radius (McCormick 2001: 58; Poblome et al 2013). According to Poblome et al (2013: 400), the wide distribution patterns of Cypriot, Phocaean and African Red Slip Wares, can be "considered as an aggregate of a patchwork of outputs comprising many regional production centres, with 'pulling forces' that were not necessarily purely commercial in nature". Within the context of broader regional connections in the Roman East, the emergence of Constantinople as the major pole of attraction (or node in network terms), allowed landholders in the area of Sagalassos to specialize and intensify part of their agricultural production, taking networking into account in order to ensure that their produce circulated.

The economic, social, political, religious and cultural forms of demand (or 'pulling forces') must be taken into account when one explains the attested flows of exchange, such as can be demonstrates by clay lamps. The higher presence of African red slip ware along the route connecting Constantinople to the producing region helps to explain an obvious 'pulling force' role that the city emulated. The potential of association with this flow of exchange did not come about simply as a result of tablewares, but a number of flows of exchange were concentrated in Constantinople that are far beyond the scope of this thesis. Although, we should highlight the label of Constantinople as a 'framework of exchange' with the aim of arguing that frameworks are network nodes emitting sustainable pulling forces with demonstrable archaeological effects. The creation of frameworks of exchange that perform in both the geographical and chronological sense, and the fairly high presence of African red slip ware, also the contemporary arrival of Phocaean and Cypriot red slip wares as coincidental during second half of the 4th century CE, resulted from the initial 'brokering force' of the Constantinopolitan node, in the wake of its foundation as a new imperial capital. A interplay between different frameworks of exchange can be considered the result of the fairly high presence of Phocaean red slip ware in northern Levant (Poblome et al 2013: 397-398).

The generally attested prosperous conditions in Phoenicia and Northern Palestine probably were facilitated by the networks and routes flows that were generated by Constantinople. The economic picture in the east during the fourth to seventh century period corresponds to the general pattern in the Mediterranean. The prosperous period from the second half of te 5th century CE continued throughout the 6th century CE in both urban and rural areas, declining only in the 7th century CE. The available archaeological evidence for economic conditions in Phoenicia (Central and Northern) must be regarded as a "snapshot", and the hypothesis of a slow redemption of economic activity in the 4th century CE, after the third-century crisis, is supported by the scant number of floors laid in the 4th-7th centuries CE: thus, supporting the idea of prosperous economic conditions in the late fifth, and especially in the sixth century CE.

Mosaic floors appear to have been fairly uniformly spread throughout the 5th century CE, indicating consistently favourable conditions across that century with a significant number of floors post-dating AD 540. As evidenced by the main room of the Shelomi farm (No. 7/5a) dated epigraphically to 610, in Phoenicia and Northern Palestine, mosaic floors were last laid a few years before the Sassanian conquest of AD 614. The unsuccessful siege of Tyre in AD 616-17 by Jewish

from the Galilee, Jerusalem, and Damascus in the pay of the Persians was a side effect of the conquest. The destruction notably found at the Shelomi farms, and Christian ecclesiastical churches, such as Nahariyya (No. 7/19) and Shavei Zion (No. 7/26a-c), provide evidence for the later period of disruption of the economy in the coastal zone between Ptolemaic and Tyre, for half a century at least (Merrony 2013: 34-38). Foss (1997: 469-486) has suggested that the urban culture of the Roman world did not survive into the 7th century CE.

Fig. 86. Gate entrance to the city of Tyre.

As evidenced by the concentration of mosaics in and around Beirut and Tyre, the clustering of mosaics in cities was counterbalanced by the significant number of mosaic floors in rural sites, suggesting vibrant patronage, both urban and rural, in small towns and villages. Although many of

the mosaic pavements from Phoenicia and Northern Palestine (Group 1, Merrony 2013) cannot be dated accurately, the largest proportion of the corpus are generally ascribed to the Late Roman period; there is also a significant clustering of mosaics in the cities of Northern Palestine.

By combining archaeological and historical sources pertaining to 2,930 settlements, Dauphin (1998) argues that demographic growth was manifest in the vast ecclesiastical building programmes of Constantine in the 4th century CE. Olive and wine plantations were the classic response to the growth in population (Dauphins 1999b: 80). Based on the lack of 5th century CE coin finds from archaeological settlements across Palestine and the Mediterrranean, Safrai (1998: 34-130) has suggested that the economy underwent a period of recovery in the early forth century, but subsequently declined in the fifth century CE. The consequence of overpopulation and the barbarian conquest of the Western Empire lead to the view that the period between the early 5th CE to 490 CE was a period of agricultural, demographic, and economic decline.

Kingsley (1999: 36-40) provided a critical appraisal of the main theories pertaining to the economy of Late Roman Palestine, suggesting that Safrai relied too much on the outmoded primitivist interpretation of the economy. Merrony (2013: 45-46) reviewed the topic for an analysis of mosaic floors. Essentially, a thriving export market, notably in wine, to other parts of the Mediterranean stimulated and intensified the production of these commodities in Palestine and opened up the demands of taxation. Apart from dated mosaic pavements, various economic indicators of the region suggest that the Late Roman period was a period of major changes, for instance seen in the evidence of pottery, epigraphy, and coinage. The picture for much of Central and Northern Phoenicia is unclear, since the publication reports are preliminary confined to specific geographical areas of the Lebanon. Excavations have concentrated particularly on the Souks area of Beirut Central District[87] (Doumet-Serhal el at 2005) a commercially active market.

The adoption of Christianity as the Roman State religion has been suggested as pivotal to the economy of Palestine, in which the export of biblical traditions, relics and pilgrim gifts would also have played a role in stimulating the provincial economy. Avi-Yonan argues (Avi-Yonan 1958:43, 45-47) that prosperity was generated artificially by a massive programme of church building, sponsored by imperial donations in the fourth century and private patronage in the fifth. This was accompanied by a fundamental change in agricultural ownership, notable among the Jewish farming population, many of whom sold their lands and became coloni farmers under the

[87] In the Souks have recently been published: Perring 1997-98; Reynolds 1997-98; Jennings, 1997-98; Shechan, 1997-98; Morss, 1997-98; Butcher 1997-98; Boivin and French, 1997-98; Williams and Murray et al, 1997-98; Seeden and Thorpe 1997-8; Ward 1997-98; and Ludvigsen and Seeden 1997-98.

patronage of wealthy landowners (or inhabited major cities under urban patronage). However, Sperber (1978: 11, 13, 45-46, 51, 59, 136) has argued, using rabbinical literature, that the Middle and Late Roman periods were accompanied by a decline in agricultural productivity and commerce, as a result of political instability and climatic change.

A total of 365 oil presses, mostly located north of Tel-Aviv, Israel, probably Late Roman, have been identified and catalogued by Kingsley (1999: table 3, figs. 34-5). Around 600 oil presses hav been recorded in the Nahariyya zone, 128 in Golan, 28 in the Haifa region, and 53 around Netanya (Merrony 2013: 46). From a total of 899 winepresses, probably Late Roman, the majority (706) are located in Northern Palestine and in the Southern countryside, inside or on the edge of vineyards associated with estates.

The most representative Imperial media, Late Roman coins, were recovered from the Beirut Souks (BEY 006) excavations. They were issues of Emperor Anastasia (491-518 CE), suggesting a marked discrepancy in the number of coins from the 4th and 5th centuries CE, and the issues dated to between the second half of the sixth and the seventh centuries. The numbers, respectively, from both of these periods at the following Jewish sites are Khirbet Shema (6 to 361), Meiron (1 to 567), Gush Halav (3 to 161), Sumaqa (9 to 449) and Zippori (0 to 92) (Merrony 2013: 49). This suggests that the circulation of coinage was particularly vibrant from the end of the 5th century onwards into the 7th century CE with shifting local and regional exchange and trade patterns over that time.

The economic vitality of the Tyre coinage can be attested in the upper Galilee from three sites: Khirbet Shema, Meiron and Gush Halav. The latter notably yielded a large quantity of coins minted at Tyre, form the early 4th century to the 5th century CE (Hanson 1980). As suggested by the results of Meshorer's excavation at Migdal (Meshorer 1976: 54-71), a possible trickle of Tyrian coinage into the Lower Galilee would suggest that Tyre also exerted direct economic influence over an area (that included the Upper Galilee) peripheral to the borders of its administrative and ecclesiastical diocese. Near the synagogue in the village of Korazin (ESI 1984b: 67) an even larger hoard of around 1.000 coins dating to the late 6th and early 7th centuries CE was found. At the synagogue of the village of Qazrin in the Golan (Ariel 1996), a hoard of 180 coins dating to between the reigns of Anastasia and Phocas was uncovered. But at the synagogue of Gush Halav and Sumaqa in the Carmel even larger hoards yielded numbers of 1,943 and 458 Late Roman coins respectively, minted in various parts of the Mediterranean, including Constantinople, Antioch, Alexandria, and Carthage.

The large quantity of winepresses dated to between the 4th and 7th centuries CE indicates self-sufficiency in wine production in Palestine. Despite different press sizes, the average installation consisted of a treading-floor measuring 3.40 x 3.60m, with a collecting-vat measuring 1.30 x 1.70m and 1.10m in depth, with capacity for 2,400 litres of wine. Although large installations have been found in the Christian Village of Khirbet Zikhrin, northern Palestine, with a capacity of around 40,000 litres, and in the Jewish village of Sumaqa in the Carmel, with a capacity of around 45,000 litres, the largest recorded Palestinian winepress is dated to the 4th century CE at Achziv, and has a capacity of around 59,000 litres for wine production. Apparently this period of manufacture was halted after the Arab conquest, as indicated by the dated installations at Ramat Hanadiv, Kiludiya, Khirbet 'Azzun, Kfar Saba, Khirbet Hilal, and Pisgat Ze'ev East A, in Central and Southern Palestine. Reports from 29 sites around the Mediterranean have indicated that the Palestinian Carthage Late Roman 4 (CLR 4) and Carthage Late Roman 5 (CLR 5) amphorae were used to export wine in the late 4th century CE, a process which intensified in the early 5th century CE. Forty-six quantified assemblages from the main period demonstrate that consumption remained high in many provinces of the empire between the fifth century and 650 CE (Merrony 2013: 45-50).

A pottery sequence from Beirut (BEY 004, Hayes 2000:1-8) and a quantitative pottery study in the Souks area of Beirut (BEY 006) have produced informative data concerning the local production and trade of wine from 325 to 350 CE. Phoenician wine amphorae (predominantly type BEY 006.2349) represent a high percentage of the total amphorae samples found. Ceramic deposition continued until around 800 CE, albeit on a reduced scale. This included a variety of locally produced and Palestinian amphorae, locally produced cooking wares, and imported table/ fine wares from Phoecea, Cyprus and North Africa. The archeometric and archaeological evidence points to pre-roman amphorae manufacture along the Tunisian coast connecting Carthage, Neapolis and Zitha (Bonifay et al 2002:125-202; Bonifay et al 2010: 147-160).

The lamps from BEY 006 provide insights into the so-called Syrian-Palestian lamp class with regard to the local and regional economy. BEY 006 has produced a large assemblage of pottery from a cistern dated to the first half of the 1st century CE. The majority of the 280 lamps come from these contexts, with sixteen complete examples. These lamps were probably rejects or broken material from a pottery shop in the area, or a discarded pottery shipment. The evidence of blackened nozzles suggest that these lamps were used in the houses of Beirut, probably in the neighbourhood of BEY006, and were later discarded in the cistern (Mikati 1998: 133-135). The cistern produced

several FAVSTI stamped lamps (Plate 44, figs. 2, 4-8, 10-11) with clear differences in hand writing styles, albeit in the same fabric.

At least 79 oil lamps come from another area of Beirut where there is a series of shops between two small streets (BEY11): these were fine ware lamps of high quality, with no parallels in the region (BEY8 and BEY21). The evidence shows a mixture of originally Greek/Roman motives, especially the acanthus leaves, Leda and the swan, the Three Graces, Pallas Athena/Minerva, Medusa and Pegasus, and motifs from the south-eastern and eastern parts of the Mediterranean area: Serapis, the bird Phoenix, the Phrygian rider, a specific type of bull and Cybele. Representations of the Cybele would symbolize life and and fertility. Serapis, Phoenix and the bull, a woman dressing up, and other erotic scenes demonstrate which symbols were circulating in this area. Lamps with scenes representing some form of power such as the Phrygian rider, a person with a staff, Pallas Athena, the bull and the head of Medusa, demonstrate, as in other sites of the Near East, that the Romans had an eclectic culture, interacting with the culture of the people they conquered (Mikati 2002: 265-271).

The research in Beirut focused on finding a common fabric for the FAVSTVS signature, a fabric that ranges from pale yellow to buff and which has been described on several sites in the Levant. Among the 2,234 lamps recorded ascribed to the Tyre region, the FAVSTVS signature seems to be present on some of those products, which would point to a Faustus workshop in Tyre region. Tyre region products continued to be one of the main imports in Beirut from the late-1st century CE and up to the Late Roman Period. Thus, Tyre was one of the main lamp production centres from the Early to Late Roman periods. (Mikati 2003: 177). The petrographic research in this thesis has demonstrated that the so-called Syrian-Palestinian discus class was indeed mainly manufactured in region of Tyre. The research also suggested that the Phoenician “de Ba’al” lamps (Sussman 2008, type R10, nos. 30-33), a typical lamp from Phoenician workshops manufactured during the 3rd to 4th century CE, had a close relationship with Northern stamped lamps (Sussman types R26 and R27) and the so-called Syrian-Palestinian discus class. Smith (1966: 20) points to Augustan influences, suggesting correctly that this is not a distinct Palestinian type of lamp, but could have originated further north, along the Syrian coast. At Dor these artefacts were called “de Ba’al lamps”, after the site near Tyre in the Phoenician coast, with a chronology of ca. 50-150 CE (Hajjar 1965: 350, Pl. XX; Rosenthal-Heginbottom, 1995, type 28b, fig. 5.23:9). Extra lamps from Sidon and Cyprus provide a few examples of this model dating to the early 2nd century CE (Bailey

1988: 280, no. 2297). These lamps were found also at Sarept and Sajur, in Western Galilee, reinforcing the idea about sources of influence and manufacture controlling distribution (Braun et al 1994, fig. 4:12; Prichard 1988, fig. 72:57, Group XII, mid. third of 1st CE; Sussman 2008:222). Similarly to Caesarea, in Late Roman Berets (Beirut), the city wall dating to the second half of the 4th century CE, took in an area approximately twice as large as the Roman fortification (about 178 hectares) Zippori and Beth Shean expanded during the Late Roman period as evidenced by the extension of Zipopori north-west in the street area, and the circumference of the fortification wall doubled to 4.8km (encompassing 134 hectares) during the early 5th century CE in Beth Shean. Tyre maintained a dominant strategic position in the Levant, playing an important role in coastal trading to Palestine (e.g. Nahariyya, Caesarea, Apollonia and Yafo lamps, cat. TB6 to TB13 and TB15 toTB39), as well as maintaining a connection with Carthage and inland Northern Palestine.

At Tyre, an astounding total of 1,701 lamp fragments and eighty-eight complete lamps were found in the Apollo complex (fig. 136). Except for three Hellenistic and four Byzantine lamps, the remaining lamps date from the first and second centuries CE, but could possibly extend into the third century CE. A bust of the Sun God, Helios flanks the doorway in Shheem, but we can find other carvings of Helios at Ain Harsha (pl. 58) and Kasar Nous (p. 112) (Taylor 1967: 95-96 and 117).

The most successful of the many colonies sent out from the Lebanese homeland was Carthage in North Africa, which become a powerful trading city from the time of its foundation in the eighth century BCE by the Phoenician city of Tyre. North African discus lamps were found in Caesarea (Sussman 2008: 227, nos. 58-60) and elsewhere, as well as in massive quantities throughout the Palestine sites of the Roman Period. Carthage is strategically located between the two halves of the Mediterranean and also possessed western Sicily, which allowed the city to control the main sea routes between East and West. Its influence, stretching from Sicily to the Straits of Gibraltar, the Pillars of Hercules in Antiquity, dominated the western Mediterranean basin. The widespread distribution of "Carthaginian" red slip ware lamps decorated with crosses or menorahs indicates that they were aggressively marketed to satisfy the high consumer demand within the Mediterranean and were manufactured for a local and international Christian and Jewish clientele (Knowles 1994:38-39, nos. 111-13, fig 2.4; Hachlili 2001:458-63, L7.1-33, pi 11:88, Corpus pl. p. 89*). North African lamps portraying menorahs (I suggest the motif was disputed between Jews and Christian when it first appeared on lamps, after the phenomenon of the

intentional breakage of discus lamps was established) probably originated from pagan or christian workshops in the region (Hachlili 1998: 448).

According to Dauphinn (1998), Palestine witnessed economic expansion and dramatic demographic change evidenced by a density of settlement in specific geographical zones between the 4th and mid-6th century CE. The basic correspondence between density of settlement and fertility of soil in Late Roman Palestine favoured the main trends in Southern Phoenicia and Northern Palestine. Terrae Rossae from settlements on the central highlands was ideal for the cultivation of cereals, olives, vines and fruit trees, while brown and pale rendzinae soils were also good for olives and vines, despite being not such rich soils for cultivation. The dark basaltic soils of the Golan and Lower Galilee were slightly less populated, but shared similar properties with the Terrae Rossae soils. The highest part of the Golan Plateau with its deep basaltic brown Mediterranean soils was ideal for growing cereals and fruit trees, thus, the Lower Golan and Eastern Lower Galilee were pasturelands, suitable for growing wheat and barley characterized by basaltic protogrumosols, basaltic brown grumosols and rendzinae. The increase of agricultural production gave rise to a demographic boom which required further extension of the arable land; as well as the intensification of agricultural productivity. During this period (4th century CE), the Christians were still a minority in relation to the Jews and Samaritans. But by the beginning of the 7th century CE, the Christians constituted the majority of the population in relation to the Jewish and Samaritan populations (Dauphin 1998, figs. 42-107).

It has been recognized that the massive interconnected network of cities articulated by frequent communications and exchanges of all kinds, through which services and functions were distributed, never seriously existed before Rome (Woolf 1997). Urban settlements were linked between regional systems of power and exchange, as well as local societies and settlement patterns of consumption. Within a randomly connected network, a 'phase transition' is recognized when most of the nodes join up into clusters, with a few interconnecting links between the clusters. Through the addition of a relatively small number of new links, disconnection and connection occurs, as a result the joining of these isolated groups into one interconnected cluster creates what is known as the 'giant component' (Collar 2007:150). Therefore, the giant component allows for communications across the whole network; events are only felt locally when a network is not connected by the giant component.

Phase transition is vital for understanding the spread of information across networks, once the absence of centrality fosters the emergent process that spreads information across networks to generate the giant component. Far from the centre that determines the action on a network, the centre is created by that action, thus, small events, behavioural switches, and individual choices, that percolate through the system can lead to widespread changes, which in turn could come from anywhere. One of the reasons why monotheism was so successful at this “juncture" (see, Collar et all 2015: 2-32) was due to its capacity to engage with the philosophical argument for one god, to be evidenced amongst the intellectual elite and the producers of symbols in Roman Empire. A ‘monotheistic trend’ has been observed during the Imperial period and monotheism can be called a religious innovation within the millennium of Imperial polytheism (Collar 2007:155). The spread of early Christianity argued that the combination of Christian ideology/self-representation within historical environments reconfigured the ratios of many religions labelled pagan-to-Christian, as well as Jews and Samaritans, with an impact on social networks in a way that ensured the ‘inevitable’ triumph of Christianity.

Archaeological evidence in the Diaspora, shown in Cyprus, of a fourth-century lamp class of local production (Vessberg Type 18), attests to a Jewish and Christian clientele, with Cypriot groups of lamps bearing images of crosses or menorahs (Bailey 1988: pl. 71:317-18, Q2608 MLA, Q2609, Q2610, and Q2613; Hachlili 2001: 456-57, L6. 25-29, Corpus pl. p. 89*). In Greece a similar example of this phenomenon can be found, with a substantial Christian clientele in Athens (Stampolidis and Palermo 2000: 86, no. 63; 195, pl. 6, lower left and upper right; Karivieri 1996: pl. 7:82; pl. 8:83-86, 88, 90; pl. 9:89, 91, 104-5). The conceptual framework which has been developed to comprehend the ‘diaspora’ phenomena employed the notion of ‘double consciousness’, the formation of dual identities and with the complex sense of ‘home’ included. The postcolonial topic of ‘hybridity’ has explored these connections (Bhabha 1994; Said XX). The formation of both local and translocal identities in Diaspora communities are by definition “not-here to stay”; which by consequence means they develop strong attachments to their present place of belonging. The multi-locale attachments of Diaspora create an ambiguity of identity - belonging both here and there - whose particular configurations vary from case to case (Barclay 2004: 2-6). The phenomenon of ambiguity in cultural self-expression provides glimpses about connections with landscapes that relate to the idea of a real and imagined “home”. Thus, hybridity as a complex strategy of multiple cultural identities defies scholars to understand the themes of ‘place’ and 'displacement’ in the discourse of diaspora communities and their adaptive strategies of power and politics.

