



Universiteit
Leiden
The Netherlands

The archaeology of the first farmer-herders in Egypt : new insights into the Fayum Epipalaeolithic and Neolithic

Shirai, N.

Citation

Shirai, N. (2010, April 29). *The archaeology of the first farmer-herders in Egypt : new insights into the Fayum Epipalaeolithic and Neolithic*. *Archaeological Studies Leiden University*. Retrieved from <https://hdl.handle.net/1887/15339>

Version: Corrected Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/15339>

Note: To cite this publication please use the final published version (if applicable).

The Archaeology of the First Farmer-Herders in Egypt

New Insights into the Fayum Epipalaeolithic and Neolithic



Leiden University Press

Archaeological Studies Leiden University
is published by Leiden University Press, the Netherlands

Series editors: C. C. Bakels and H. Kamermans

Cover Design: Joanne Porck
Layout: Noriyuki Shirai
Illustrations: Noriyuki Shirai

ISBN 9789087280796
E-ISBN 9789048512690
NUR 682

© Noriyuki Shirai / Leiden University Press, 2010

All rights reserved. Without limiting the rights under copyright reserved above, no part of this book may be reproduced, stored in, or introduced into a retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without the written permission of both the copyright owner and the author of the book.

ARCHAEOLOGICAL STUDIES LEIDEN UNIVERSITY 21

The Archaeology of the First Farmer-Herders in Egypt

New Insights into the Fayum Epipalaeolithic and Neolithic

Proefschrift

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. P. F. van der Heijden,
volgens besluit van het College voor Promoties
te verdedigen op
donderdag 29 april 2010
klokke 13.45 uur

door

Noriyuki Shirai

geboren te Kyoto
in 1970

Promotiecommissie

Promotor: Prof. Dr. J. Bintliff (Universiteit Leiden)

Co-promotor: Prof. Dr. A. L. Van Gijn (Universiteit Leiden)

Referent: Prof. Dr. P. M. Vermeersch (Katholieke Universiteit Leuven)

Overige leden: Prof. Dr. P. M. M. G. Akkermans (Universiteit Leiden)

Prof. Dr. R. T. J. Cappers (Universiteit Leiden)

Prof. Dr. L. P. Louwe Kooijmans (Universiteit Leiden)

Dr. G. Van der Kooij (Universiteit Leiden)

This research was made possible with the grant of the Netherlands Organisation for Scientific Research (NWO/WOTRO file number: W52-1038).

Contents

Preface	xii
1. Introduction	1
1.1. Present state of knowledge regarding the origins and development of farming and herding in Egypt	1
1.2. Aims of research	4
2. Neolithisation in Egypt in a wider context	7
2.1. Geographical and chronological distribution of Early-Middle Holocene cultures in Egypt	7
2.2. Origins and early development of Neolithic farming and herding cultures in Egypt	11
2.3. The relevance of supra-regional concepts for Egyptian Neolithic research	13
2.4. Factors causing Neolithisation in Egypt	16
2.4.1. Climate, flora, and fauna	16
2.4.2. Population aggregation and sedentism	20
2.4.3. Population movements and expansion of sociocultural and socioeconomic networks	22
2.4.4. Dispersal of farming and herding in the Levant and the availability of domesticated wheat/barley and sheep/goats for Egypt	24
2.4.5. Human cognitive development and human agency	28
2.5. Areas of cooperative research	29
2.6. Structural history of Neolithisation	30
2.7. Summary	31
3. Background to research in the Fayum	33
3.1. Introduction	33
3.2. The Fayum geography and geology	33
3.3. History of archaeological field research in the Fayum	36
3.3.1. The age of the antiquarians	36
3.3.2. The first modern academic research in the 1920s and 1930s	37
3.3.3. Resumption of research in the 1960s	39
3.3.4. New research after the 1970s	40
3.4. Holocene chronology and cultures of the Fayum	43
3.4.1. The Qarunian	44
3.4.2. The Fayumian	45
3.4.3. The Moerian	49
3.4.4. The Fayum Predynastic	50
3.5. Some consideration on the sequence of the Fayum Epipalaeolithic and Neolithic and the controversial time gap between them	52
3.5.1. Climatic and environmental conditions at the Epipalaeolithic-Neolithic transition	52
3.5.2. Radiocarbon chronology of Epipalaeolithic and Neolithic sites	54
3.5.3. Lithic artefacts at the Epipalaeolithic-Neolithic transition	54
3.6. The Epipalaeolithic-Neolithic transition and the beginning of farming and herding in the Fayum	61
3.7. Local factors for the transition to food production in the Fayum	63
3.7.1. Flora	63