Fig.87. Bust of Hadrian, Jerusalem Museum, Israel.

In a strict sense, within Roman Imperialism a discrepant form of cosmopolitanism appears though diaspora communities, which bears a unique potential to challenge the demands of cities and the Empire; even if that potential is not realized. Diaspora communities are typically sites of contested power in which subjects with the 'host' community and other diasporas are contested, at the same time as contests over the interpretation of their own 'tradition' are being debated. The Roman province of Judaea was all but annihilated between 66–135 CE. Vespasian ordered the siege of Jerusalem and the uprising led by Simon Bar Kokhba in 132 CE followed, and the central and singular Temple of the Jews was in ruins, and Jews were taken into slavery, over the next half-century. By the reign of Hadrian (135 CE) Jews were permanently expelled from Jerusalem, renamed Aelia Capitolina and the province Syria-Palaestina, and this ban was not lifted until the 4th century CE. The destruction of the real and psychological centre of Judaism changed Jewish existence forever, Collar (2013: 225-246) suggests, based on the epigraphic record, that the tenets of laws and moral codes defined in the Mishnah (the rabbinic halakhah) were swiftly transmitted across the newly activated ethnic network of the Diaspora, shown clearly through a renewed

knowledge of the wider Jewish network. The following Jewish revolts (Bar Kokhba, in the Diaspora in Cyrenaica, Cyprus, and Egypt) were violently suppressed, and dispersed the Jewish nation, opening the space to the 'powerful messianic'.

I believe that early christians and Samaritans were also renewing their knowledge and symbols, mainly through the wider network provided by the tradition revived by the Hasmoneans. It is interesting to note similar ideas about the figure of Jesus that originated in Báucalis, Alexandria and Caesarea, with regard to the definition of many communities of early christians. Major changes regarding the image war of the 2nd-3rd centuries CE resulted from this debate. Despite agreeing with Ário about the conception of Christology, the community church of Caesarea - represented by Eusebius - signed the official Constantine creed of 325 CE. Later Eusebius was the author of the first historical book about early christian tradition, clearly influenced by Flavio Josephus, which went beyond the influence of early christian and rabbinical writings available on the network flow of the Roman East in the 4th century CE (Ramalho 2013: 69 and 233-243). Rabbis in Palestine and Babylon underwent a series of fundamental reforms of the tradition revived by Hasmoneans for self-assurance and an ideology of religion and technological innovation of culture.

Ideological innovation can be found in the records of new practices or rituals. The cultic space can be defined as any space (architecturally or not) delineated for the purpose of worshipping one or more gods, or where some indication for the practice of ritual has been found. Often, many objects of ritual are everyday common items, such as coins, figurines and clay lamps, which have become cultic when deposited beside sacred structures and places. The utility of a technological innovation means that this kind of innovation can be classed as 'evolutionary', but the fate of new religious movements is largely beyond their control, depending greatly on features of the environment in which they appear and the materials they manipulated.

Christian 'orthodoxy' ultimately spread despite competition from various 'heresies', indeed a version of Christianity that happened to have reinforcement from Imperial legislation, and thus provided the 'best fit' for most people's social environment became central as a result of the action on the network (Collar 2013: 158). Orthodoxy was generally imposed from the traditional centre, the static controlling standards through official shared rituals in the Roman Empire during the 3rd-4th centuries CE.

The epigraphic evidence of explicit statements of Jewish identity massively increased in the 2nd- 3rd century CE. The new religious authorities in Palestine used the highly influential strong-tie

connections of the ethnic network of the Diaspora to transmit the religious and social discipline of rabbinic Judaism. Not only that, but because changes were enacted before Christianity was the state religion, they represents the internal transformation of Judaism. The trend during the 3rd–4th centuries CE for individuals to define themselves as 'Jews' or, more often, as 'Hebrews', increased the use of specifically Jewish name forms to more strongly define Jewish identity.

The new universalized halakhah are clearly manifest in the records of the ordinary people of the Diaspora, and this reconstruction of Judaism reflected an increased awareness of a common Jewish practice, history, and behaviour, particularly related to the definition of religious symbols as referents to a universalized ritual and the religious calendar. The hebraization of names in the Diaspora has been suggested as a reaction to Christianity's increasingly intolerant attitudes towards people of other religions and the appropriation of Biblical names during the course of the 4th–5th century CE (Williams 2007: 192). The revived knowledge of the Torah, Jewish Law, Jewish history, and the use of Hebrew as a marker of education are included amongst the reforms of rabbinic Judaism.

The emphasis on reading and interpreting the Torah, and standardizing norms of behaviour of rabbinic Judaism, articulated in network terms, generated groups identified as local clusters, which comprise people who see each other regularly and who can be considered as connected by strong ties (see, Rajak 1992: 11–12; Granovetter 1973: 1361). The combination of local clustering and long-distance links can be described as the 'small-world' network (Watts and Strogatz 1998). The long-distance links transgress local cluster boundaries, forming shortcuts to other clusters. Everybody would represent both a weak and a strong tie, and that identification as such depends on the perspective of people, and that these classifications are flexible and subject to change. The 'small-world' is a global network phenomenon that arises from local network interactions through close-knit community nodes (Collar 2013: 224). Most individuals' social networks can be involved with many aspects of a strong-tie local social network, as well as long-distance weak ties which make important connections between separate local clusters. When it comes to the 'complex' transmission of new ideas or information and the spread of new religious ideas, the core material culture was manipulated and places where it happened could provide access to social networks and influence the decisions of the network.

Jews integrated with Gentile communities in the early Hellenistic-Roman period, engaged with certain aspects of Graeco-Roman culture and adopted Hellenized names and practices. The

Roman environment strengthened interpersonal bonds between Jewish communities and the destruction of the Temple dramatically changed the lives of Jews in Roman Palestine. The tension resulted in re-activating dispersed 'strong-tie' networks built on a new understanding of shared ethnicity of Diaspora Jews. Josephus located the essence of Judaism in the rites of the Temple, and the destruction is lamented in Diaspora works of literature, such as the Fourth and Fifth Sibylline Oracles (Collins 1986: 152; Goodman 1994: 45). Changes for the majority of Diaspora Jews would have been the influx of Judaean refugees or prisoners of war, as well as the transformation of the Temple tax into the fiscus Judaicus, payable to the Romans. Network connectivity was skewed by the post-banishment return of Jews in the 3rd–4th centuries and network was reconfigurd on the island: masking the links with Phoenicia, creating a stronger internal network, and highlighting instead new links to Cilicia and North Africa (Collar 2013: 234).

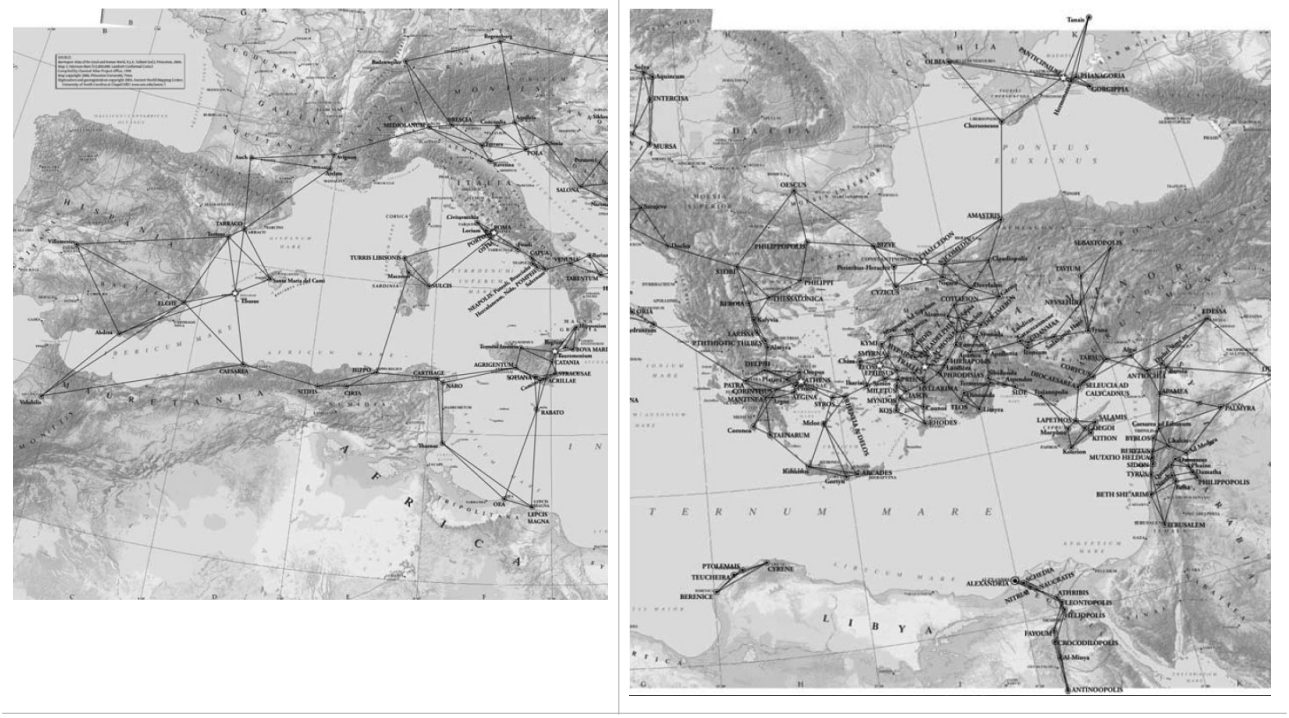
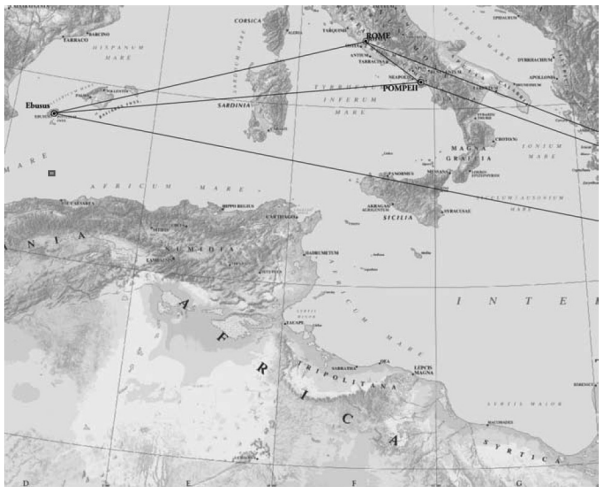
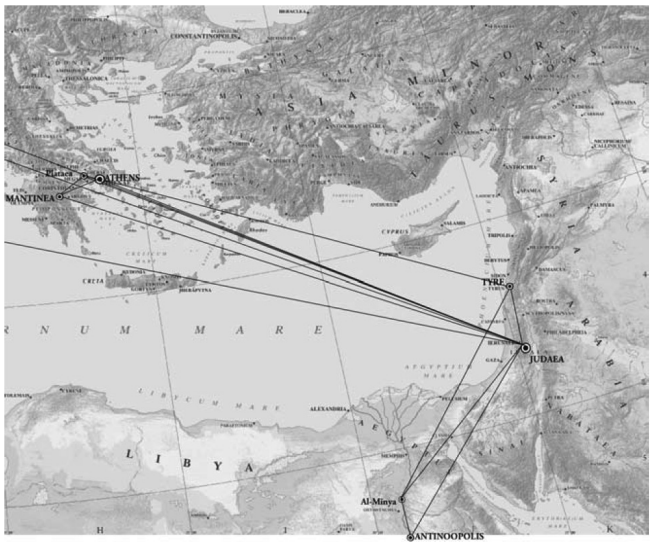


Fig. 88. Jewish Diaspora in the Mediterranean by using Proximal Point Analysis (PPA) (Collar 2013).





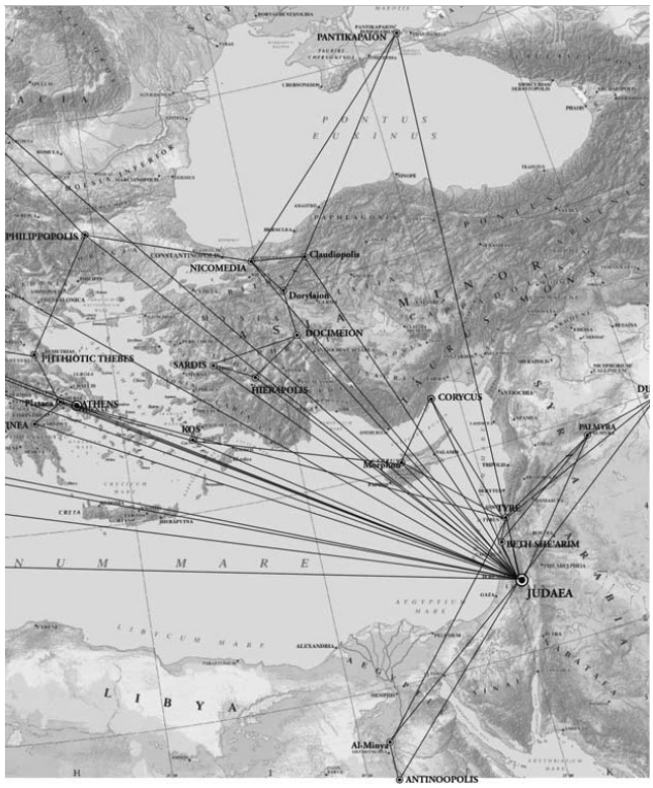
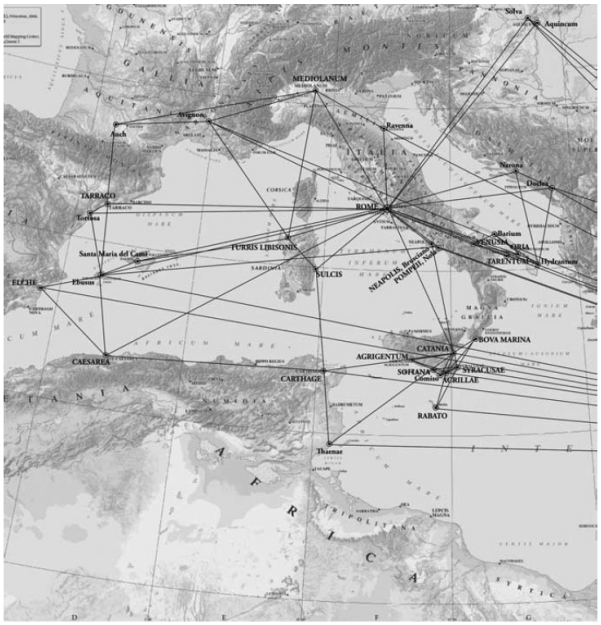


Fig. 88.1. Jewish Diaspora during 3º century CE.



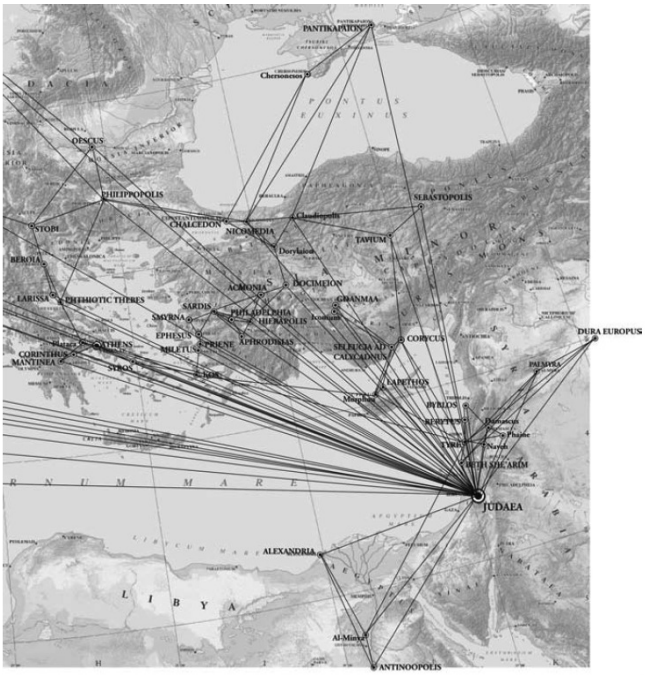


Fig. 88.2. Jewish Diaspora during 4th CE in the Mediterranean by using Proximal Point Analysis (PPA).

The rise in network connectivity in the 3rd century was considerable, meaning Hebraization was a pan-Empire phenomenon, from Caesarea in Mauretania to Pannonia, from Sicily to the Black Sea, rather than an organic process spread through geographically proximate places. Costal cities were affected, such as Carthage, Catania, Hydrantum, Kos, and Corycus, highlighting the importance of geographical position within the network for exposure to and acceptance of new religious ideas. During the 4th century the communities on the coast of Ionia were drawn inland towards the tightly interconnected sites in Phrygia. Phrygia became the connective corridor to the sites in Bithynia, with Nicomedia emerging as a centre between the Black Sea sites and the rest of Asia Minor.

The vast majority of Eumeneian formula inscriptions found in funerary contexts in Phrygia, dating to the 3rd century CE cannot be used as evidence for either Christianity or Judaism. A few inscriptions are clearly Christian and a few are probably Jewish, but the vast majority must be assigned as both Christian or Jewish. Therefore the Eumeniean formula “He or she will have to reckon with the living God” in third century Phrygia could be used either by Jewish or Christian communities in a public funerary context. Jews and Christian were aware that the other groups used

the formula and also expanded it in various ways. The boundaries between some Christians and some Jews may have been hazy, with far less demarcated boundaries than has often been thought (Trebilco 2004: 81-88 in Barclay 2004. The Christian and Jewish Eumeneian Formula).

The problem of death as an evolutionary was major psychological problem for man. The real conception of heroism during Antiquity, maybe even during modern days, are indeed the foremost reflex of the terror of death (Beck 2004: 23-31). Thus, the hero has been acclaimed, probably since the beginning of human evolution, and is widely recognized as a category for the centre of human honour. In the mystery cults of the Eastern Mediterranean, which were cults of death and resurrection, the hero was a man who could go into the spirit world, the world of the dead, and return alive. This is one illustration of how major ideas (i.e. Christianity and Eastern Mediterranean cults) from different clusters can be connected to the interconnecting links between them, thus, creating a 'giant component' through the interconnected cluster (Collar 2007:150) during 4th to 5th centuries CE.

A network of arguments based on the universality of the fear of death, or "terror", is underpinned by the fact that fear of death is universally present. Death is a complex symbol, not particular sharply defined, and fear of death can be carefully ignored or actually absorbed into the process of life. From its beginnings in Greece, through Heidegger and modern existentialism, death became the real "muse of philosophy" and took over religion's central problem.

Substantial data support the assumption that clay lamps played a major role in funerary contexts (table xx, p. x). Mortuari are public rituals, which could include feasts, and are commensal consumption that serve as arenas for politico-symbolic dramas in which idealized representations of social relations are constructed and reproduced at the same time that individuals compete for power and relative definition of their status within that perceived structure (Dietler 1999: 490). The light provisions in funerary contexts are bound up with the subject of manipulation for both ideological and more immediate personal goals.

Power rituals as a form of active device serve as a medium of expression and commensal hospitality, and constitute the syntax in the context of a ritual of consumption, such as food and drink, beyond votive offerings. All those things are highly charged symbolic media because they are a basic and continual human physiological need. Funerary rituals, as an act of consumption, are incorporated directly into the body and become a part of the person's life history. They are also a form of highly condensed social fact embodying relations of production and exchange, and linking

the domestic and politico-economic aspects. Clay lamps in funerary rituals have politico-symbolic potential and are highly charged symbolic media of the Roman Period that constitute a prime arena for the reciprocal conversion of what Bourdieu (1980) calls "economic and symbolic capital" (Dietler 1999: 491).

As tangible symbols of the abstract power of money, coins were used in the burial context during Late Antiquity. This view of money is not exclusively Greek: in the Roman world, the annual ritual of throwing coins into the *Lacus Curtius* links coins with the underworld. The custom for Romans involved a connection with a place revered as an opening to the underworld and coins were regarded as a source of wealth and power, to promote offerings of fertility. In the Tyheodosian Wall cemetery at Carthage many graves have coins (19%), and amongst those the majority (32%) were single coins and just a third of these lamps were coins associated with the head. The cemetery at Carthage also has ten graves with large numbers of coins from 10 to 153, some only wrapped or folded in a cloth, including one grave with four gold solidi and 24 small bronzes, chronologically related to the period of the 5th to 6th centuries CE (Steves 1991: 215-229)[88].

The Charon myth relates to the river of the dead where Charon is the ferryman who demands his fare (portorium) in advance, before he carries the soul over to the further bank in his patched boat, so single coins and small groups of coins that were predominate in Late Antiquity mortuary practices, most often placed at the waist of the deceased may relate to this myth. These types of votive offerings were understood as "doors of communication" with the underworld mundus. The custom of giving coins to the dead, such as the Lacus Curtius, was perceived as an opening between the world of the living and the dead. Christian funerary practice can attest similar connections between this practice of offering coins to the dead and the feast. In 392 CE Augustine wrote to the bishop of Carthage (letter 22) to object to the practice of feasting the dead in Christian cemeteries, because it promoted drunkennes and riotous behaviours, reminiscent of pagan *parentalia*.

Rituals with coins use money as a medium of exchange, a symbolic means of transferring power between the living and the dead, between this world and the next. Coins offered at the time of death were to promote life among the dead, while the door to the other world was still open. This custom in the Roman period was intended as an offering of the dead to the gods or offerings of the

[88] Stevens, Sussan, T. Charon's Obol and Other Coins in Ancient Funerary Practice. Phoenix, Vol. 45, No. 3 (Autumn), 215-229.

living to the dead; all of the practices are based on the conviction of the intrinsic value of money and the importance of the tomb as the threshold to the other world.

Rabbinic halakhah and Christianity were different manifestations of the same cognitive response to Roman colonialism, the consequences of which befell the Jewish people. The 'small-world' network phenomenon shows that weak ties are powerful, but strong ties have the power to change the way people think and believe, especially when related to religious ideas. The long-range effects of strong ties, which are often assumed to operate only at a local cluster level, played a significative role in the sharing and exchange symbols in clusters at Palaestina, Syria and North Africa, especially in regard to the votive role of clay lamps and market appeal. The strong-tie social network required from Jews, Samaritans, Christians and Gentiles an internal change in their religion, promoting better adherence to Laws and moral codes. Clay lamps play a strong-tie social role in their transmision of a message and as such swept across the Roman Empire.

Roman oil lamps, in order to be in demand and used, were imbued with culturally relevant meaning, which was incorporated into social relationships, and then experienced the transformative effects of cross-cultural consumption. North Africa became the main producer of Christian oil lamps, so the main producer of christian media throughout the Mediterranean; while in Palestine, the birth place of the Christian movement, the repertoire of symbols and the production of lamps became more and more selective in the process of an expansionary contest, culminating in the disappearance of the defeated side's symbols of identity (Harrison 1995: 263).

Ethnicity is a complex issue, fluid, socially constructed, and a subjective aspect of identity, open to reconstruction, adoption, and redefinition by different people in different environments. These attributes do not have independent significance, but are largely subjective and become important for group membership only when the group invests them with the power to distinguish between in-group and out-group members (Orlin 2010: 15). This phenomenon shows that the ideology of a religion will always be part of the explanation of conversion. Regardless of the persuasiveness of an ideology, or the transcendence of a vision, the matter of conversion, instead of connected to the quality of religious stimulae, should be understood as a social process, conditioned the networks driving religious change (Collar 2007:155-158).

Religious 'recruitment' can be considered a process of 'brainwashing': the term is a collective one, 'a shorthand for a set of specific social psychological processes, some or all of which

may be operative when ‘mindcraft’ is employed to influence a person or persons' (Taylor 2004: 95-165). These social institutions rely heavily on the power of the group for their success and can be highly coercive. Religious cults and political parties are usually hierarchical and commonly dominate the cognitive landscapes of both leaders and followers. Brainwashing by force is considered a result of the interactions between brainwasher and victim which are personal and highly coercive, whether the brainwasher is following his own agenda or acting as part of a larger social system.

Advertising is much less about coercion, but generally reflects and works within currently accepted ideology. This is brainwashing by stealth, where the attempts to influence are individually weak but accumulate in huge numbers, over time, to form a largely unchallenged background. Created by a few, or even by many, such as sophisticated niche advertising, the one-to-many social structure of advertising, is a form of influence different from that of cults which aimed at undifferentiated mass audiences. Brainwashing, by force or by stealth, is part of a wider array of influence techniques.

The acceptance of an image discourse for the sacred, a long process of iconoclastic action (a discourse of iconoclasm), reaching back from Greek antiquity, can be attested in the Delphic inscription about the condemnation of the Phocian generals Onomarchus and Philomelus via *damnatio memoriae* in the Roman world, and up to the early 8th century CE in Constantinople, when Emperor Philippicus demolished the image of the Sixth Ecumenical Council. His successor, Anastasius, subsequently destroyed Philippicus’ images. This provides a chronological framework for revisiting the fundamental steps within Byzantine iconoclasm that involved thinking about images, including their significance and the impulse to break them (Elsner 1988; Elsner 2012; Elsner and Lorenz 2012).

Fig. 89. Statues decapitated in Caesarea streets.

Leone (2013: 139-144) argues that the *dammatio memoriae* was a costly procedure carried out with the support of the authorities and probably did not occur often in North Africa during Late

Antiquity. Instead of destroying pagan statuary, material was removed and stored for later reuse and reworking. However, she points out that 'mutilation' probably has a stronger symbolic value and is mentioned by a large number of sources. Decapitation and replacement of the head appears to be the most commonly practice in the Imperial period, probably as a less expansive than replacing or destroyig the full statue. In this sense, the face and the head, as the keys to visual recognition and identity, become the focus of the violent acts, while dragging the statue is often connected strictly to action taken against idols (Leone 2013: 140). Occasionally 'iconoclasm' occurred in Late Antiquity in North Africa, pointing to the 'victory of Christianity', which could include a kind of damnation of evil manifested in the abuse of cult images. We shall note exclude the frontal attempt agains the State. The *dammatio memoriae* was an official act, concerning pagan statuary in Late Antiquity, including the creation of the *curator statuarum* in order to avoid massive destruction. A parallel for decapitation and replacement of the head can be found in Caesarea.

R. Hillel the Elder in the Midrash Leviticus rabbah provides evidence for the relationship of the human body and the real human body physical presence when he says: "*As in a theater and circus the statues of the king must be kept clean by him to whom they have been entrusted, so the bathing of the body is a duty of man, who was created in the image of the almighty King of the world.*" (ref. Oren ask).

Many deities, such as Mercurius/Malachbelos-Dionysus, Adonis-Eshmun-Dionysus, an Anatolian god in Gabala, the Phoenician Baal-shamin, the Persian Mithras, and the Greek/Egyptian Sarapis were worshiped in Palestine. All those mentioned were to some extension related to Helios and Sol Invictus, since many gods had solar attributes. Indeed, for the most part these were secondary ideas that composed the triad that existed in the Syrian-Phoenician religious sphere. These deities were characteristically born, died and reborn and Phoenician Baal-shamin and the Syrian Hadad were the supreme gods.

The cult of the sun in Roman Palestine was from the Syrian-Phoenician religious sphere and did not disappear in the Late Roman period; on the contrary, towards the end of the pagan Roman empire this cult was widely disseminated, and the official rite of Sol Invictus that was practised in Rome in the third and fourth centuries was originally Syrian (Friedheim 2009: 97). The continued existence of the cult of Helios in Roman Palestine, specifically in the Late Roman and early Byzantine periods, was closely linked to early Syrian-Phoenician culture, and the mosaic pavement

at Hammath Tiberius shows the sun god and is placed in the centre of a synagogue at its peak worship period in the Roman empire.

Fig.90. Bronze lamps with figuration Helio recently found in a Roman shipwreck in Caesarea harbor.

The Palestinian rabbis therefore did not accept the appearance of Helios. Recently a set of metal lamps depicting Helios image, together with coins and other metal objects were discovered in a Roman shipwreck in the port area of Caesarea (Feinstein and Raanan[89], fig. 91 and 92). The image of Sol Invictus in the third-fourth century C.E. synagogue in Hammath Tiberias was not free of pagan ritual significance. The Late Roman period iconography was a type of ritual guide followed by the believer who was conducting the ritual acts in honour of Mithras, a divinity identified with Sol Invictus. Many Mithraea contain reliefs of Mithras offering the sacred bull, together with Helios dining, uniting the 'power of reproduction embodied in the act of sacrifice with Helios' unique heavenly power of the creation of the world' (Friedheim 2009:122).

[89] http://cnn.it/1OwWFF3

The Severus Synagogue at Hammath Tiberias shows that the worshipers in the synagogue were heavily influenced by the syncretistic meeting of Judaism and paganism. Torah ark, the two menorot are combined with images of Sol Invictus. The archaeological finds from Roman Palestine and its environs strongly support the idea that the cult of the sun was prevalent in this region in the second-fourth centuries C.E. In Talmudic sources, from the second-fourth centuries C.E., the sages of Yavneh regarded sun worship as one of the prominent characteristics of idolatry. The rabbis called idolatry "avodat kokhavim u-mazalot"; which literally means, 'the worship of the stars and the astrological signs' (Friedheim 2009:107). Therefore, some chose the sun, others chose the moon, others chose the stars and signs of the Zodiac, while others still chose the angels, and the sages of Yavneh and Palestinian rabbis, astrolatry, and especially the worship of the sun and the moon, characterized as Gentile cults.

As we learn from the trenchant theological and halakhic debates conducted by the sages of the Mishnah and Talmud, they did not control a uniform society. Jewish society was never uniform (Schwartz 2001; 2009), and groups such as the Sadducees and Boethusians (in the late Second Temple period and the beginning of the Yavneh generation), *amei ha-aretz*, Jewish-Christians, and the Galilean urban elite, and Samaritans were remnants the Land of Israel Amoraim. Due to the existence of Jews worshiping the Sun and moon in the Land of Israel in the period of the Mishnah and Talmud, the Palestinian rabbis accepted the pagan influence on Jewish society. At the same time the Rabbinical class, within the context of interaction with non-Rabbinic Jews, advised followers not to consider seriously the worship of Helios/ Sol Invictus in the Greco-Roman environment. An early fourth century disquisition emphasized that the essential difference between Gentiles and Jews was cult of the sun. In the Palestinian Midrash: R. Azariah in the name of R. Haninah say: "*Only the sun was created to give light; then why was the moon created? Rather, the Holy One, blessed be He, anticipated that in the future the peoples of the world would turn them into divinities. The Holy One, blessed be He, said: If they are two, opposed to each other, yet the peoples of the world treat them as divinities , how much more would they do so if they were only one!"* (*Genesis Rabbah* 6:1 ed. Theodor-Albeck, p. 40; Friedheim 2009:110). The ritual of Sol Invictus is problematic, but Kore-Persephone and other depictions broadcast a cultic message that did not arouse any special problem in halakhic because the gentiles' ritual consciousness was assimilated as primarily cosmic. Thus, a monotheistic explanation was between some who chose the sun, others chose the moon, others chose the stars and signs of the Zodiac, while others chose the angels. The Holy One occupied the middle position, above these deities.

Fig. 91. Statuette of Selene, the moon goddess and the fragments found in Caesarea wreck.

Jews of Roman Palestine, both the sages of the Mishnah and the Amoraim, were aware of the religious-cultic significance attributed to Sol Invictus and of the religious and social danger inherent in the conduct of this god's rite. The Tannaim were direct transmitters of an uncodified oral tradition and Amoraim expounded upon and clarified the oral law after its initial codification. The Amoraim followed the Tannaim in the sequence of ancient Jewish scholars, but apparently despite criticism of Jews in general were not under their authority; by extension, early christian authors such as the Apostolic Fathers and Apologists advised against pagan cults and pratices. Roman law, at this period, beginning in the late second century to 3rd century CE, viewed the Patriarchs (representing the Rabbinical establishment) as the leaders of the Jews (Rabelo 1987: 54).

A number of inscriptions containing theophoric names derived from the name Helios were unearthed in Hauran, Lebanon, and northern Syria. During the Roman period, especially in the third century CE, the rite of the sun god was undoubtedly the main cult of the city of Emesa in Syria. A Roman-period altar bearing the image of a sun god, and with a dedicatory inscription to Helios or Chronos, came to light in Berytus (Beirut, Mouterde 1957: 51). In Antioch, Helios appears on city coins from the third century C.E and in Tyre a number of gems with depictions of Helios from the Roman period were uncovered. In the vicinity of Tyre, a Roman-period altar is apparently dedicated

to a local Zeus with cosmic powers, and the image of Helios appears on one side of the altar and would help to explain the double axes on Syria-Palestinian (or better Syria-Phoenician) clay lamps.

A temple of Helios functioned during the second-fourth centuries CE at Mount Senaim in the Hermon. Both the supreme Syrian god Hadad and the Phoenician Baal-shamin are identified with Jupiter Heliopolitanus in the Roman period in this region, accompanied by Helios on the left side and Selene/Luna, the Greco-Roman moon god, on the right (Urman 1974: 185-186). However, it is difficult to precisely identify the deity worshiped in the temple in the Lebanese Bekaa Valley. It is noteworthy that the sides of the altar are embellished with depictions of Sol Invictus and of Luna, the moon goddess (Friedheim 2009: 104-106). This syncretistic rite was prevalent in the Hermon and in the Lebanese Bekaa, and one of its important centres was in the city of Heliopolis-Baalbek. The village of Bted'i, northwest of Heliopolis-Baalbek in Lebanon, contained a third-century CE. altar to Mercurius Heliopolitanus, with Helios appearing on one side of the altar. In short, in Baalbek Jupiter replaced Zeus, and combined the Canaanite-Phoenician Baal tradition with the cult of the sun. Jupiter assumed the symbols that earlier belong to Baal-shamin: fertility, rain and water, storms, and lightning!

Collar (2008: 240) demonstrates that the actual innovation of the cult of Jupiter Dolichenus 'spread across a strong-tie social network, and that the particular strong-tie network of the officer class of the Roman military was conducive to the swift propagation and dissolution of novel religious forms'. Therefore, a single change or adoption promoted a stochastic network growth to trigger an information cascade, that gave rise to multiple consequent events. By contrast, the cult network of Theos Hypsistos as 'a series of small interactions between Jew and Gentile combined to create a fragile system, manifest in the god-fearers, that was subject to mass change given the right environmental factors'.

The epigraphic 'trace' of a self-organised reaction between Jews and Gentiles marks the emergence of the cult of Theos Hypsistos in the second-third century CE. Combining elements of an information cascade driven by a single event, with a network that displays a level of self-organised criticality, the spread of information across the 'ethninc' network formed by the re-Judaization of the Diaspora help to raise more clearly the statement of Jewish identity, following the destruction of the Temple in AD 70 and the Bar Kokhba revolt. The patterns in the epigraphic show that religious 'conversion' and change cannot simply be attributed to the superiority of the religious innovation; instead it 'is fundamentally driven by the social networks formed by the believers, and

these networks are embodied'. The Rabbinic reforms, catalysed by external political factors and events, and formated across the 'activated' network of groups from Jewish Diaspora, propitiate a fragile network ready for change.

Syrian-Phoenician religious elements with Graeco-Roman ritual characteristics can be attested at Jerusalem. Aphrodite was worshipped in Aelia Capitolina as a merely Grecianized version of the Phoenician Astarte. In a military city such as post-War of Destruction Jerusalem, the Roman army was responsible for the spread and success of important pagan rites throughout the Roman Empire, such as the Persian rite of Mithras,[5] the Anatolian-Syrian rite of Jupiter Dolichenus. Roman soldiers and veterans, and the beliefs of the Tenth Legion's soldiers, should certainly be taken into account in any reconstruction of the city's pantheon (Friedheim 2007: 125-128). Observed in different places in Roman Palestine, the rite of Cybele can also be found in Geva (Mishmar ha-Emek). As indicated by the numismatic and epigraphic finds in the city, there was a temple of the god Men, seemingly active from the time of the emperor Domitian (81-96CE). The rite of the Phrygian goddess Cybele in Roman Palestine and its surroundings allows us to surmise the existence of the Hilaria festival. Scholarly research has also shown that some Tannaim, such as R. 'Akiva, had detailed knowledge of the Syrian, and especially Anatolian, rites. Talmudic literature demonstrates how people of Semitic-Eastern descent viewed Gentile culture, while Graeco-Roman literature provides information about the various Gentile practices and the ritual atmosphere that reigned in the region.

Archaeological evidence and distributions of epigraphic texts (Stern 2007: 91, map 4) from North Africa suggest the possibility both of regional and cultural variations within the Jewish North African populations. The adaptation into North Africa's regional and transregional cultures include rare rabbinic texts from the Palestinian and Babylonian Talmudim that mention rabbis who had traveled to or were associated with Africa (i.e., y. Yoma 1.3; b. Ro Haanah; Stern 2007: 96). This might indicate Jews in Babylonian and the Palestinian texts had some awareness of the presence of Jews in Africa. Talmudic texts themselves add little to our understanding of the realities of North African Jewish practices, devotional or otherwise. North African Jews' ancestries might appear to be obscure, but their presence in North African culture iss not.

The complex expressions of identity within each cultural landscape leads us to think Jews were embedded in local culture to the same degree as their neighbours. While scholars have largely

treated Jews as exceptions to North African cultural processes, the term “Jewish” means something different among distinct populations and in different places and times, such as in “North African”. These terms are tools to improve our understanding of cultural identities in Roman North Africa, Syria and Palestine, neither fixed nor exclusive.

CONCLUSION: Final words and future researches

The results of this research suggest that future research should focus more on production processes, to evaluate integration at different scales, with and without large urban centres, and the factors enabling market integration. Such factors include the existence of large urban centres generating high demand for goods and their relationship to pottery production centres, as well as the resources necessary for large-scale artisanal production, and the varying roles and proportions of traders and institutions commercially active in multiple markets within the framework provided by the Roman Empire (Broghmans and Poblome 2016: 405-406). This approach therefore can be used to evaluate other explanatory factors, and it can be applied to other types of archaeological material and in other regions of the empire.

Most scholars agree that the Roman East trade system was a complex affair influenced by multiple factors, and this research has highlighted the communication that relies upon shared frames of reference, not only of object functionality but also object symbolism, since material culture entails codependency of mind, action, and matter (Hales and Hodos 2014: 20-21). The same can be argued for visual culture, not just the use of similar materials or visual cultura, but also the reinforcement of identity and meanings behind the use of such material. Therefore, material and visual culture are embodied in strategies of communication shared by cultural codes. Goods and consumption bring information about exchanging social systems and demands of markets. The

selection, adoption, and use of goods, is an integral aspect of this system where people mediate materials and meanings. Culture as a practiced product, similar to materials, moves across borders in order to be transferred, thus the practice of signifying must also be displaced, as identity and meaning become reinterpreted in new contexts. Consumption research therefore may focus on the symbolic aspect of goods, how they look, and their role as communicators; as well as loss of meaning, appropriation, or re-evaluation, as we see happen with clay lamps. Therefore goods can be used to draw lines of social relationships and may mark boundaries between groups in order to create and demarcate differences or commonalities between individuals and groups.

Bibliography

Adams, A.E., Mackenzie, W.S., and Guilford, C. 1984, *Atlas of sedimentary rocks under the microscope*. London: Longman Group UK, Longman Scientific & Technical.

Adan-Bayewitz, D. and Wieder, M. 1992, Ceramics from Roman Galilee: A Comparison of Several Techniques for Fabric Characterization. *Journal of Field Archaeology* 19, 189-205.

Adan-Bayewitz, D. 1993, *Common Pottery in Roman Galilee: A Study of Local Trade.* Ramat-Gan: Bar-Ilan University Press.

Adan-Bayewitz, D., Asaro, F., Wieder, M., and Giauque, R. D. 2008, Preferential distribution of lamps from the Jerusalem area in the late Second Temple period (late first century BCE – 70 CE). *Bulletin of the American Schools of Oriental Research* 350, 37-85.

Adams, A.E., Mackenzie, W.S., and Guilford, C. 1984, *Atlas of sedimentary rocks under the microscope*. London: Longman Group UK, Longman Scientific & Technical.

Adler, N. 2004, *A Comprehensive Catalog of Oil Lamps of the Holy Land from the Adler collection*. Jerusalem: Old City Press.

Akerraz, A., Camporeale, S., and Papi, E. 2013, *Sidi Ali Ben Ahmed - Thamusida 3*. Roma: Edizioni Quazar.

Alehouse-Green, M. 2004, An Archaeology of Images. Iconology and cosmology in Iron Agen and Roman Europe. London: Rutledge.

Almeida, J.M.F. 1952, Introduzão ao estudo das lucernas romanas em Portugal. *O Arqueólogo Português, série 2*, Lisboa.

Alicu, D., Nemes, E. 1977, Roman Lamps fro Ulpia Traiana Sarmizegetusa. *BAR Supplementary Series 19*.

Althoff, G. 2003, Die Macht der Rituale. Symbolik und Herrschaft im Mittelalter. Darmstadt.

Amaré Tafalla, M.T. 1984, Lucernas romanas de Bilbilis. Publicaciones de la Institución "Fernando el Católico", Zaragoza.

Amaré Tafalla, M.T. 1987, Lucernas romanas de la Rioja. Gobierno de La Rioja/Instituto de Estudios Riojanos, Logroño.

Amaré Tafalla, M. T. 1988, Lucernas romanas en Aragón. Publicaciones de la Institución "Fernando el Católico", Zaragoza.

Amaré Tafalla, M.T., Guiral, L. 1994, *Representaciones arquitectónicas en lucernas romanas*. León: Universidad de León.