3.7.2. Fauna	67
3.7.3. Climatic and environmental fluctuations and resource scheduling	73
3.7.4. Population aggregation and the emergence of sedentism	76
3.7.5. Mobility	78
3.8. Strategies for new research	79
4. Explanatory and predictive models for the beginning of farming and herding in the Fayum	81
4.1. Introduction	81
4.2. Adaptive model	81
4.2.1. Optimal foraging models	81
4.2.1.1. Prey choice model (Diet breadth model)	82
4.2.1.2. Patch choice model	83
4.2.2. Related concepts of optimal foraging models	84
4.2.2.1. Time allocation	84
4.2.2.2. Responses to risks	85
4.2.2.3. Central place foraging and mobility strategies	86
4.2.2.4. Information acquisition and maintenance of kin networks	89
4.2.2.5. Time investment in subsistence technology	90
4.2.2.6. Foraging and technological organisation	92
4.2.2.7. Habitat selection and territoriality	92
4.2.2.8. Traveller-processor model	94
4.2.2.9. Showing-off behaviour and costly signalling	95
4.2.2.10. Reproductive interests	96
4.3. Some considerations on the Fayum data in the light of optimal foraging models	97
4.3.1. Optimal diet of the Fayum inhabitants	97
4.3.2. Risk prevention/responsive strategies of the Fayum inhabitants	100
4.3.3. The mobility and residential patterns of the Fayum inhabitants	101
4.3.4. Habitat selection and territoriality of the Fayum inhabitants	103
4.3.5. Changes in subsistence technology at the Fayum Epipalaeolithic-Neolithic transition	104
4.4. Socioeconomic model	105
4.4.1. The socioeconomic competition model	105
4.4.2. The social meaning of technology and the emergence of prestige technologies	106
4.5. Some considerations on the Fayum data in the light of the socioeconomic model	109
4.5.1. Bifacial lithic technology in the Western Desert in the Early-Middle Holocene	110
4.5.1.1. Natural preconditions for the appearance of bifacial stone tools in the Western Desert	111
4.5.1.2. Interpretations of bifacially-retouched stone tools in the Western Desert	114
4.5.1.3. The implications of the development of bifacial stone tools for the beginning of animal herding in the Egyptian Western Desert	116
4.5.2. The origin and development of bifacially-retouched stone tools in the Fayum Neolithic and their implications for the beginning of farming and herding in the Fayum	117
4.6. Summary	118
5. The Fayum Epipalaeolithic and Neolithic in the light of new survey results	119
5.1. Introduction	119
5.2. The survey area	119
5.3. The cultural heritage management orientation	125
5.4. Artefact collecting by previous visitors	126

5.5. The definition of an archaeological site	127
5.6. Method of survey and recording	131
5.7. Field observations of the survey area	133
5.7.1. The K Basin-L Basin area	133
5.7.1.1. Kom K	133
5.7.1.2. Site K	133
5.7.1.3. The Upper K Pits and Lower K Pits	133
5.7.1.4. Gebel L	136
5.7.1.5. Site L	137
5.7.1.6. L Basin reservoir and clay mines	138
5.7.1.7. Summary of the K Basin-L Basin area	140
5.7.2. The L Basin-X Basin area	140
5.7.2.1. Site LX	142
5.7.2.2. Surroundings of Site LX	144
5.7.2.3. Site E29H1	144
5.7.2.4. Surroundings of Site E29H1	145
5.7.2.5. Intersection of the X Basin and Wadi A	145
5.7.2.6. Site XA	145
5.7.2.7. Other features	147
5.7.2.8. Summary of the L Basin-X Basin area	147
5.7.3. The X Basin-Z Basin area	147
5.7.3.1. Site X and Site W	147
5.7.3.2. Other features	149
5.7.3.3. Kom W and its vicinities	149
5.7.3.4. Site V and the Site V Depression	154
5.7.3.5. Camp II, the Camp II Depression, and the Camp II Basin	155
5.7.3.6. The dune on the west and northwest sides of the Camp II Basin	158
5.7.3.7. The southern shore of the Z Basin	159
5.7.3.8. The northern shore of the Z Basin	159
5.7.3.9. The barren terrain to the north of the northern shore of the Z Basin	161
5.7.3.10. The terrain to the south of the southern shore of the Z Basin	161
5.7.3.11. Summary of the X Basin-Z Basin area	162
5.7.4. Wadi A and Wadi B in the Gindi Plain	163
5.8. Radiocarbon dates	166
5.9. The spatial distribution of hearths and its implication for the land use pattern	167
5.10. The spatial distribution and nature of Epipalaeolithic localities/sites in the L Basin, X Basin and Z Basin areas	167
5.11. The spatial distribution of sickle blades and grinding stones and its implication for the land use pattern in the Fayum Neolithic	172
5.11.1. Sickle Blades	172
5.11.2. Grinding stones	173
5.12. The spatial distribution and nature of Neolithic localities/sites in the L Basin- X Basin area	175
5.13. The palaeoenvironment of the X Basin-Z Basin area and the foraging radius of the Kom W inhabitants in the Neolithic	178
5.14. The distribution and nature of Epipalaeolithic and Neolithic localities in Wadi A and Wadi B in the Gindi Plain	182