Anselmino, L., and Pavolini, C. 1981, “Terra sigillata: lucerne”, In Enciclopedia dell’arte antica, classica e orientale. Atlante delle forme ceramiche I: ceramica fine romana new bacino mediterraneo, media e tardo antico. Rome, 184-207.
Anselmino, L. 1982, "Le lucerne rinvenute negli scavi della missione archaeologic Italiana a Cartagine: problemi tipologici e cronologici". In *Colloque sul la céramique antique (Carthage, 1980)*. Tunis 157-170.
Arie, E., Goren, Y., Same, I., 2011, Indelible Impression: Petrographic Analysis of Judahite Bullae. In: Finkelstein, I., Na’aman, N. *Studies in the Archaeology and History of Israel in the Late Bronze Age, Iron Age, and Persian Period in Honor of David Ussishkin*. Winona Lake, Indiana: Eisenbrauns.
Arubas. B. and Goldfus, H. 1995, “The Kilnworks of the Tenth Legion Fretensis”, The Roman and Byzantine Near East: Some Recent Archaeological Research, *JRA Supplementary Series 14*, 95-107.
Aviam, M., and Syon, D. 2002, Jewish Ossilegium in Galilee. In: Rutgers, L. V. (ed). 2002, *What Athens has to do with Jerusalem. Essays on Classical, Jewish, and Early Christian Art and Archaeology in Honor of Gideon Foerster*. Leuven: Peeters.
Aviam, M. 2004, J*ews, Pagans and Christians in Galilee: 25 years of archaeological excavations and surveys. Hellenistic to Byzantine periods*. New York: University of Rochester Press.
Avigad, N. 1976, *Beth She’arim Report on the Excavations during 1953-1958, Vol. III*. Catacombs 12-23. Jerusalem.
Ayala, G. 1990, Alba-la-Romaine (Ardèche): the terracotta lamps, Narbonne Archaeological Review, 23, 153-212.
Ayalon, A., Bar-Matthews, M., Goren, Y. 2004, Authenticity examination of the inscription on the ossuary attributed to James, brother of Jesus. *Journal of Archaeological Science 31*, 1185-1189.
Bang, P.F. 2008, *The Roman bazaar, a comparative study of trade and markets in a tributary empire.* Cambridge: Cambridge University Press.
Bajenaru, C. 2013, Contextes Ceramiques de Tomis. (I). Un ensemble de la fin du II-debut du IIIs. ap. J.-C. *Pontica XLVI.* Constantza: Muzeul de Istorie Nationala si Arheologie.
Balíl, A. 1980, Estudios sobre lucernas romas, 2. Studia archeologica, Universidad Santiago de Compostela, 62.
Ballet, P., Bonifay, M., Marchand, S. 2012, Africa vs Aegyptus: routes, rythmes et adaptations de la céramique africaine en Egypte. Bourdeaux: Ausonius, Maison de l’Archéologie.
Bailey, D.M. 1975, *A Catalogue of the Lamps in the British Museum, I, Greek, Hellenistic and Early Roman Pottery Lamps*, London.
Bailey, D. M. 1985, Excavations at Sidi Khrebish, Benghazi (Berenice), vol. 3, part 2. The Lamps. *Libya Antiqua Suppl. 5*, Tripoli.
Bailey, D. M. 1988, *A catalogue of the lamps in the British Museum III. Roman provincial lamps.* London, 178-202.
Bajenaru, C. 2013, Contextes Ceramiques de Tomis. (I). Un ensemble de la fin du II-debut du IIIs. ap. J.-C. *Pontica XLVI.* Constantza: Muzeul de Istorie Nationala si Arheologie.
Ballet, P., Bonifay, M., Marchand, S. 2012, Africa vs Aegyptus: routes, rythmes et adaptations de la céramique africaine en Egypte. Bourdeaux: Ausonius, Maison de l’Archéologie.
Bang, P.F. 2008, *The Roman bazaar, a comparative study of trade and markets in a tributary empire.* Cambridge: Cambridge University Press.
Barbera, M., Petriaggi, R. 1993, *Le Lucerne Tardo-Antiche di Produzione Africana*. Istituto Poligrafico e Zecca Dello Stato: Libreria dello Stato.
Barbera, M. 2003, Modelli culturali egemoni sulle lucerne romano-imperiali: teatro, anfiteatro e circo. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Bar-Nathan, R., Atrash, W. 2011, *Bet She’an II*, *Baysãn The Theater Pottery Workshop*. Jerusalem: Israel Antiquities Authority.
Beard, M., North, J., and Price, S. 1998, *Religions of Rome. Volume I - A History*. Cambridge: Cambridge University Press.
Beard, M., North, J., and Price, S. 1998, *Religions of Rome. Volume II - A Sourcebook*. Cambridge: Cambridge University Press.
Bechtold, B., and Schmidt, K. 2007, “Lampen”. In: Niemeyer, H., Doctor, R., and Schmidt, K. *Karthago. Die Ergebnisse der Hamburger Grabung unter Decumanus Maximus, Teilband II: Die Funde, II*. Mainz, 594-616
Becker, E. 1997, *The Denial of Death*. New York: Free Press Paperbacks.
Ben-Dov, M. 1982, *The Dig at the Temple Mount*. Jerusalem.

Ben Hassen, H., and Maurin, L. 2004, *Oudhna (Uthina). Colonie de veterans de la XIIIe legion. Histoire, urbanism, fouilles et miss en valeur des monuments*. Bordeaux: The Encyclopedia of Ancient History, First Edition,144-145 and 231-232
Bémont, C., and Bonnet, J. 1984, Lampes et fabricant de lampes, *Studien zur Römischen Keramik Vorträge des 13, internationale Kongresses der Rei Cretariae Romane Favtores* in München 12-15 September 1982, Munich, 135-155.
Bémont, C. 2003, *Les lampes de Glanum*, Montpelier.
Berlin, A. M. 1999, The Archaeology of Ritual: The Sanctuary of Pan at Banias/Caesarea Philippi. *BASOR 315*, 27-45.
Bes, P., Poblome, J. 2007, (Not) See the wood for the trees? 19.700+ sherds of Sigillata and What we can do with them…*Rei Cretariae Romanae Acta 40*, 1-10.
Bes, P., Poblome, J. 2009, African Red Slip Ware on the move: the effects of Bonifay's Études for the Roman East. In: Humphrey, J.H. Studies on Roman pottery of the provinces of Africa Proconsularis and Byzacena (Tunisia): homage à Michael Bonifay. Rhode Island: Journal of Roman Archaeology.
Bes, P. 2015, Once upon a time in the East. The chronological and geographical distribution of Terra Sigillata and Red Slip Ware in the Roman East (Roman and Late Antique Mediterranean Pottery 6). Oxford: Archaeopress.
Besnier, M., Blanchet, P. 1900, Musées et collections archéologiques de l'Algérie et de la Tunisie, 9, Collection Farges.
Betriu, R. C. 2008. Les Llànties Romanes de Baetulo (Badalona). Universitat de Barcelona, Tese de doutorado.
Bevan, E. 1957, *Symbolism and Belief*. Boston: Beacon Press.
Beydoun, Z. R. 1977, The Levantine countries: the geology of Syria and Lebanon (maritime regions). In: Nairn, A.E.M., Kanes, W.H., and Stehli, F.G. (eds) The ocean basins and margins. 4A: *The eastern Mediterranean*. Plenum Press, New York and London, 319-353.
Biale, D. 2007, *Blood and Belief. The circulation of symbol between Jews and Christians*. Berkeley: University of California Press.
Bibliowicz, A. M. 2013, Jews and Gentiles in the Early Jesus Movement: An Unintended Journey. New York: Palgrave Macmillan.
Bielfeldt, R. 2014, The Lure and Lore of Light: Roman Lamps in the Harvard Art Museums. In: Ebbinghaus, S. (ed.). 2014, *Ancient Bronzes through a Modern Lens*. Introductory Essays on the Study of Ancient Mediterranean and Near Eastern Bronzes. New Haven and London: Yale University Press.
Bijker, W.E., Hughes, T. P., and Pinch, T. F. 1993, *The Social Construction of Technological Systems. New Directions in the Sociology and History of Technology*. Massachusetts: The MIT Press.
Binford, L. R. 1989, Styles of Style. Journal of Anthropological Archaeology 8, 51-67.
Bisi Ingrassia, A.M. 1977, Le lucerne fittili dei nuovi scavi di Ercolano. In: Carandini, A. 1977, *L'instrumentum domestico di Ercolano e Pompei nella prima età imperiale, Quaderni di cultura materiale*, I, Roma.
Bishop, R.L., Rands, R.L., and Holley, G.P. 1982, Ceramic *Composition Analysis in Archaeological Perspective.* Advances in Archaeological Method and Theory 5: 275-325.
Blakely, J.A. 1987, Caesarea Maritima. The Pottery and Dating of Vault 1: Horreum, Mithraeum and Later Uses (The Joint Expedition to Caesarea Maritime excavation reports, v.4). New York: The Edwin Mellen Press.
Blanco-González, A.; Kreiter, A.; Badreshany, K., Chapman, J.; Pánczel, P. 2014, Matching sherds to vessels through ceramic petrography: an Early Neolithic Iberian case study. Journal of Archaeological Science 50, 139-152.
Blänsdorf, J. 2010, The Rexts from the Fons Anna Perenna. In Gordon, R.L.; and Simón, F.M (eds). 2010, Magical Practice in the Latin West.Papers from the International Conference held at the University of Zaragoza 30 set-1Oc 2005. Leiden-Boston: Brill.
Bleu, S. 2003, Le mobilier du sanctuaire du Luminaire à Lachau (Drôme). In: *S.F.E.C.A.G. Actes du congrès de Saint-Romain-en-Ga*l, Marseille, 497-512.
Bodel, J., Olyan, S.M. 2008, Household and Family Religion in Antiquity. Oxford: Blackwell Publishing Ltd.
Bonifay, M., Capelli, C., and Brun, C. 2012, Pour une approche intégrée archéologique, pétrographique et géochimique des sigillées africaines. In: Cavalieiri, M., De Waele, E., Meulemans, L. 2012, I*ndvstria Apivm. L'archéologie: une démarches singulière, des pratique multiples*. Belgique: Presses universitaires de Louvain.

Bonifay, M., Capelli, C., Franco, C., Leitch, V., Riccardi, L., and Millet, P. B. 2013, Les Thermes du Levant à Leptis Magna: quatre contextes céramiques des IIIe et IVe siècles. *Antiquités Africaines 49*, 67-150.
Bonifay, M., Tchernia, A. 2012, Les Réseaux de la céramique Africaine (Ier - Ve siècles). In: Keay, S. (ed.) 2012, *Rome, Portus and The Mediterranean*. London: Archaeological Monographs, The British School at Rome.
Bonifay, M., Capelli, C., Martin, T., Picon, M., and Vallauri, L. 2002-2003, Le Littoral de la Tunisie, Étude Géoarchéologique et Historique (1987-1997) La Céramique. *Antiquités africaines, t. 38-39*, p. 125-202.
Bonifay, M., Capelli, C., and Polla, S. 2002-2003, Notes de céramologie africaine Observvations Archéologiques et Archéométriques sur les Céramiques Modelées du Groupe dit 'Calcitic Ware'. *Antiquités africaines, t. 38-39*, p. 431-440.
Bonifay, M. 2005, Observations sur la typologie des lampes africaines (IIe - VIIe siècle). In: Chrzanovski, L. (ed). 2005, *Lychnological Acts 1. Actes du 1er Congrès international d'études sur le luminaire antique*. Montagnac: Éditions Monique Mergoil.
Bonifay, M. 2005, Observations sur la diffusion des Céramiques Africaines en Méditerranée Orientale durant L'Antiquité Tardive. Paris: Mélanges Jean-Pierre Sodini, *Travaux et Mémoires 15*, 565-581.
Bonifay, M. 2007, Ceramic Production in Africa during Late Antiquity: Continuity and Change. In: Lavan, L., Zanini, E., and Sarantis, A. (ed). T*echnology in Transition A.D. 300-650*. Late Antique Archaeology 4, 143-158.
Bonifay, M. 2011, Production et diffusion des céramiques africaines durant l'antiquite tardive: modèles classiques, approches nouvelles. In: Attouit, R. 2011, When did Antiquity end? Archaeological case studies in three continents. *BAR International Series 2268*, 15-30.
Bonifay, M. 2013, Africa: Patterns of consumption in coastal regions versus inland regions. The ceramic evidence (300-700 A.D.). In: Lavan, L. (ed). 2013, Local Economies? Production and Exchange of Inland Regions in Late Antiquity. *Late Antique Archaeology 10*, 529-566.
Bonifay, M., Capelli, C., Drine, A., Fantar, M., and Ghalia, T. 2010, Approche Archaeologique et Archaeometrique de la production d'amphores puniques et romaines sur le littoral tunisien. Tunis: Histoire et Patrimoine du Littoral tunisien, Institut National du Patrimoine.
Bonifay, M., Capelli, C., Drine, A., and Ghalia, T. 2010, Les Productions D'Amphores Romaines sur le Littoral Tunesien: Archéologie et Archéometrie. Rei Cretariae Romanae Favtorvm Acta 41, 1- 9.
Bonnet, J. 1982, *La production d'un atelier de lampes romaines en terre cuite, Céramique antique en Gaule. Actes du Colloque de Metz* (Nancy, 1985), 107-131.
Bonnet, J. 1988, *Lampes céramiques signées. Definition critique d'ateliers du Haut Empire, Documents d'Archéologie Française 13*, Paris.
Boucher, J.P. 1977, Circonscription de Rhône-Alpes. In: Galia. Tome 35 fascicule 2, 473- 494.
Boucher, J.P. 1980, Circonscriptions de Rhône-Alpes. In Galia. Tome 38 fascicule 2, 507- 534.
Boudagher-Fadel, M.K., Noujaim Clark, G. 2006, Maritime Lebanon: a key to Eastern Mediterranean Cenozoic history.Stratigraphy, vol. 3, no.2, 81-118.
Boudagher-Fadel, M.K. 2013, Biostratigraphic and Geological significance of planktonic foraminifera. London: OVPR UCL.
Bourdieu, P. 1996, Razões Práticas: Sobre a teoria da ação. Campinas: Ed. Papirus.
Boucher, J.P. 1977, Circonscription de Rhône-Alpes. In: Galia. Tome 35 fascicule 2, 473-494.
Boucher, J.P. 1980, Circonscriptions de Rhône-Alpes. In Galia. Tome 38 fascicule 2, 507-534.
Boudagher-Fadel, M.K., Noujaim Clark, G. 2006, Maritime Lebanon: a key to Eastern Mediterranean Cenozoic history.Stratigraphy, vol. 3, no.2, 81-118.
Boudagher-Fadel, M.K. 2013, Biostratigraphic and Geological significance of planktonic foraminifera. London: OVPR UCL.
Bournias, L.C. 2014, Roman and Early Byzantine Lamps from the island of Naxos in the Cyclades. *BAR International Series 2616 (I)*, 787-798.
Brand, J. 1953. Ceramics in Talmudic Literature. Jerusalem
Brand, J. 1969-1970, Jewish vessels during the Mishnah time. Eretz Israel 9: 40-41.
Brentchaloff, D. 1972, *Lampes antiques du musée de Clermont* (mémoire de maitrise; signalé dans RACF, 13, 165.
Broneer, O. 1930, Terracotta Lamps. Cambridge, Massachusetts: Harvard University Press.
Brughmans, T. 2013, Thinking Through Networks: A Review of Formal Network Methods in Archaeology. *Journal of Archaeological Method and Theory 20*, 623-662.
Brughmans, T., Keay, S., Earl, G. 2014, Introducing exponential random graph models for visibility networks. *Journal of Archaeological Science 49*, 442-454.

Brughmans, T. & Poblome, J. 2016, Roman bazaar or market economy? Explaining tableware distributions through computational modeling. Antiquity 90, 393-408.
Buc, P. 2001,The Dangers of Ritual. Princeton.
Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G. and Tursina, T. 1985, *Handbook for Soil Thin Section Description*. Albrigton: Waine Research.
Bussière, J., Rivel, J.C. 2012, Lampes antiques de Méditerranée. *BAR Internation Series 2428*.
Bussière, J. 1995, Lampes d'Algérie II. Lampes grecques, hellénistiques et tardo-républicaines. *Antiquités africaines 31*, 231-276.
Bussière, J. 2000, Lampes antiques d'Algérie I. *Monographies Instrumentum 16*: Montagnac.
Bussière, J. 2007, Lampes antiques d'Algérie II. Lampes tardives et lampes chrétiennes. *Monographies Instrumentum 35*: Montagnac.
Bussière, J. 2008, Nouveaux outils de potiers africains d'époque romaine (IVe - Vie S.). Pisa, Roma: *Facta 2*, A Journal of Roman Material Culture Studies.
Bussière, J. 2012, Production et circulation des lampes tardives d'Algerie. In: Chrzanovski, L. 2012, Le Luminaire antique, Lychnological Acts 3. Montagnac: Éditions Monique Mergoil.
Bullock, P., Fedoroff, N., Jongerius, A., Stoops, G. and Tursina, T. 1985, *Handbook for Soil Thin Section Description*. Albrigton: Waine Research.
Caetano, J. 2001, *Lucernas Romanas de Conimbriga Escavações de 1963-1970*, Faculdade de Letradas da Universidade de Coimbra, dissertação de Mestrado.
Caetano, J. 2002, "Lucernas da necrópole romana da Lage do Outro (Crato)", *Conimbriga*, n. 41, Universidade de Coimbra, 197-217.
Calado, J. E. 2012, O Santuário de Santa Bárbara de Padrões - uma Perspectiva Religiosa e Artística na Lusitânia dos Séculos I a III d.C. Lisboa: Universidade Nova de Lisboa, dissertação de Mestrado.
Cañete, C. 2010, Classifying an Oxymoron. On black boxes, materiality and identity in the scientific representation of the Mediterranean.
Capelli, C., Lazreg, N.B., and Bonfay, M. 2006, Nuove Prospettive nelle ricerche archeometriche sulle ceramiche nordafricane: L'esempio dell'atelier di sullechtum-salkta, Tunisia Centrale (I-VI secolo D.C.). Bari: Edipuglia.
Capelli, C., Bonifay, M. 2007, Archéométrie et Archéologie des Céramiques Africaines: une approche pluridisciplinaire. In: Bonifay, M., and Tréglia, J.C. 2007, LRCW2 Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and Archaeometry. *BAR International Series 1662 (II)*.
Capelli, C., Bonifay, M. 2014, Archéométrie et Archéologie des céramiques africaines: une approche pluridisciplinaire, 2. Nouvelles Donnes sur la céramique culinaire et les amphores. In: Poulou-Papadimitriou, N., Nodarou, E., and Kilikoglou, V. 2014, LRCW 4 Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean: Archaeology and archaeometry, The Mediterranean: a market without frontiers. *BAR International Series 2616 (I)*.
Carandini, A. (dir.), Anselmino, L., Pavolini, C., Saguì, L., Tortorella, S., Tortorici, E. 1981, Atlante I, Atlante delle forme ceramiche. I. Ceramica fine romana nel Bacino mediterraneo (medio e tardo impero). Rome : Enciclopedia dell'arte Antica, Classica e Orientale.
Casella, E. C. 2005, The Archaeology of Plural and Changing Identities, Beyond Identification. New York: Kluwer Academic/Plenum Publishers.
Castro, L. 1960, "Lucernas mineiras", *Estudos, Notas e trabalhos do serviço de Fomento Mineiro, Vol. XIV, Serviço de Fomento Mineiro, Direcção-Geral de Geologia e Minas, Lisboa*, 281-299.
Ceci, M., Schneider, G. 1994, Analisi chimiche su gruppi di lucerne bollate di fabbricazione urbana. In: Epigrafia della produzione e della distribuzione. Actes de la VIIe Rencontre franco-italiane sur l'épigraphie du monde romain. Rome: École Française de Rome, 433-446.
Cerdán, A. M. 2003, Implantación romana y asimilación cultural en la hispania septentrional a través de los testimonios lucernarios. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Cerulli Irelli, G. 1977, Officina di lucerne fittili a Pompei, in Carandini 1977, pp. 53-72.
Chaniotis, A. 2009, The Dynamics of Rituals in the Roman Empire. In: Hekster, O., Schmidt-Hofner, and Witschel, C. (eds), Ritual Dynamics and Religious Change in the Roman Empire. Leiden, 3-29.
Chrzanovski, L. 2010, De Retour sur les lampes "de Sagalassos" et D'Autres Lampes Égyptiennes Signées du IIe Siècle AP. J.-C. *Archaeologia 61*, 1-10.
Cocco, M. B., Gavini, A., and Ibba, A. 2012, L'Africa Romana: Transformazione dei paesaggi del potere nell'Africa settentrionale fino alla fine del mondo antico. Volume primo. Roma: *L'Africa Romana 19*, Carocci editore.

Cocco, M. B., Gavini, A., and Ibba, A. 2012, L'Africa Romana: Transformazione dei paesaggi del potere nell'Africa settentrionale fino alla fine del mondo antico. Volume secondo. Roma: *L'Africa Romana 19*, Carocci editore.
Cohen, S. L 2013, Excavations at Tel Zahara (2006-2009). The Hellenistic and Roman Strata. *BAR International Series 2554*.
Cohen-Weinberger, A., Goren, Y. 2004, Levantine-Egyptian Interactions During the 12th to 15th Dynasties based on the Petrography of the Canaanite Pottery from Tell el-Dab'a", *Ägypten und Levante XIV*, 69-100.
Collar, A., Coward, F., Brughmans, T., and Mills, B. J. 2015, Network in Archaeology: Phenomena, Abstraction, Representation. *Journal of Archaeological Method and Theory 22*, 1-32.
Collazos, L.F., and Calles, J.M. M. 2010, Nuevas Lucernas del Museu Nacional de Arte Romano. *Anas 23*, 37-64.
Comaroff, J., and Comaroff, J.L. 1991, *Of Revelation and Revolution: Christianity, Colonialism, and Consciousness in South Africa*. Vol. 1. Chicago: University of Chicago Press.
Comaroff, J., and Comaroff, J.L. 1997, *Of Revelation and Revolution: Christianity, Colonialism, and Consciousness in South Africa*. Vol. 2. Chicago: University of Chicago Press.
Cooke, B., and Macy, G. 2005, Christian Symbols and Ritual: An Introduction. Oxford: Oxford University Press.
Courty, M. A., Goldberg, P., and Macphail, R. 1989, *Soils and Micromorphology in Archaeology*. Cambridge: Cambridge University Press.
Criado-Boado, F. 2014, Archaeologies of Space: an Inquiry into Modes of Existence of XScapes. In: Kristiansen, K., Smejda, L., Turek, J. (eds). 2014, *Paradigm FoundArchaeological Theory - Present, Past and Future. Essays in Honor of Even Neustupny*. Oxford: Oxbow Books, 61-83.
Crîngus, M.B., and Stefanescu, A. 2008, The lamps with deities representations in Roman Dacia. In: Roman, C.A., Gudea, N. 2008, Lychnological Acts 2. Trade and Local Production of Lamps from the Prehistory until the Middle Age. Cluj-Napoca: Editura Mega.
Crnobrnja, A.N. 2006, Cult purpose of Roman Lamps in Moesia Superior. Belgrade: Miroslav Lazic.
Crnobrnja, A.N. 2008, Economic aspects of the use of Roman oil lamps in Moesia Superior. Sofia: Academic Publishing House.
Cueillens, I. 2000, Les lampes à huile de Bordeaux: l'apport de la Coté Judiciaire. *SFECAG. Actes du congés de Libourne*. 177-188.
Dan, J., Yaalon, D.H., Koyumdjisky, H., and Raz, Z. 1972, The soil association map of Israel, 1:1,000,000. *Israel Journal of Earth Sciences, 21*, 29–49.
Dawkins, R. 2006, *Deus, um delírio*. Trad. Fernanda Ravagnani. São Paulo: Companhia das Letras.
De Certau, M. 1984, The practice of Everyday Life. Translated by Steven Rendall, Berkeley: University of California Press.
De la Fuente, G.A.; and Vera, S.D. 2015 (De la Fuente, G.A.; and Vera, S.D. 2015, Aplicación de Software de Análisis de Imágenes (SAI) en la caracterización tecnológica de cerámicas arqueológicas: alcances, limitaciones y perspectivas. *Chungara, Revista de Antropología Chilena, Vol. 47*, n. 2, 257-265.
Delvigne, J.E. 1998, *Atlas of Micromorphology of Mineral Alteration and Weathering*. Canada: Mineralogical Association of Canada.
Dan, J., Yaalon, D.H., Koyumdjisky, H., and Raz, Z. 1972, The soil association map of Israel, 1:1,000,000. *Israel Journal of Earth Sciences, 21*, 29–49.
De Certau, M. 1984, The practice of Everyday Life. Translated by Steven Rendall, Berkeley: University of California Press.
De Miro, A., Polito, A. 2012, Lucerne in sigillata africana, ceramica fine e da fuoco dalla necropoli paleocristiana di lampedusa (Sicilia). *Rei Cretariae Romanae Favutorum Acta 42*, 267-272.
Deneuve, J. 1969. Lampes de Carthage. Paris.
Deneuve, J. 1972, "Céramiques et lampes africaines sur le côte de Provence", *AntAfr 6*, 219-240.
Deneuve, J. 1986, Note sur quelques lampes africaines du IIIe siècle, AntAfr 22, 141-161.
Deonna, W. 1927, *L'ornamentation des lampes Romaines, Revue Archéologique 26*: 233-263.
Derfler, S. 1989. "Roman Fortress (Stratun II)". In:Herzog, G., Rapp, Jr., and Negbi, O.(eds) Excavations at Tel Michal. Israel: Tel Aviv Univ. Sonia and Marco Nadler Institute of Archaeology, Publications of the Institute of Archaeology, N. 8, Ze'ev. (Minneapolis, MN: Univ. of Minnesota Press), 191, 193, fig. 14.3, nos. 13-16.
De Santis, T., Disantarosa, G., Iannetti, E., Lentini, D., Mittica, D., Nuzzo, D., Piepoli, L., Polito, V., and Rocco, A. 2012, Il cimitero tardo antico di Ponte della Lama (Canosa di Puglia). Bari: Edipuglia.

Dever, W.G., Gitin, S. 2003, Symbiosis, Symbolism and the Power of the Past. Canaan, Ancient Israel, and Their Neighbors from the Late Bronze Age through Roman Palaestine. Winona Lake, Indiana: Ersenbraus.
De la Fuente, G.A.; and Vera, S.D. 2015 (De la Fuente, G.A.; and Vera, S.D. 2015, Aplicación de Software de Análisis de Imágenes (SAI) en la caracterización tecnológica de cerámicas arqueológicas: alcances, limitaciones y perspectivas. *Chungara, Revista de Antropología Chilena, Vol. 47*, n. 2, 257-265.
Delvigne, J.E. 1998, *Atlas of Micromorphology of Mineral Alteration and Weathering*. Canada: Mineralogical Association of Canada.
Dietler, M., Herbich, I. 1994, Ceramics and Ethnic Identity: Ethnoarchaeological observations on the distribution of pottery styles and the relationship between the social contexts of production and consumption. In: *Terre Cuite et Soicété. La céramic, document technique, économique, cultural*. Editions APDCA, Juan-les-Pins.
Dietler, M. 1998, Consumption, Agency, and Cultural Entanglement: Theoretical Implications of a Mediterranean Colonial Encounter. In: Cusick, J. (ed). 1998, *Studies in Culture Contact: Interaction, Culture Change, And Archaeology*. Carbondale: Souther Illinois University (Center of Archaeological Investigations Occasional Paper 25), 288-315.
Dobbins, J. J. 1977, Terracotta Lamps of the Roman Province of Syria (Volumes I and II). Unpublished PhD Thesis, University of Michigan.
Dobres, M.A., and Robb, J. E. 2000, *Agency in Archaeology*. London: Routledge.
Donaldson, T. L (ed). 2000, Religious Rivalries and The Struggle for Success in Caesarea Maritima. *Studies in Christianity and Judaism/Études sur le Christianisme et le Judaisme, number 8*. Canada: Wilfrid Laurier University Press.
Dore, J., and Keay, N. 1989, *Excavations at Sabratha 1948-1951. The Finds, Part 1, The Amphorae, Coarse Pottery and Building Materials*. London: Society for Libyan Studies Monograph No. 1.
Doumergue, F. 1938, Catalogue raisonné des objets archéologiques du musée de la ville d'Oran (musée Demaeght) Pars II. Oren: L. Fouque.
Dubertret, L. 1945, *Carte géologique au 50.000*. Feuille de Beyrouth, Beirut.
Dubertret, L. 1945, *Carte géologique au 50.000*. Feuille de Saida, Beirut.
Dressel, H. 1899, Inscriptions Urbis Romae latinae. Instrument Domesticum, *Corpus Inscriptionum Latinarum* XV 2.1: 782-870.
Eckardt, H. 2002, *Illuminating Roman Britain. Monographies Instrumentum 23*. Montagnac: Éditions Monique Mergoil.
Edmondson, J. 2014, Economic Life in the Roman Empire. In: Bruun, C., and Edmondson, J. 2014, *The Oxford Handbook of Roman Epigraphy*. Oxford: Oxford University Press.
Edmondson, J. 2014, Roman Family History. In: Bruun, C., and Edmondson, J. 2014, *The Oxford Handbook of Roman Epigraphy*. Oxford: Oxford University Press.
Edwards, D. R (ed). 2004, Religion and Society in Roman Palestine: Old Questions, New Approaches. London: Routledge.
Eilberg-Schwartz, H. 1992, *People of the Body. Jews and Judaism from an embodied perspective*. New York: State University of New York Press.
Ellis, S. 1994, Lighting in Late Roman Houses. *TRAC 94*, 65-71.
Eliade, M. 1978, A History of Religious Ideas, Volume 1, From the Stone Age to the Eleausian Mysteries. Chicago: The University of Chicago Press.
Elsner, J., Lorenz, K. 2012, The Genesis of Iconology. *Critical Inquiry, vol, 38*, no.3, The University of Chicago Press, 483-512.
Elsner, J. 1988, Image and Iconoclasm in Byzantium. *Art History Vol. 11*, no. 4, 471-491.
Elsner, J. 1991, Cult and Sculpture: Sacrifice in the Ara Pacis Augustae. *The Journal of Roman Studies*, vol. 81, 50-61.
Elsner, J. 1996, Inventing imperium: texts and the propaganda of monuments in Augustan Rome. In: Elsner, J. 1996, *Art and Text in Roman Culture*. Cambridge: Cambridge University Press.
Elsner, J. 1997, The Origins of the Icon: Pilgrimage, Religion and Visual Culture the Roman East as 'Resistance' to the Centre. In: Alcock, S. 1997, The Early Roman Empire in the East. *Oxbow Monograph 95*, 178-199.
Elsner, J. 2003, Style. From "Critical Terms for Art History". Chicago: The University of Chicago Press.
Elsner, J. 2006, Inventing Christian Rome: the role of early Christian art. In: Edwards, C., and Woolf, G. 2006, Rome The Cosmopolis. Cambridge: Cambridge University Press.
Elsner, J. 2012, Iconoclasm as Discourse: From Antiquity to Byzantium. *Art Bulletin volume XCIV*, number 3.

Elsner, J. 2013, Objects and History. In: Miller, P. N. (ed). 2013, Cultural Histories of the Material World. Ann Arbor: The University of Michigan Press.
Eilberg-Schwartz, H. 1992, *People of the Body. Jews and Judaism from an embodied perspective*. New York: State University of New York Press.
Ennabli, A., Mahjoubi, A., and Salomonson, J.W. 1973, *La nécropole romaine de Raqqada*. Tunis: Ministère des affaires culturelles et de l'information.
Ennabli, A. 1976, *Lampes chrétiennes de Tunisie (Musées du Bardo et de Carthage)*. Paris: Éditions du Centre National de la Recherche Scientifique.
Eramo, G., Giannossa, L.C., Rocco, A., Mangone, A., Graziano, S.F., and Laviano, R. 2013, Oil Lamps from the Catacombs of Canosa (Apulia, Fourth to Sixth Century AD): Technological features and typological imitation. Archaeometry voulme 56, issue 3, 575-391.
Evans, J. D. 2006, The Coins and the Hellenistic, Roman and Byzantine Economy of Palestine. The Joint Expedition to Caesarea Maritima. Excavation Reports. Volume VI. Boston: American Schools of Oriental Research - ASOR.
Fabian, P., and Goren, Y. 2001, A Byzantine Warehouse and Anchorage South of Ashqelon. *'Atiqot XLII* , 211-220.
Fabian, P., and Goren, Y. 2002, A new type of late Roman storage jar from the Negev. In: Humphrey, J.H.(ed). 2002, The Roman and Byzantine Near East, Volume 3. Portsmouth, Rhode Island: *Journal of Roman Archaeology.*
Fabricius, F. 2009, *Die Religion des Imperium Romanum. Koine und Knfrontationen*. Tübingen: Mohr Siebeck.
Fabbri, V. 2003, Lucerne da Classe: proposta per una tipologia. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Fahlander, F. 2008, Differences that matter. Materialities, material culture and social practice. In: Glorstad, H., Hedeager, L. 2008, *Six Essays on the Materiality of Society and Culture*. Sweden: Norwegian Research Council.
Fantalkin, A., and Tal, O. 2012, *The Canonization of the Pentateuch: When and Why?* Tel Aviv University: Walter de Gruyter.
Fleming, M.I.D.A. (Org.). 2015, Perspectivas da arqueologia romana provincial no Brasil. São Paulo, Annablume, FAPESP.
Featherstone, D., and Painter, J. 2013, *Spatial Politics. Essays for Doreen Massey*. Oxford: Willey-Blackwell.
Fedele, A., Labate, D. 2013, Due lucerne con rare scene erotiche dalle necropoli di Modena romana: tra ritualità della morte e umorismo della vita. In *Pagani e Cristiani XII*, 125-136.
Fedele, A., Labate, D. 2014, Lucerne con scene erotiche dalle necropoli di Modena Romana. *Atti e Memorie, Serie XI, Vol. XXXVI*. Modena: Aedes Muratoriana, 267-285.
Fedele, A., Labate, D. 2013, Una rara lucerna con scena erotica e iscrizione da *Forum popoli*. *Forlimpopoli Document e Studi XXIV*, 65-78.
Figuers, P. 2013, The Pagan Image of Greco-Roman Palestine and Surrounding Lands. *BAR International Series 2495.*
Fink, O. 1900, Formen und Stempel römischer Tonlampen, *Sitzungsberichte der bayerischen Akademie der Wissenschaften* 5: 685-703.
Fischbacj, O. 1986. *Römische Lampen aus Poetovio Mitteilungen des Historischen Vereins für die Steiermark* 44.
Fitzmyer, J. A. 1979, *A Wandering Aramean Collected Aramaic Essays*. Society of Biblical Literature, Monograph series, number 25. California: Scholars Press Chico.
FitzPatrick, E. A. 1993, *Soil microscopy and micromorphology*. New York: John Wiley & Sons.
Flaig, E. 2003, Ritualisierte Politik: Zeichen, Gesten und Herrschaft im Alten Rom. Göttingen.
Fotiadi, P. 2011, Ritual Terracotta Lamps with Representations of Sarapis and Isis from the Sanctuary of the Egyptian Gods Marathon: the Variation of "Isis with Three Ears of Wheat". *Bibliotheca Isiaca, II*, 65-77.
Frahm, E., M. Nikolaidou., and Kelly-Bucellati, M. 2008, Using image analysis software to correlate sherd scans in the field and x-ray element maps in the laboratory. *Bulletin of the Society for Archaeological Sciences 31*:8-12.
Frankel, R. 1999, *Wine and Oil Production in Antiquity in Israel and Other Mediterranean Countries*. Sheffield: Sheffield Academic Press Ltd.
Frecer, R. 2013, Roman Lamps of Gerulata and Their Role in Funeral Rites. *Archeológia 23*, 51-60.
Frecer, R. 2014, A Unique Roman Upper Lamp Mold from Brigetio. *Archeológia 24*, 127-132.
Freestone, I. C. 1995, The Petrography examination of Ceramics. *AM J Archaeol 99 (1)*, 111-115.

Fullford, M., and Tomber, R. 1994, *Excavations at Sabratha 1948-1951, Volume II, The finds, Part 2, The Finewares and Lamps*. London: Society for Libyan Studies Monograph No. 3.
Gal, Z (ed). 2002, Eretz Zafon: Studies in Galilean Archaeology. Jerusalem: Israel Antiquities Authority Publications.
Galliègue, A. 2009, Lampes des nécropoles de Lyon (F). *Instrumenum n. 30*, 46-48.
Garnier, J.F., Sanchez, C., and Chabrié, C. 2009, Les Lampes à Huile des Horrea de L'Agglomération D'Excisum (Eysses, Villeneuve-sur-Lot). *SFECAG, Actes du Congrès de Colmar*, 433-440.
Garnsey, P., Woolf, G. 1989, Patronage of the rural poor in the Roman world. In: Wallace-Hadrill, A. 1989, *Patronage in Ancient Society*. London: Routledge.
Geertz, C. 1973, *The Interpretation of cultures*. New York: Basic Books, Inc., Publishers.
Gil Farres, O. 1947-8, Lucernas romanas decoradas del Museo Emeritense, *Ampurias*, IX-X.
Goffer, Z. 2007, *Archaeological Chemistry*. Hoboken, New Jersey: John Willley & Sons, Inc, 2nd ed.
Goldman, H. 1950, "The Lamps". In *Excavations at Gozly Kule Tarsus, the Hellenistic and Roman Periods*. Princeton, 84-134.
Goldman, H., Cox, D.H., Harden, D.B. 1953, Excavations at Gözlü, Tarsus, I, the Hellenistic and Roman Periods. *The Journal of Roman Studies, Vol. 43*, 209-210.
Goodman, P.J. 2007, *The Roman City and Its Periphery: From Rome to Gaul*. London: Routledge.
Goren, Y. 1995, Shrines and Ceramics in Chalcolithic Israel: The view through the Petrographic Microscope. *Archaeometry 37, 2*, 287-305.
Goren, Y.1996, The principles of petrographic study of archaeological finds and the application of the method in the archaeology of the Land of Israel. Qadmoniot 112: 107-114 (Hebrew, English summary).
Goren, Y., and Goring-Morris, A.N. 2008, Early Pyrotechnology in the Near East: Experimental Lime-Plaster Production at the Pre-Pottery Neolithic B Site of Kfar HaHoresh, Israel. *Geoarchaeology: An International Journal, Vol. 23, No. 6*, 779-798.
Goren, Y. 2014, The Operation of a Portable Petrographic Thin-Section Laboratory for Field Studies. New York Microscopical Society Newsletter, 1-17.
Goren, Y., Bunimovitz, S., Finkelstein, I., and Na'Aman. 2003, The Location fo Alashiya: New Evidence from Petrographic Investigation of Alashiyan Tablets from El-Amarna and Ugarit. *American Journal of Archaeology, Vol. 107, no. 2*, 233-255.
Goren, Y., Ayalon, A., Bar-Matthews, M., and Schilman, B. 2004, Authenticity examination of the Jehoash Inscription. *Tel Aviv 31*, no.1, 2-?
Goren, Y., Hommsen, H., Finkestein, I., and Na'aman, N. 2009, A Provenance Study of the Gilgamesh Fragment from Megiddo. *Archaeometry 51*, 763-773.
Goren, Y., Gurwin, S., and Arie, E. 2014, Messages impressed in clay: Scientific study of Iron Age Judahite bull from Jerusalem. In: Torres-Martinón, M (ed). 2014, *Craft and science: International perspectives on archaeological ceramics*. London: UCL Qatar Series in Archaeology and Cultural Heritage.
Goren, Y. Goldberg, P., Stahl, P.W., and Brinker, U.H. 1991, News and Short Contributions. *Journal of Field Archaeology, Vol. 18, no. 1*, 131-140.
Goren, Y., Gopher, A., and Goldberg, P. 1993, The Beginnings of Pottery Production in the Southern Levant: Technological and Social Aspects. In: Biran, A., and Aviram, J (eds). 1993, *Biblical Archaeology Today, 1990, Proceedings of the Second International Congress on Biblical Archaeology*. Jerusalem: Israel Exploration Society.
Goren, Y., Finkelstein, I., and Na'aman, N. 2004, *Inscribed in Clay, Provenance Study of the Amarna Letters and other Ancient Near Eastern Texts*. Tel Aviv: Tel Aviv University/Institute of Archaeology.
Goren, Y., Finkelstein, I., and Na'aman, N. 2002, Petrographic Investigation of the Amarna Tablets. *Near Eastern Archaeology 65, 3*, 196-206.
Gorzalczany, A. 2006. Petrographic Analysis of the Pottery from Nahal Tut. 'Atiqot. ????????
Graham, A. 1902, *Roman Africa, An Outline of the History of the Roman Occupation of North Africa*. London: Longmans, Green, and Co.
Grandjouan, C. 1961, *The Athenian Agora, Volume VI, Terracottas and Plastic Lamps of the Roman Period*. Princeton, New Jersey: American School of Classical Studies at Athens.
Grassi, E., Airoldi, F. 2011, I corredi: ceramiche e lucerne. In: Siena, S.L.S., Rossignani, M.P., and Sannazaro, M. 2011, *L'abitato la necropoli il monastero, Evoluzione di un comparto del suburbio milanese alla luce degli scavi nei cortili dell'Università Cattolica*. Milano: Vita e Pensiero.

Grawehr, M. 2011, The Roman Lamps of Nabatean Petra. In: In: Frangié, D., and Salles, J.F. 2011, *Lampes Antiques du Bilad es Sham. Jordanie, Syrie, Liban, Palestine*. Paris: De Boccard.
Griffiths, D. 2003, Petrographic Analysis of Middle Bronze Age Burial Jars from Sidon. *Archaeology & History in Lebanon*, 17-21.
Grim, R. E. 1968, *Clay Mineralogy*. New York: Mac-Graw-Hill Book Company.
Guarinello, N.L. 2010, Ordem, Integração e Fronteiras no Império Romano: Um Ensaio. São Paulo: Universidade de São Paulo.
Guarinello, N.L. 2014, Ensaios sobre História Antiga. São Paulo: Universidade de São Paulo, Livre-docência.
Hall, J.K., Krasheninnikov, V. A., Hirsch, F., Benjamini, C., and Flexer, A. 2005, *Geological Framework of the Levant, Volume II: The Levantine Basin and Israel.* Jerusalem: Historical Productions-Hall
Harris, W.V. 1980, Roman Terracotta Lamps: The Organization of an Industry. *The Journal of Roman Studies*, Vol. 70, 126-145.
Harris, W.V. 1993, The Inscribed Economy, Production and distribution in the Roman empire in the light of *instrumentum domesticum*. *Journal of Roman Archaeology, Supplementary Series Number 6*.
Hayes, J.W. 2001, "Lamps". In Stirling, L.M., Mattingly. D.J., and Ben Lazreg, N. 2001. Leptiminus (Lamta), report no. 2. The East Baths, cemeteries, kilns, Venus mosaic, site museum, and other studies. *JRA Suppl*. 41, 202-205.
Halbwachs, M. 1950, Memória Coletiva. Tradução: Laurent Léon Schaffter, 1990, São Paulo: Edições Vértice.
Hales, S., Hodos, T. 2014, Material Culture and Social Identities in Ancient World. Cambridge/New York: Cambridge University Press.
Henderson, J. 2000, The Science and Archaeology of materials: an investigation of inorganic materials. London: Routledge.
Hershkovitz, M. 2003, Lamps Decorated with Human Faces from the Excavations at the Jewish Quarter in Jerusalem. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Herz, N., Garrison, E.G. 1998, *Geological Methods for Archaeology*. Oxford: Oxford University Press.
Hirschfeld, Y. 2004, *Excavations at Tiberias, 1989-1994*. Jerusalem: Israel Antiquities Authority.
Hodder, I. 1992, *Theory and Practice in Archaeology*. London: Routledge.
Horden, P., and Purcell, N. 2000, *The Corrupting Sea. A Study of Mediterranean History*. London: Blackwell Publishing.
Horden, P. and Purcell, N. 2006, The Mediterranean and "the New Thalassology". *American Historical Review*, 723-740.
Howgego, C., Heuchert, V., and Burnett, A. 2005, Coinage and Identity in the Roman Provinces. Oxford: Oxford University Press.
Hull, R. 2009, Jews and Judaism in African History. Princeton: Markus Wiener Publishers.
Humphrey, J.H. 1978, *Excavations at Carthage 1975, Conducted by the University of Michigan, Volume II*. Ann Arbor: The University of Michigan.
Humphrey, J.H. 1978, *Excavations at Carthage 1976, Conducted by the University of Michigan, Volume IV*. Ann Arbor: The University of Michigan.
Humphrey, J.H. 2002, The Roman and Byzantine Near East, volume 3. Portsmouth, Rhode Island: *Journal of Roman Archaeology*.
Humphrey, J.H (ed). 1988, *The Circus and a Byzantine Cemetery at Carthage, Volume I*. Ann Arbor: The University of Michigan Press.
Humphrey, J.H. 1995, The Roman and Byzantine Near East: Some Recent Archaeological Research. *Journal of Roman Archaeology, Supplementary Series 14*.
Humphrey, J.H. 2009, Studies on Roman Pottery of the Provinces of Africa Proconsularis and Byzacena (Tunisia). *Journal of Roman Archaeology, Supplementary Series 76*.
Hurt, T.D., and Rakita, G.F. 2001, *Style and Function, Conceptual Issues in Evolutionary Archaeology*. London: Bergin & Garvey.
Insoll, T. 2004, *Archaeology, Ritual, Religion*. London: Routledge.
Insoll, T. 2011, Sacrifice. In: Insoll, T. (ed). 2011, *The Oxford Handbook of Archaeology of Ritual and Religion*. Oxford: Oxford University Press.
Issac, B., and Roll, I. 1982. Roman Roads in Judaea I, The Legio-Scythopolis Road. *BAR International Series 141*.
Istenic, J., Daszkiewicz, M., and Schneider, G. 2003, Local Production of Pottery and Clay Lamps at *Emona* (Italia, Regio X). *Rei Cretariae Romanae Favtorum Acta* 38, 83-91.
Iványi, D. 1935. *Die Pannonische Lampen*. Dissecrationes Pannonica 2, No. Budapest: Sárkány

Iványi, D. 1938, Die Pannonische Lampen. *The Journal of Roman Studies, Vol. 28, part 1*, 101-103.
Jakoel, E. 2013, Tombs and Burial in Jaffa (Joppa) during the Roman Period (1st Century BCE - 4th Century CE). Tel Aviv University, Unpublished MA thesis.
James, E.O. 1958, *Myth and Ritual in the Ancient Near East, An Archaeological and Documentary Study*. New York: Frederick A. Praeger.
Johnson, M. 2010, Concepções em Agência em Interpretação Arqueológica. *Vestígios, Revista Latino-Americana de Arqueologia Histórica, Vol. 4, n. 2*, 149- 173.
Joly, E. 1974, *Lucerne del Museo di Sabratha*. Roma: L'erma di Bretschneider.
Joly, E., Garraffo, A., Mandruzzato. 1992, Materiali minori dallo scavo del teatro di Leptis Magna. *Quaderni di Archeologia della Libia, 15*. Roma, 25-233.
Joly, E. 1995, Lucerne con riflecttore del Museum Greco-Romano di Alessandia. In *Alessandiria e il Mondo Ellenistico-Romano I Centenario del Museo Greco-Romano Alessandia, 23-27 Novembre 1992*, Roma, 329-332.
Jones, A. 2007, *Memory and Material Culture*. Cambridge: Cambridge University Press.
Jones, S. 1997, *The Archaeology of Ethnicity: Constructing identities in the past and present*. London: Routledge.
Kahane, P.P. 1952, Pottery Types from the Jewish Ossuary-Tombs around Jerusalem II. *IEJ 2*, 176-182.
Kahane, P.P. 1961, Tombs at Huqoq. Notes on the Finds. *'Atiqot (ES) 3*, 128-147.
Kapur, S., Mermut, A., and Stoops, G (eds). 2008, *New Trends in Soil Micromorphology*. Berlin: Springer-Verlag.
Karivieri, A. 1998, The Athenian Lamp Industry and Lamp Trade from the Fourth to the Sixth Century. *Study di Antichità Cristiana Pubblicati a Cura del Pontificio Istituto di Archeologia Cristiana LIV, Supl. vol. 87-89*, 421-428.
Karivieri, A. 1999, *Statistical Aspects on Lamp Distribution: Athens, Corinthia, ca. 200-550 AD*. Sonderdruck as Mitteilungen des Deutschen Archäologischen Instituts Athenische Abteilung, Band 114. Mainz: Verlag Philipp von Zabern.
Karivieri, A. 2003, Lychnological News from the Museum of Antiquities at Lund University. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Katsioti, A. 2008, Aspects of the economic and commercial activity of Rhodes during late antiquity: The case of lamps. In: Papageorgiadou-Banis, C., Angeliki, G. (eds). *Sailing un the Aegean, Readings on the economy and trade routes*. Paris: Diffusion de Boccard.
King, C. 2003, The Organization of Roman Religious Beliefs. *Classical Antiquity vol. 22, no. 2*, 271-312.
Katsioti, A. 2014, The Circulation of Cypriot Lamps in Late Roman Early Byzantine Rhodes, Greece. ΕΥΛΙΜΕΝΗ ΣΕΙΡΑ ΑΥΤΟΤΕΛΩΝ ΕΚΔΟΣΕΩΝ 2, 153-165.
Khader, A.B.A-B., and Bonifay, M. 2000, La Céramique de L'Édifice des Asclépeia à Thuburbo Majus (Tunise). *Antiquités africaines, t.34*, 231-249.
Kloner, A. 1988. "The Roman Amphitheater at Beth Guvrin Preliminary Report, " IEJ 38: 15-24.
Kloner, A., and Hübsch,A . 1996. "The Roman Amphitheater of Bet Guvrin: A Preliminary Report on the 1992, 1993, and 1994 Seasons," 'Atiqot 30:101-102, fig. 25.
Knappet, C., and Malafouris, L. 2008, *Material Agency, Towards a Non-Anthropocentric Approach*. New York: Springer.
Knowles, K. 1994, "The lamps". In: Fulford, M.G., and Peacock, D.P.S. (eds.), *Excavations at Carthage, The British Mission, vol. II.2*. The circular harbour, north side. The pottery. London, 23-41
Kogan-Zehavi, E. 2012, Tombs and Installations from the Iron Age II to the Byzantine Period from South Horbat Tittora. *'Atiqot 72*, 13-92 (Hebrew)
Koselleck, R. 2000, *Estratos do Tempo. Estudos sobre História*. Trad. Markus Hediger, Rio de Janeiro: Contraponto Editora Ltda.
Koutoussaki, L. 2008, Lampes D'Argos, *Les lampes en terre cuite découvertes dans L'Agora et Les Thermes Campagnes de Fouilles 1972-1991*. Unpublished PhD thesis, Université de Fribourg, Suisse.
Kovac, M. 2014, Experimental workshop: the making of Roman ceramic lamps at the Museum of Slavonia Osijek. In: Vrkljan, G. L., Siljeg, B., Roguljic, I. O., and Konestra, A. 2014, *Roman Poterry and Glass Manufactures Production and Trade in the Adriatic Region*. Crikvenica: Institut Za Arheologiju Muzej Grada Crikvenice.
Krasheninnikov, V. A., Hall, J.K., Hirsch, F., Benjamini, C., and Flexer, A. 2005, *Geological Framework of the Levant, Volume I: Cyprus and Syria*. Jerusalem: Historical Productions-Hall.

Krause, M.F.M. 2003, Lampes des IIe et IIIe S. de la domus Tiberiana (Rome, Palatin). In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices
Lapp, E.C. 1997, *The Archaeology of Light: The Cultural Significance of the Oil Lamp from Roman Palestine*. Unpublished PhD theses, Duke University.
Lapp, E.C. 2006/2007, Marketing Religious Difference in Late Antique Syria-Palestine: Clay Oil Lamps as Clientele Indicators. In: Edwards, R., and Mccullough, C. T. (eds.) 2006/2007, The Archaeology of Difference. Gender, Ethnicity, Class, and the "Other"in Antiquity: Studies in Honor of Eric. M. Meyers. *Annual of the American Schools of Oriental Research 60/61*. Boston, 371-380.
Lapp, E.C. 2012, A Water Absorption Analysis of Nabatean, North African and Other Clay Lamp Fabrics Unearthed at The Red Sea Port of Roman Aila (Aqaba, Jordan). *Archaeometry 54, 1*, 56-79.
Lavan, L., Bowden, W. 2003, *Theory and Practice in Late Antique Archaeology*. Leiden/ Boston: Brill.
Lefebvre, H. 1974, *From the Production of Space*. trans. Donald Nicholson-Smith. Cambridge: Blackwell, 1991.
Leibner, U. 2009, *Settlement and History in Hellenistic, Roman, and Byzantine Galilee: An Archaeological Survey of Eastern Galilee*. Tubingen: Mohr Siebeck.
Leibundgut, A. 1997, Die römischen Lampen in der Schweiz. Bern: Francke Verlag.
Levine, L.I. 2002, *Jerusalem, Portrait of the City in the Second Temple Period (538 B.C.E. - 70 C.E.)*. Philadelphia: The Jewish Publication Society.
Leglay, M. 1971, "Circonscription de Rhône-Alpes" in *Gallia, Tome 29, fascicule 2*, 407-445.
Leglay, M. 1973, "Circonscription du Rhône-Alpes" in *Gallia, Tome 31, fascicule 2*, 515-547.
Levine, L. I. 2005, *The Ancient Synagogu*e. New Haven & London: Yale University Press.
Lewit, T. 2011, Dynamics of fine ware production and trade: the puzzle of supra-regional exporters. *Journal of Roman Archaeology, Vol. 24*, 313-333.
Livingood, P.C. and A.S. Cordell 2009, Point/counter point: the accuracy and feasibility of digital image techniques in the analysis of ceramic thin-sections. *Journal of Archaeological Science 36*:867-872.
Loeschcke, S. 1919, *Lampen aus Vindonissa*. Zürich: Kommission bei Beer & Cie.
Loffreda, S. 2002, Holy Land Pottery at the Time of Jesus: Early Roman Period. 63 BC-70 AD. Jerusalem: Franciscan Printing Press, 70-72.
Lombardi, R. G. 2012, Produzione e diffusione delle lucerne africane tardoantiche nell'insendiamento rurale di Seppannibale. (Fasano-BR). In: Chrzanoviski, L (ed). 2012, *Lychnological Acts 3, (Actes du 3e Congrès International d'études sur le luminaire antique, Université d' Heidelberg 21-26.IX.2009).* Montagnac: Éditions Monique Mergoil.
Mackenzie, W.S., Donaldson, C.H., and Guilford, C. 1981, *Atlas of igneous rocks and their textures*. London: Longman Group UK, Longman Scientific & Technical.
Mackenzie, W.S., Guilford, C. 1980, *Atlas of rock-forming minerals in thin section*. London: Longman Group UK, Longman Scientific & Technical.
Mackensen, M. 1993, Die spätantiken Sigillata - und Lampentopfereien von El Mahrine (Nordtunesien). München: Beck.
Mackensen, M. 1993, Die spätantiken Sigillata - und Lampentopfereien von El Mahrine (Nordtunesien). München: Beck.
Mackensen, M., and Schneider, G. 2002, Production Centres of African Red Slip Ware (2nd- 3rd c.) in Northern and Central Tunisia : Archaeological Provenance and Reference Groups Based on Chemical Analysis. Journal of Roman Archaeology 19, 163-190.
Mackensen, M., and Schneider, G. 2006, Production Centres of African Red Slip Ware (2nd-3rd c.) in Northern and Central Tunisia : Archaeological Provenance and Reference Groups Based on Chemical Analysis. Journal of Roman Archaeology 19, 163-190.
Magen, Y. 2008, *Judea and Samaria Researches and Discoveries*. Jerusalem: Israel Antiquities Authority.
Maggetti, M., Messiga, B. 2006, *Geomaterials in Cultural Heritage*. London: The Geological Society Publishing House.
Maia, M.G. P., and Maia, M. 1997, *Lucernas de Santa Bárbara*. Castro Verde: Edição Cortiçol.
Maniatis, Y., Jones, R.E., Whitbread, I.K., Kostikas, A., Simopoulos, A., Karakalos, Ch. and Williams, C.K. 1984, Punic Amphoras Found at Corinth, Creece: An Investigation of Their Origin and Technology. *Journal of Field Archaeology, vol. 11, n.2*, 205-222.
Manniez, Y. 1991-1992, La céramique gallo-romaine tardive de la nécropole des Clapiès à Villeneuve-lès-Béziers (Hérault). *Études sur l'Hérault, N.S. 7-8*, 27-32.

Manniez, Y. 2005, Les lampes à huile dans les sépultures romaines tardives du Languedoc méditerranéen. In: Chrzanoski, L. (ed). Lychnological Acts 1. Actes du ler Congrès international d'études sur le luminaire antique (Nyon-Genève). Montagnac: Éditions Monique Mergoil.
Marini, S. 2012, Sigillata italica, sigillata africana e lucerne dal museo di Rosignano Marittimo. The *Journal of Fasti Online*. Roma: Associazione Internazionale di Archeologia Classica.
Martín, F.G. R. 2002, Lucernas Romanas del Museo Nacional de Arte Romano (Mérida). Madrid: Grafo S.A.
Martín, F.G.R. 2003, Las lucernas romana de la villa de Torre Águila: Las marcas de alfarero. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Martin Nagy, R. et al (ed). 1996, *Sepphoris in Galilee: crosscurrents of culture.* Raleigh, N.C.: North Carolina Museum of Art.
Massey, D. 1994, *Space, Place and Gender*. Minneapolis: University of Minnesota Press.
Massey, D. 2005, *For Space*. London: SAGE Publications Inc.
Massey, D. 2009. *The possibilities of a politics of place beyond place?* A conversation with Doreen Mossey. Sottish Geographical Journal, 125 (3-4), 401-420.
May, T. 1930. *Catalogue of the Roman pottery in the Colchester and Essex Museum*. Cambridge: Borough of Colchester.
Mazor, G., and Najjar, A. 2007, Nysa-Scythopolis: The Caesareum and the Odeum. Bet She' an Archaeological Project 1986-2002, Bet She'an I. Jerusalem: *Israel Antiquities Authority Reports No. 33*.
McCallum. M. 2011, Pottery production in Pompeii: an Overview. In: Poehler, E., Flohr, M., Cole, K. 2011, *Pompeii, Art Industry and Infrastructure*. Oxford: Owbow Books.
Meeks, W. A., and Wilken, R.L. 1978, Jews and Christians in Antioch in the First Four Centuries of the Common Era. Ann Arbor: The Society of Biblical Literature.
Mehrer, M.W., Wescott, K. L. 2006, GIS and Archaeological Site Location Modeling. London: Taylor & Francis.
Mentovich, E. D., Schreiber, D.S., Goren, Y., Kahanov, Y. and Goren, H. Cvikel, D., Ashkenazi, D. 2010, New insights regarding the Akko 1 shipwreck: a metallurgic and petrographic investigation of cannonballs. *Journal of Archaeological Science 37*, 2520-2528.
Menzel, H. 1953. Lampen in römischen Totenkult, in (No. ed.), Festschrift des RGZM zur Feier seines hundertjährigen Bestehens 1952: 131-138. Mainz: Verlag RGZM.
Merrills, A.H. 2004, *Vandals, Romans and Berbers, New Perspectives on Late Antique North Africa*. Aldershot: Ashgate Publishing Limited.
Merrony, M. 2013, *Socio-Economic Aspects of Late Roman Mosaic Pavements in Phoenicia and Northern Palestine*. BAR International Series 2430.
Meskell, L., and Preucel, R. W. 2007, *A Companion to Social Archaeology*. Oxford: Blackwell Publishing.
Michelucci, M 1998, Un nuovo deposito di lucerne dalla agora di lasos. In: *AA. VV., In memoria di Enrico Paribeni*, Roma, 295-304.
Middleton, A., and Freestone, I. 1997, Recent Developments in Ceramic Petrology. London: British *Museum Occasional Papers no. 81*.
Millar, F. 1992, The Roman Near East 31 BC - AD 337. Harvard University Press.
Middleton, A. 1997, Ceramic Petrography. *Rev. do Museu de Arqueologia e Etnologia, São Paulo, Suplemento 2*, 73-79.
Mikati, R.M. S. 1998, The AUB Beirut Souks Excavations 1994-95, The Terracotta Lamps. Unpublished MA thesis, American University of Beirut.
Mikati, R.M.S. 2001-2002, Chronological, Functional and Spatial Aspects in Lamp Studies: The Roman Bath Lamps, BEY 045.*ARAM Periodical , 13-14*, *Beirut: History and Archaeology & Water in the Pre-Modern Near East*, 281-292.
Mikati, R.M.S. 2003, Faustus the Early Roman Lamp Maker Visits Beirut Evidence of a Tyre-based Prodcution. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Miller, D., Jackson, P., Thrift, N., Holbrook, B., and Rowlands, M. 1998, *Shopping, Place and Identity*. London/New York: Routledge.
Mlynarczyk, J. 1980, *The Paphian Sanctuary of Apollo Hylate*s. Nicosia-Cyprus: Report of the Department of Antiquities Cyprus.
Mlynarczyk, J. 1984, *Remarks on the Temple of Aphrodite Raphia in Nea Paphos in the Hellenistic Period*. Nicosia-Cyprus: Report of the Department of Antiquities Cyprus.

Mlynarczyk, J. 1992, Fourth Century A. D. Terracotta Lamps from Nea Paphos. In: Aström, P. (ed). 1992, *Acta Cypria, Acts of an international Congress on Cypriote Archaeology held in Göteborg on 22-24 August 1991, Part 2*. Tonsured: Paul Aströms Förlag.
Mlynarczyk, J. 1995, New Data on the Chronology of Late Roman Lamps in Alexandria. Centre D' Archéologie Méditerranéenne de L'Académie Polonaise des Sciences, Etudes el Travaux XVII, 134-175.
Mlynarczyk, J. 1998, Italian and Alexandrian Terracotta Lamps. A Pattern of Influence (the 1st through 4th Century A.D.). In: Bonacasa, N., Naro, M.C., Portale, E.C. and Tullio, A. 1998, *L'Egitto in Italia Dall'antichità al Medioevo, Atti del III Congresso Internazionale Italo-Egiziano Roman, CNR - Pompei, 13-19 Novembre 1995*. Roma: Consiglio Nazionale Delle Ricerche.
Mlynarczyk, J. 2004, Between Phoenicia and Galilee: Kitchen Pottery from Hellenistic Deposits at Sha'ar Ha-Amakim. in ΣΤ΄Συνάντηση, pp. 631–640
Mlynarczyk, J., Burdajewicz, M. 2005, North-West Church in Hippos (Sussita), Israel: Five Years of Archaeological Research (2000-2004). *ECA 2*, 39-58.
Mlynarcvk, J. 2011, The fading lights of a church. In: Frangié, D., and Salles, J.F. 2011, *Lampes Antiques du Bilad es Sham. Jordanie, Syrie, Liban, Palestine*. Paris: De Boccard.
Mlynarcvk, J. 2013, Terracotta Oil Lamps from Qumran: The Typology. *RB. T. 1201-1*, 99-133.
Mlynarczyk, J., and Burdajewicz, M. 2013, The Northwest Church Complex. In: Segal, A., Eisenberg, M., Mlynarczyk, J., Burdajewicz, M., and Schuler, M., 2013, *Hippos-Sussita of Decapolis. The First Twelve Seasons of Excavations 2000-2011. Volume I*. Haifa: Rahash, Bar-Lev Industrial Park.
Mor, M., Oppenheimer, A., Pastor, J., and Schwartz D. R. 2003, *Jews and Gentiles in the Holy Land in the Days of the Second Temple, the Mishnah and the Talmud. A collection of articles*. Jerusalem: Yad Ben-Zvi Press.
Morais, R. 2011, *A colecção de Lucernas Romanas do Museu de Évora*. Coimbra: Imprensa da Universidade de Coimbra.
Morales, J. A. M., and Catalán, A. M. 2014, Evidencias de la fabricación de lucernas en la ciudad romanorrepublicana de La Cabañeta (El Burgo de Ebro, Zaragoza). In: Morais, R., Fernández, A., Sousa, M.J. 2014, *As Produções cerâmicas de imitação na Hispania. Tomo I*. Monografias Ex Officna Hispana II. Porto: Faculdade de Letras da Universidade do Porto.
Moreira, R.A., Carlan, C.U., Funari, P.P. A., 2015, *Iconografia e Semiótica, Uma abordagem Histórica*. São Paulo: Fapesp/ Annablume.
Morillo Cerdán, A. 1990, En torno a la tipologia de lucernas romanas: problemas de nomenclatura. *CuPAUAM 17*, 143-167.
Morillo Cerdán, A. 1992, La producción de Vogelkopflampen de Herrera de Pisuerga (Palencia, España). Un testimonio revelador de la política militar augustea en la Península Ibérica. *Opus 11*, 115-133.
Morillo Cerdán, A. 1999, *Lucernas romanas en la región septentrional de la península ibérica. Contribución al conocimiento de la implantación romana en Hispania*. Editions Monique Mergoli: Montagnac.
Mouterde, R. 1957, "Reliefs et inscriptions de la Syrie et du Liban, II., Autel de Beyrouth orné d'un relief de dieu solaire," in MUSJ 34, 213–214; W. van Rengen, "L'épigraphie grecque et latine de Syrie: Bilan d'un quart de siècle de recherches épigraphiques," in Haase and Temporini, ANRW, II,8, p. 51.
Mulder-Hymans, N. 2001-2002, The "Egg Shell-Thin" Oil Lamps from the Souk of Beirut. *ARAM Periodical , 13-14*, *Beirut: History and Archaeology & Water in the Pre-Modern Near East*, 265-280.
Nardy, A.J.R., Machado, F.B. 2002, *Mineralogia Óptica: Óptica Cristalina*. Rio Claro: UNESP.
Nasrallah, L., Bakirtzis, C., and Friesen, S.J (eds). 2011, From Roman to Early Christian Thessalonike. Studies in Religion and Archaeology. *Harvard Theological Studies 64*: Harvard University Press.
Neidinger, W. 1982, A Typological of oil lamps from the mercantile quarter of Antipatris. Journal of Tel Aviv University 9.
Negev, A. 1971, The Nabatean Necropolis of Memphis (Kurnub). *IEJ 21*: 110-129.
Negev, A. 1974, The Nabatean Potter's Workshop at Oboda. Acts Rei Creatariae Romanae autorum. Bonn.
Nesse, W. D. 2009, *Introduction to Optical Mineralogy*. Oxford: Oxford University Press.
Neurath, M., Ellis, J. 1965, *They lived like this in ancient Crete*. London.
Norman, N.J. 1988, The Architecture of the Circus. In Humphrey 1988, p. 7-56.

Noujaim Clark, G., Boudagher-Fadel, M.K. 2001, The Larger Benthic Foraminifera and Stratigraphy of the Upper Jurassic/Lower Cretaceous of Central Lebanon. Revue de Micropaléontologie, vol. 44, n.3, 215-232.
Noujaim Clark, G., Boudagher-Fadel, M.K. 2004, Larger benthic foraminifera and calcareous algae of the Upper Kesrouane Limestone Formation (Middle/Upper Jurassic) in Central Lebanon: Stratigraphy, sedimentology and regional synopsis. Genève: Revue de Paléobiologie 23 (2), 477-504.
Nunes, J.D.C., Guerra, A., and Fabião, C. 1990, As Lucernas do Acampamento Militar Romano da Lomba do Canho (Arganil). *Conimbriga, XXIX*, 69-90.
Oleiro, J.M.B. 1952, Catálogo de Lucernas romanas do Museu Machado de Castro. Coimbra.
Oren, E.D. 1982, Excavations at Qasrawet in North-Western Sinai: Preliminary Report. *Israel Exploration Journal, vol. 32, no. 4*, 203-2011.
Orni, E., and Efrat, E. 1973, *Geography of Israel*. Jerusalem: Israel Universities Press.
Overman, J.A., and Schowalter, D.N. 2011, The Roman Temple Complex at Harvat Omrit: An interim report. Oxford: Archaeopress.
Ownby, M.F., and Bourriau, J. 2009. The movement of Middle Bronze Age storage jars: a provenance study based on petrographic and chemical analysis of Canaanite jars from Memphis, Egypt. In: Quinn, P.S. 2009, *Interpreting Silent Artefacts. Petrographic Approaches to Archaeological Ceramics*. Oxford: Achaeopress.
Ownby, M.F., and Griffiths, D. 2009, The Petrographic Analysis of Beach Sand from Sidon to Determine its utility for Ceramic Provenance Studies. Lebanon: *Archaeology & History in the Lebanon*, 56-67.
Ownby, M.F. 2010, *Canaanite Jars from Memphis as Evidence for Trade and Political Relationships in the Middle Bronze Age*. Cambridge, Unpublished PhD thesis University of Cambridge.
Parkins, H., Smith, C. 1998, *Trade, Traders and The Ancient City*. London: Routledge.
Patrich, J. 2011, Studies in the archaeology and history of Caesarea Maritime: caput judaea, metropolis palaestinae. *Ancient Judaism and Early Christianity 77*. Leiden: Brill
Pasolini, C. 1977, Le lucerne fittili romane del Museo Nazionale di Napoli, in Carandini 1977, pp. 33-51.
Peacock, D.P.S. (ed.). 1977, *Pottery and early commerce: Characterization and trade in Roman and later ceramics*. London: Academic Press.
Pedreno, J.C.O. 2000, Las ofrendas votivas de comunidades rurales a Jupiter en Hispania como testimonios de religiosidad indigena. In: *Dialogues d'historie ancienne, vol. 26, n.2*, 63-75.
Pellegrino, E. 2007, Redécouverte de Deux Lampes Provenant de Contextes Funéraires, Complément à L'Étude de Quelques Céramiques Funéraires Trouvées à Menton (06). *Mémoires, Tome XLIX, Institut de Préhistoire et d'Archéologie Alpes Méditerranée*. Nice: Éditions IPAAM, 169-171.
Pereira, C.S. 2008, Lucernas romanas de Scallabis. Dissertação de Mestrado Universidade de Lisboa.
Pereira, C. S. 2012, Lucernas Romanas de Ossonoba (Faro, Portugal), Um contexto ambíguo. *Habis 43*, Universidad de Sevilla,119-147.
Pereira, C.S. 2013, Lucernas Romanas de Alcácer do Sal: entre a prática e o sagrado. *Al-Madan, II Série (17), Tomo 2*, 13-28.
Pereira, C.S. 2014, Reflexiones sobre el decaer del comercio de lucernas romanas en el Occidente Peninsular. *Revista Onoba, No. 2*, 191-206.
Peterson, S. E., and Betancourt, P.P. 2009, *Thin-Section Petrography of Ceramic Materials*. Philadelphia, Pennsylvania: INSTAP Academic Press.
Petrut, D., Gui, M., and Trinca, H. 2014, Lighting Roman Military Barracks. An Interdisciplinary Approach Based on Evidence from Dacia. *Archaeologia Bulgarica XVIIII, 3*, 65-92.
Piranomonte, M. 2010, Religion and Magic at Rome: The Fountain of Anna Perenna. In: Gordon, R.L.; and Simón, F.M (eds). 2010, Magical Practice in the Latin West.Papers from the International Conference held at the University of Zaragoza 30 set-1Oc 2005. Leiden-Boston: Brill.
Poblome, J. 2008, *Ex oriente lux. A panorama of craft studies in the Roman East*. Zeitschrift für. Schweizerische Archäologie und Kunstgeschichte 65, 79-83.
Poblome, J., Bes, P., and Willet, R. 2013, Thoughts on the Archaeological Residue of Networks. A view from the East. In: Keay, S. (ed). *Rome, Portus and the Mediterranean.* Archaeological Monographs of the British School at Rome, British School at Rome.
Podvin, J-L. 2001, Anubis et Isis sur des lampes à huile romaines. À propos d'une terre cuite du musée des Antiquités nationales à Saint-Germain-en-Laye. *Études, Revue du Louvre*, 33-36.
Podvin, J-L. 2003, La triade Isis-Harpocrate-Anubis sur des lamoes africaines. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.

Podvin, J-L. 2005, Lampes d'Anubis seul. In: Chrzanoviski, L. (ed). 2005, *Lychnological Acts 1. Actes du ler Congrès international d'études sur le luminaire antique (Nyon-Genève, 29.IX - 4.X.2003)*. Monogr. Instrument 31. Montagnac: Éditions Monique Mergoil, 263-269, pl. 123-124.
Podvin, J-L. 2008, Le combat de la mangouste et du serpent sur les lampes à huile romaines. In: Roman, C-A., and Gudea, N. 2008, *Lychnological Acts 2, Acts of 2nd International Congress on Ancient and Middle Age Lighting Devices (Zalau - Cluj-Napoca, 13th-18th of May 2006)*. Cluj-Napoca: Editura Mega.
Polito, A. 2003, Lucerne in Sigillata Africana dalle case Romane di Agriento. *Bibliotheca Archaeologica 35, Archeologia del Mediterraneo Studi in Onore di Ernesto de Miro*. L'erma di Bretschneider.
Ponisch, M. 1961, *Les lampes romaines en terre cuite de la Maurétanie tingitane*. Publications du Sevice des Antiquités du Maroc, Rabat. In: Revue archéologique du Centre de la France, Tome 1, fascicule 4.
Pontani, F.M. 2000, *Antologia Palatina, Tutte le poesie d'amore*. Torino: Giulio Einaudi editore s.p.a.
Porat, N. 1989, Composition of Pottery-Application to the Study of the Interrelations between Canaan and Egypt during the Third Millennium B.C. (unpublished Ph.D thesis, Hebrew University of Jerusalem).
Porath, Y. 1995, "Herod's 'amphitheater' at Caesarea: a multipurpose entertainment building. In: Humphrey (ed.), 1995. The Roman and Byzantine Near East: some recent archaeological research, Journal of Roman Archaeology, Supplent Series 14. Ann Arbor: MI, 15-27.
Porto, V. C. 2007, *Imagens Monetárias na Judéia/Palestina sob dominação Romana*. Unpublished PhD thesis, University of São Paulo.
Price, S. 1984, Rituals and Power. The Roman imperial cult in Asia Minor. Cambridge University Press: Cambridge.
Price, S. 2012, Religious Mobility in the Roman Empire. *Journal of Roman Studies, vol. 102*, 1-19.
Provoost, A. 1976, Les lampes antiques en terre cuite: introduction et essai de typologie générale avec des détails concernant les lampes trouvées en Italie, *L'Antiquité classique* 45: 5-39.
Quinn, P.S. 2009, *Interpreting Silent Artefacts. Petrographic Approaches to Archaeological Ceramics*. Oxford: Achaeopress.
Quinn, P.S. 2013, *Ceramic Petrography. The Interpretation of Archaeological Pottery & Related Artifacts in Thin Section*. Oxford: Archaeopress.
Raban, A. 1989, Volume I: The Site and the Excavations. In: Oleson, J. P. (ed), 1989, The Harbours of Caesarea Maritima. Results of the Caesarea Ancient Harbour Excavation Project, 19980-1985. *BAR International Series 491*.
Rabello, A.M. 1987, The Legal Condition of the Jews in the Roman Empire Based on Jean Juster's Les Juifs dans l'empire romain. Jerusalem, pp. 53–55, n. 217 (Hebrew).
Raith, M. M., Raase, P., and Reinhardt, J. 2011, Guide to Thin Section Microscopy. 107 pp. e-Book ISBN 978-3-00-033606-5 (PDF).
Ramalho, J. 2013, *Eusebio e Constantino. O início de uma Igreja Imperialista*. São Paulo: Fonte Editorial.
Rapp, G. 2009, *Archaeomineralogy*. Berlin/Heidelberg: Springer-Verlag.
Rebuffat, R. 1987. "Lampes romaines à Gholaia (Bu Njem, Libye)". In Oziol, Th., and Rebuffat, R., 1987, *Les lampes de terre cuite en Méditerranée. Des origines à Justinien*. Lyon, 83-90.
Reedy, C. L. Kamboj, S. 2003, Comparing comprehensive image analysis packages: research with stone and ceramic thin sections. In: Merritt, J. (ed). *Development of Web-accessible Reference Library of Deterred Fibers Using Digital Imaging and Image Analysis*. National Park Service, Harpers Ferry, 159-166.
Reedy, C. L. 2006, Review of digital image analysis of petrographic thin sections in conversation research. *Journal Am. Inst. Converv. 45*, 127-146.
Reedy, C.L. 2008, *Thin-Section Petrography of Stone and Ceramic Cultural Materials*. London: Archetype Publications.
Reedy, C.L., Anderson, J., Reedy, T.J., and Liu, Y. 2014, Image Analysis in Quantitative Particle Studies of Archaeological Ceramic Thin Sections. *Advances in Archaeological Practice 2(4)*, 252-268.
Renfrew, C., Scarre, C. 1998, Cognition and Material Culture: the Archaeology of Symbolic Storage. Cambridge: MacDonald Institute for Archaeological Research, University of Cambridge.
Reyniers, C. F. 1965, Lampes inédites de Tunisie (Hamman ez Zouakra et Oudna). *Revue archéologique du Centre, volume 4, n.3*, 209-236.
Reynolds, P. 2010, "Trade networks of the East, 3rd to 7th centuries: the view from Beirut (Lebanon) and Butrint (Albania)(fine wares, amphorae and kitchen wares). In: Menchelli, S, Santoro, S., Pasquinucci, M., and Guiducci, G (eds). 2010, LRCW3. Late Roman coarse wares, cooking wares and amphorae in the Mediterranean. Oxford: *BAR S2185*.

Rice, P. M. 1987, *Pottery Analysis: A Sourcebook*. Chicago/London: The University of Chicago Press.
Richard, C. J. 2010, Why We're All Romans. The Roman Contribution to the Western World. Washington, DC: Rowman & Littlefield Pubishers Inc.
Rich, J., and Shipley, G. 1993, *War and Society in the Roman World*. London: Routledge.
Richard, C.J. 2010, *Why We're All Romans. The Roman Contribution to the Western World*. Lnham: Rowman & Littlefield Publishers Inc.
Ribeiro Machado, C.A. 2011, Roman Aristocrats and the Christianization of Rome. In: Lizzi Testa, R., and Brown, O. *Pagans and Christian in the Roman Empire: The Breaking of a Dialogue*. Munster: Lit-Verlag, 493-516.
Ribeiro Machado, C.A. 2012, Between Memory and Oblivion: The End of the Roman Domus. In: Beharwald, R., and Witschel, C. (ed). *Rom in der Spätantike, Historische Erinnerung im städtischen Raum*. Hedelberg: Frans Steiner Verlag.
Rivers, J.B. 1995, *Religion and Authority in Roman Carthage from Augustus to Constantine*. Oxford: Clarendon Press.
Rivet, L. 2004, Lampes à huile et céramiques à parois fines de l'atelier de potiers gallo-romain de l'agglomération portuaire de Fos-sur-Mer (Bouches-du-Rhône). *Revue archéologique de Narbonnaise, Tome 37*, 233-257.
Rizakis, A. D., Camia, F. 2008, Pathways to Power. Civic Elites in the Eastern Part of the Roman Empire. *TRIPODES 6*. Atene: Scuola Archaeologica Italiana di Atene.
Robertson, E.C., Seibert, J.D., Fernandez, D.C., and Zender, M.U.(eds) 2006, *Space and Spatial Analysis in Archaeology*. Calgary: University of Calgary Press.
Roediger, H.L. 2013, Applying cognitive psychology to education: Translational educational science. *Psychological Science in Public Interest, 14*(1), 1-3.
Rohrlich, V., and Goldsmith, V. 1984, Sediment Transport along the Southeast Mediterranean: A Geological Perspective. *Geo-Marine Letters*, 4:99-103.
Roll, I., and Tal, O. 1999, Apollonia-Arsuf. Final Report of Excavations. Tel Aviv.
Rolland, H. 1962, "Circonscription d'Aix-en-Provence (région nord)", in *Gallia, Tome 20, fascicule 2* (vol. 20, n. 20-2), 655-685.
Rolland, H. 1964, "Aix-en-provence (région nord)"in *Gallia, Tome 22, fascicule 2,* (vol. 22, n. 22-2), 545-568.
Roma, G. 2012, Uso e trasformazione degli spazi cultuali tra paganesimo e cristianesimo. In: De Santis, A. C-P., 2012, *Martiri, santi, patroni: per una archeologia della devozione. Atti X Congresso Nazionale di Archeologia Cristiana, Tomo I*. Università della Calabria, 87-106.
Roma, G. 2014, *Lo Spazio del Sacro nella cultura del Mediterraneo*. I Santuari e il Mare. Atti del III Convegno Internazionale Santuario Santa Maria di Monte Berico Vicenza, 15-17 aprile 2013. Bari: Edipuglia.
Rosenfeld, B. Z. 2010, Torah Centers and Rabbinic Activity in Palestine 70-400 CE. History and Geographic Distribution. *Supplements to the Journal for the Study of Judaism 138*. Leiden: Brill.
Rosenthal, R., and Sivan, R. 1978, Ancient Lamps in the Schloessinger Collection. *QEDEM 8*, Monographs of Institute of Archaeology, The Hebrew University of Jerusalem.
Rosssiter, J. 1988, "Lamps from the late-4th to early-5th century deposit". In: Humphrey, J.H. (ed.) 1988, *The circus and a Byzantine cemetery at Carthage, vol. I*. Ann Arbor, MI, 529-548.
Rosssiter, J. 2009, North African lamps: Bonifay and beyond. In: Humphrey, J.H. 2009, Studies on Roman Pottery of the Provinces of Africa Proconsularis and Byzacena (Tunisia). Homage à Michel Bonifay. *JRA Supplementary Series Number 76*, 93-105.
Rutgers, L. V., van der Borg, K., de Jong, A.F.M. 2007, Radiocarbon Dating of Several Ancient Jewish Oil Lamps from Rome. *Radiocarbon, vol. 49, n.3*, 1215-1219.
Safrai, Z. 1994, The Economy of Roman Palestine. London and New York: Routledge.
Salomonson, J.W. 1968, Etudes sur la céramique romaine d'Afrique sigillée claire et céramique commune de Hancher el Ouiba (Raqqada) en Tunisie centrale. *BABesch XLIII*, 80-145.
Santacreu, D. A. 2014, Materiality, Techniques and Society in Pottery Production. Warsaw/Berlin: De Gruyter Open Ltd.
Sartre, M. 2005, *The Middle East Under Rome*. London: The Belknap Press of Harvard University Press.
Scheid, J. 1995, 'Graeco ritu: a typically Roman Way of Honoring the Gods', HSCP 97, 15-31.
Schneider, G. 1995, Studies of Roman lamps from the northern provinces and from Rome. In: Olcese, G (ed). 1995, *Ceramica Romana e archeometria: lo state deli study*. *At delle guarantee di studio (Castello di Montegufoni)*. Firenze: All'Insegna del Giglio, 1271-42.
Schortman, E. M., and Urban, P. A. 1992, *Resources, Power, and Interregional Interaction*. New York/ London: Plenum Press.

Schwartz, S. 2001, Imperialism and Jewish Society 200 B.C.E. to 640 C.E. In: Humphreys, R.S., Jordan, W.C., and Schaefer, P. (eds) 2001, *Jews, Christians, and Muslims from the Ancient to the Modern World*. Princeton/Oxford: Princeton University Press.
Schwartz, S. 2009, *Were the Jews a Mediterranean Society? Reciprocity and Solidarity in Ancient Judaism*. Princeton/Oxford: Princeton University Press.
Schwartz, D. R., Weiss, Z.. and Clements, R.A. 2012, Was 70 CE a Watershed in Jewish History. On Jews and Judaism before and after the Destruction of the Second Temple. *Ancient Judaism and Early Christianity 78*. Leiden/Boston: Brill.
Sears, G. 2011, *The cities of Roman Africa*. Brimscombe: The History Press.
Segal, A., Mlynarczyk, J., Burdajewicz, M., Schuler, M., and Eisenberg, M. 2009, *Hippos-Sussita. Tenth Season of excavations*. Haifa: Zinman Institute of Archaeology.
Serrano, L.I.M. 2011, *Lucernas, Candis e Candeias. Para uma Distribuição Geográfica no Território Português*. Unpublished PhD thesis Universidade de Coimbra.
Shanks, H. 1992, *Christianity and Rabbinic Judaism. A Parallel History of Their Origins and Early Development*. Washington, D.C.: Biblical Archaeology Society.
Shaw, B. D. 1995, *Environment and Society. Studies in History and Archaeology*. Aldershot: Ashgate Publishing Limited.
Shenna, S.J (ed). 1989, *Approaches to Cultural Identity*. London: Routledge.
Shepard, A.O. 1956, *Ceramics for the Archaeologist*. Washington, D.C.: Carnegie Institution of Washington.
Silva, G.V. 2003, Reis, santos e feiticeiros: Constâncio II e os fundamentos místicos da basileia (337-361). Vitória: Edfus, 1ed.
Silva, G. V. 2014, A cidade representada pelo poder imperial: Juliano e a censura à população de Antioquia no *Misopogon*. *R. Museu Arq. Etn. Supl., São Paulo, n. 18*, 11-18.
Sivan, D. 1996, *Paleogeography of the Galilee coastal plain during the Quaternary*. Report GSI/18/96. Geological Survey, Jerusalem.
Sim, D.C. 2005, How many Jews became Christian in the first century? The failure of the Christian mission to the Jews. *HTS 61 (1&2)*, 417-440.
Slane, K. W. 1990, *The Sanctuary of Demeter and Kore, The Roman Pottery and Lamps*. Corinth Results of Excavations Conducted by The American Schools of Classical Studies at Athens. Princeton: The American Schools of Classical Studies at Athens.
Smith, R.H. 1966, The Household Lamps of Palestine in New Testament Times. *The Biblical Archaeologist, vol. 29, no. 1*, 1-27.
Smith, L.M.V., Bourriau, J., Goren, Y., Hughes, M.J., Serpico, M. 2004, The Provenance of Canaanite Amphorae found at Memphis and Amarna in the New Kingdom: results 2000-2002. In: Bourriau, J., and Phillips, J. (eds). *Invention and Innovation: The Social Context of Technological Change 2, Egypt, the Aegean and the Near East, 1650-1150 BC*. Oxford: Oxbow Books, 55-77.
Smith, M. E. 2007, Form and Meaning in the Earliest Cities: A New Approach to Ancient Urban Planning. *Journal of Planning History, Vol. 6, No.1*, 3-47.
Sneh, A., Bartov, Y. and Rosensaft, M. 1998, *Geological Lamp of Israel 1:2000.000*. Jerusalem: Geological Survey of Israel.
Stager, I.E. 1991, Eroticism & Infiniticide at Ashkelon. *BAR 17*: 35-53, 70.
Stern, E. J., and Getzov, N. 2006, Aspects of Phoenician Burial Customs in the Roman Period in Light of an Excavation near El-Kabri (Kabri). *'Atiqot 51*, 91-123.
Stern, K. B. 2008, I*nscribing Devotion and Death. Archaeological Evidence for Jewish Populations of North Africa*. Leiden/Boston: Brill.
Stoops, G., Marcelino, V., and Mees, F. 2010, Interpretation of Micromorphological Features of Soil and Regoliths. Amsterdam: Elsevier.
Southern, P. 1990, Signals versus Illumination on Roman Frontiers. *Britannia, vol. 21*, 233-242.
Sussman, V. 1983, The Samaritan Oil Lamps from Apollonia-Arsuf. *Tel Aviv 10*, 71-96.
Sussman, V. 2003, Secular and Religious Life in the Holy Land in the Roman and Byzantine Periods as illustrated on Oil Lamps. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News*. Suisse: Lychnoservices.
Sussman, V. 2004, The Beth Hashitta Mosaic Floor. A New Perspective in the Light of Samaritan Lamps. A New Perspective in the Light of Samaritan Lamps. *LA 54*, 351-368, Pls. 3-10.
Sussman, V. 2008, Chapter 3. The Oil Lamps. In: Patrich, J. 2008, *Archaeological excavations at Caesarea Maritima Areas CC, KK and NN. Final Report, Volume I: The Objects*. Jerusalem: Israel Exploration Society.

Sussman, V. 2012, Roman Period Oil Lamps in the Holy Land. Collection of the Israel Antiquities Authority. *BAR International Series 2447*.
Syon, D. 2008, The Bronze Coinage of Tyre: The First Years of Autonomy. *AJN Second Series 20*, 295-304, pl. 69-70.
Syon, D. 2002, The coins. In: Edwards, D.R. 2002, Khirbet Qana: from Jewish village to Christian pilgrim site. *The Roman and Byzantine Near East, vol. 3*, 129-132.
Syon, D. 2002, The Coins from Burial Caves D and E at Hurfeish. In: Gal, Z. (ed). *Eretz Zafon: Studies in Galilean Archaeology*. Jerusalem: Israel Antiquity Authority Publications, 166*-175*.
Syon, D. 2006, The Coins from El-Kabri. *'Atiqot 51*, 125-129.
Syon, D., and Galili, E. 2009, Byzantine-Period Bronze Coins from the Sea at Dor. *'Atiqot 61*, 81-94.
Syon, D. 2012. Galilean Mints in the Early Roman Period: Politics, Economy and Ethnicity. In: Jacobson, D. M., and Kokkinos, N. 2012, *Judea and Rome in Coins 65 BCE-135 CE*. London: SPINK, 51-64.
Szentléleky, T. 1959, Lamp-producing workshops at Aquincum, *Budapest Régiségei* 19: 167-203.
Szentléleky, T. 1969. *Ancient lamps*. Amsterdam: Adolf M. Hakkert.
Tal, O., and Taxel, I. 2014, Samaritan Burial Customs outside Samaria. Evidence from Late Roman and Byzantine Cemeteries in the Southern Sharon Plain. *Zeitschrift des Deutschen Palästina-Vereins 130/2,* 155-180.
Tal, O. and Teixeira Bastos, M. 2012, Intentionally Broken Discus Lamps from Roman Apollonia: A New Interpretation. *Tel Aviv Vol. 39*, 104-114.
Tal, O. 2015, A Bilingual Greek-Samaritan Inscription from Apollonia-Arsuf/Souzousa: Yet More Evidence of the Use of ΕΙΣ ΘΕΟΣ ΜΟΝΟΣ Formula Inscriptions Among the Samaritans. *Zeitschrift für Papyrologie und Epigraphik 194*, 169–175.
Tal, O. and Teixeira Bastos, M. 2015. More on the Intentionally Broken Discus Lamps from Roman Palestine: Mutilation and Its Symbolic Meaning. In: Blömer, M., Lichtenberger, A. and Raja, R., eds. *Religious Identities in the Levant from Alexander to Muhammed: Continuity and Change. Contextualizing the Sacred 4*. Turnhout: Brepols. Pp. 345-368.
Tal I. 1996, "The Ossuary and Sarcophagus Inscriptions," in The Akeldama Tomb: Three Burial Caves in the Kieron Valley, Jerusalem, IAA Reports 1, Gideon Avni and Zvi Greenhut, eds. Jerusalem: IAA, 55-72, figs. 3.1-3.23.
Tarrer, D. 1995, Banquet Rituels en Palmyre'ne et en Nabate'ne, *ARAM 7 Palmyra and the Arameans*, 165-182.
Taylor, G. 1967, *The Roman Temples of Lebanon*. Beirut: Dar el-Machreq.
Taylor, K. 2004, *Brainwashing. The Science of Thought Control*. Oxford: University Press.
Teixeira Bastos, M. 2011, Cristianização dos Espaços na Antiguidade Tardia: o Caso de Apollonia-Arsuf. Universidade de São Paulo, dissertação de mestrado.
Teixeira Bastos, M. 2014, Arqueologia da Luz: agência da cultura material e a cerâmica de iluminação na Palestina romana. *R. Museu Arq. Etn. São Paulo v. 23, 35-48.*
Teixeira Bastos, M. 2015, A indústria da luz na Palestina Romana: produção, consumo e distribuição de lucernas de disco. *R. Museu Arq. Etn. São Paulo Supl. n. 18*, 99-108.
Teixeira Coelho, J. N. 1996, *Semiótica, Informação e Comunicação*. São Paulo: Editora Perspectiva.
Temin, P. 2006, The Economy of the Early Roman Empire. *Journal of Economic Perspectives Volume 20, n. 1*, 133-151.
Temin, P. 2014. *The Roman market economy.* Princeton (NJ): Princeton University Press.
Testa, P.E. 1962, *Il Simbolismo dei Giudeo-Cristiani*. Jerusalem: Tipografia dei PP. Francescani.
Thorpe, R. 1998-1999, BEY 045. Preliminary Report on the Excavations. *BAAL 3*, 57-83.
Tilley, C. 1994, *A Phenomenology of Landscape. Places, Paths and Monuments*. Oxford: Berg Publishers.
Tite, M.S. 1999, Pottery Production, Distribution and Consumption. The Contribution of the Physical Sciences. *Journal of Archaeological Method and Theory Vol. 6, n. 3*, 181-233.
Tomber, R.S. 1988, Pottery form the 1982-1983 Excavations. In: Humphrey 1988, p. 435-528.
Trost, C., and Hellmann, M.-C. 1996, *Lampes antiques du Département des Monnaies, Médailles et Antiques, III, Fonds général, Lampes chrétiennes*. Paris.
Tsafrir, Y. 1993, *Ancient Churches Revealed*. Jerusalem: Israel Exploration Society.
Tulving, E. 1985, Memory and consciousness. *Canadian Psychologist*, 26, 1—12.
Tulving, E (ed.) 2000, *Memory, Consciousness, and The Brain. The Tallinn Conference*. Philadelphia: Psychology Press, Taylor & Francis Group.
Van Andringa, W., Lepetz, S. 2008, I riti e la morte a Pompei: nuove ricerche archeologiche nella necropoli di Porta Nocera. In: Paolo, G.M., and Giovanni, G. P. 2008, *Nuove ricerche*

archeologiche nell'are vesuviana (scavi 2003-2006). Roma: Studi della Soprintendenza Archeologica di Pompei 25. L'Erma di Soprintendenza.
Van der Horst, P. W. 2006. *Jews and Christians in Their Graeco-Roman Context. Selected Essays on Early Judaism, Samaritanism, Hellenism, and Christianity*. Tübingen: Mohr Siebeck.
Van Dyke, R. M., and Alcock, S.E. 2003, *Archaeologies of Memory*. London: Blackwell Publishing.
Velde, B., and Druc, I. C. 1999, *Archaeological Ceramic Materials. Origin and Utilization*. Berlin/ Heidelberg: Springer-Verlag.
Vertet, H. 1983, Les Techniques de Fabrication del lampes en Terre Cuite du Centre de la Gaule, *Revue Archéologique SITES*, Avignon, 151-157.
Viana, A., and Ribeiro, F. N. 1957, "Notas históricas, arqueológicas e etnográficas do Baixo Alentejo", Separata do Vol. XIII do *Arquivo de Beja*, Minerva Comercial, Beja.
Vitto, F. 2011, A Roman-Period Burial Cave on Ha-Horesh Street, Qiryat Tivon. 'Atiqot 65. Jerusal;em: The Israel Antiquities Authority (Hebrew)
Vucic, J. 2009, Early Christian Clay Lamps in the Archaeological Museum in Zadar. *Catalogues and Monographies 6*, Zadar: Arheoloski muzej.
Vucic, J., and Giunio, K. A., 2009, Luz in tenebris: ancient lamps in the Archaeological Museum in Zadar. *Catalogues and Monographies 7*, Zadar: Arheoloski muzej.
Waliszewski, T. 2011, Lamp-Mould from Jiyeh (Southern Lebanon). A Variant of Ovoid Lamps in the Byzantine and Early Islamic Levant. In: Frangié, D., Salles, J-F. 2011, *Lampes Antiques du Bilad es Sham. Jordanie, Syrie, Liban, Palestine*. Paris: De Boccard.
Wallace-Hadrill, A. 2008, *Rome's Cultural Revolution*. Cambridge: University Press.
Walters, H.B. 1914, *Catalogue of the Greek and Roman Lamps in the British Museum*. London: Order of the Trustees.
Weiner, S. 2010. *Microarchaeology, Beyond the Visible Archaeological Record*. Cambridge: Cambridge University Press.
Wescott, K., Brandon. R. J. 2000, *Practical Applications of GIS for Archaeologists. A Predictive Modeling Toolkit*. London: Taylor & Francis.
Weiss, Z. 2010, From Roman temple to Byzantine church: a preliminary report on Sepphoris in transition. Journal of Roman Archaeology 23, 196-218.
Westenholz, J.G (ed). 2004, *Left there be Light. Oil-Lamps from the Holy Land*. Jerusalem: Bible Lands Museum.
Wexler, L., Gilboa, G. 1996, Oil Lamps of the Roman Period form Apollonia-Arsuf, Journal of Tel Aviv University 23.
Wheatley, D. 2000, Spatial Technology and Archaeological Theory Revisited. In: Sly, T.J.T., and Mihailescu-Birliba (eds). *CAA96. Computer Applications and Quantitative Methods in Archaeology* (BAR International Series 845). Oxford: Archaeopress, 123-132.
Wheatley, D., and Gillings, M. 2002, *Spatial Technology and Archaeology. The archaeological applications of GIS*. London/New York: Taylor & Francis.
Wheeler, R.E.M. 1930. London in Roman times. London: Lancaster House.
Whitbread, I.K. 1991, Image and data processing in ceramic petrology. In: Middletone, A., and Freestone, I. Recent Developments in Ceramic Petrology. London: *British Museum Occasional Paper nº81*, 69-386.
Whibread, I.K 1995, *Greek Transport Amphorae. A Petrological and Archaeological Study*. Fitch Laboratory Occasional Paper 4, The British School at Athens. Exeter: The Short Run Press.
Whitehouse, H., and Lanman, J.A. 2014, The Ties That Bind Us. Ritual, Fusion, and Identification. *Current Anthropology Vol. 55, N. 6*, 1-22.
Wickham C. 2005, *Framing the Early Middle Ages: Europe and the Mediterranean, 400–800*. Oxford: Oxford University Press.
Wieder, M., and Adan-Bayewitz, D. 2002, Soil Parent Materials and the Pottery of Roman Galilee: A Comparative Study. *Geoarchaeology: An International Journal Vol. 17, No. 4*, 393-415.
Wieder, M., and Adan-Bayewitz, D. 1999, Pottery manufacture in early Roman Galilee: a micromorphological study. *Catena 35*, 327-341.
Wilmet, L. 2005, Quelques lampes en terre cuite découvertes au cours des fouilles du temple des *Fabri Navales*, nouveaux témoins des relations entre Ostie et l'Afrique. In: Chrzanovski (ed). 2005, *Lychnological Acts 1. Actes du ler Congrès international d'études sur le luminaire antique (Nyon-Genève, 29.IX - 4. X.2003)*. Monogr. Instrumentum 31. Montagnac: Éditions Monique Mergoil.
Wilmet, L. 2003, Lampes à volutes du Musée de Louvain-la Neuve (Belgique). In: In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Wilson, E.O., 1999, Consilience. New York: Alfred A. Knopf.

Wilson, J. F. 2004, *Caesarea Philippi. Banias, The Lost City of Pan*. London: I.B. Tauris & Co Ltd.
Wilson, A. 2013, The Mediterranean Environment in Ancient History: Perspectives and Prospects. In: Harris, W.V. 2013, *The Ancient Mediterranean Environment between Science and History*. Leiden/Boston: Brill.
Woolf, G. 1992, Imperialism, Empire and the Integration of the Roman Economy. *World Archaeology, Vol. 23, No. 3, Archaeology of Empires*, 283-293.
Woolf, G. 1995, The Formation of Roman Provincial Cultures. In: Metzler, J., Millett, M., Roymans, N., and Slofstra, J. (eds). 1995, *Integration in the Early Roman West: the Role of Culture and Ideology*. Dossiers d'archaéologie du musée national d'histoire et d'art, IV, Luxembourg.
Woolf, G. 1997, Beyond Romans and Natives. *World Archaeology, Vol. 28, No.3, Culture Contract and Colonialism*, 339-350.
Woolf, G. 1997, Polis-Religion and its alternatives in the Roman Provinces. In: Cancik, H., and Rüpke, J (eds). Römische Reichsreligion und Provinzialreligion. Tübingen: Mohr Siebeck, 71-84.
Woolf, G. 2003, A Sea of Faith? In: Malkin, I (ed). 2003, Mediterranean Paradigms and Classical Antiquity. *Mediterranean Historical Review, Vol. 18, No. 2*, 126-143.
Woolf, G. 2003-04, Cultural Change in Roman Antiquity. Observations on Agency. *Kodai, Journal of Ancient History, Vol. 13/14*. Tokyo: The Editorial Board of Kodai, 157-167.
Woolf, G. 2008, Divinity and Power in Ancient Rome. In: Brisch, N (ed). Religion and Power. Divine Kingship in the Ancient World and Beyond. Chicago: *The Oriental Institute of the University of Chicago, Oriental Institute Seminars, Number 4*, 235-251.
Woolf, G. 2009, Found in Translation. The Religion of the Roman Diaspora. In: Hekster, O., Schmidt-Hofner, S., and Witschel, C. 2009, *Ritual Dynamics and Religious Change in the Roman Empire*. Leiden/Boston: Brill.
Woolf, G. 2009, Word Religion and World Empire in the Ancient Mediterranean. In: Fabricius, F. 2009, *Die Religion des Imperium Romanum. Koine und Knfrontationen*. Tübingen: Mohr Siebeck.
Woolf, G. 2011, Provincial Revolts in the Early Roman Empire. In: Popovic, Mladen (ed). 2011, *The Jewish Revolt against Rome*. Interdisciplinary Perspectives. Leiden/Boston: Brill.
Woolf, G. 1997, The Roman Urbanization of the East. In: Alcock, S (ed). 1997, The Early Roman Empire in the East. Oxford: Oxford University Press, 1-14.
Wunderlich, C-H. 2003, Light and Economy. An Essay about the Economy of Prehistoric and Ancient Lamps. In: Chrzanovski, L. 2003, *Nouveautés Lychnologiques, Lychnological News.* Suisse: Lychnoservices.
Yaalon, D.H., and Ganor, E. 1973, The influence of dust on soils during the Quaternary. *Soil Science, 116*, 146-155.
Yaich, C., Hooyberghs H.-J.-F., Durlet C., Renard M. 2000, Corrélation stratigraphique entre les unités oligo-miocènes de Tunisie centrale et le Numidien. Earth and Planetary Sciences 331, 499–506.
Yardley, B.W.D., Mackenzie, W.S., and Guilford, C. 1990, *Atlas of metamorphic rock and their textures*. London: Longman Group UK, Longman Scientific & Technical.
Yitzhak, M. 2009, Flavia Neapolis. Shechem in the Roman Period. Volume I. Jerusalem: Judea & Samaria Publications.
Yitzhak, M. 2009, Flavia Neapolis. Shechem in the Roman Period. Volume II. Jerusalem: Judea & Samaria Publications.
D. Urman, D. 1974, "Archaeological Remains in Northern Bashan," in Qadmoniot 23–24 (1974), p. 89 (Hebrew); M. Ben-Dov, "A Lintel from the Bashan Depicting Three Deities," in Israel Exploration Journal 24, 185–186.
Zangemberg, J., Attridge, H., and Martin, D. 2007, *Religion, Ethnicity, and Identity in Ancient Galilee. A Region in Transition*. Tübingen: Mohr Siebeck.
Zemer, A. 1997, *(edt) the Treasures of Caesarea*. Haifa Museum, The National Maritime Museum.
Zhuravlev, D (ed). 2002, Fire, Light and Light Equipment in the Graeco-Roman World. *BAR International Series 1019*. Oxford: Archaeopress.
Zhuravlev, D. 2012, Syro-Palestinian Lamps from Chersonesos and their derivatives of the Roman and Byzantine Period. *Rei Cretariae Romanae Favutorvm Acta 42*, 23-32.
Zissu, B., Klein, E. 2011, A Rock-Cut Cave from the Roman Period at Beit Nattif, Judean Foothills. *Israel Exploration Journal Volume 61, No. 2*. Jerusalem, 196-216.