6. Lithic technological organisation and mobility in the Fayum Epipalaeolithic	183
6.1. Introduction	183
6.2. The locations and features of Fayum Epipalaeolithic localities/sites	184
6.3. Previous studies of Fayum Epipalaeolithic lithic assemblages	185
6.4. Epipalaeolithic lithic assemblages on the northern shore of the Z Basin	188
6.4.1. Introduction	188
6.4.2. A concentration of turtle bones	190
6.4.2.1. Lithic raw materials	190
6.4.2.2. Cores	191
6.4.2.3. Debitage products	191
6.4.2.4. Tools	191
6.4.3. A gentle slope next to the turtle bone concentration	191
6.4.3.1. Lithic raw materials	191
6.4.3.2. Cores	192
6.4.3.3. Debitage products	193
6.4.3.4. Lithic manufacture	194
6.4.3.5. Tools	194
6.4.3.6. Miscellaneous	194
6.4.4. A lithicdebitage concentration	196
6.4.4.1. Lithic raw materials	196
6.4.4.2. Cores	197
6.4.4.3. Debitage products	198
6.4.4.4. Lithic manufacture	198
6.4.4.5. Tools	198
6.4.5. Hearth field	199
6.4.6. Some consideration on life in Site Z	200
6.5. Epipalaeolithic lithic assemblage at the Camp II Ridge on the eastern shore of the Z Basin ..	200
6.5.1. Introduction	200
6.5.2. Surface collection square A	201
6.5.2.1. Lithic raw materials	201
6.5.2.2. Cores	201
6.5.2.3. Debitage products	202
6.5.2.4. Lithic manufacture	202
6.5.2.5. Tools	202
6.5.3. Surface collection square B	202
6.5.3.1. Lithic raw materials	202
6.5.3.2. Cores	204
6.5.3.3. Debitage products	205
6.5.3.4. Lithic manufacture	205
6.5.3.5. Tools	205
6.5.4. A low mound to the east of surface collection squares A and B	205
6.5.5. Some considerations on life at the Camp II Ridge	206
6.6. Epipalaeolithic lithic assemblages on the northeastern shore of the X Basin	206
6.6.1. Introduction	206
6.6.2. Area D	208
6.6.3. Area D hearths	209
6.6.3.1. Description of individual hearths	209
6.6.3.2. Some considerations on the life history of the hearths	217

6.6.4. Wide scatters of lithic artefacts in the middle of the hearth field	218
6.6.4.1. Raw materials	219
6.6.4.2. Cores	220
6.6.4.3. Debitage products	222
6.6.4.4. Tools	223
6.6.5. Lithicdebitage concentrations	223
6.6.6. Lithicdebitage concentration A	224
6.6.6.1. Lithic raw materials	224
6.6.6.2. Cores	225
6.6.6.3. Debitage products	225
6.6.6.4. Lithic manufacture	227
6.6.6.5. Tools	227
6.6.7. Lithicdebitage concentration B	227
6.6.7.1. Lithic raw materials	228
6.6.7.2. Cores	228
6.6.7.3. Debitage products	228
6.6.7.4. Lithic manufacture	229
6.6.7.5. Tools	229
6.6.8. Some considerations on life at Site E29H1	229
6.7. Epipalaeolithic lithic assemblage at a watching station in Wadi B	231
6.7.1. Introduction	231
6.7.2. Lithic assemblage at the watching station	232
6.7.2.1. Lithic raw materials	232
6.7.2.2. Cores	234
6.7.2.3. Debitage products	234
6.7.2.4. Lithic manufacture	236
6.7.2.5. Tools	236
6.7.3. The mobility and subsistence of Epipalaeolithic people in a wadi	236
6.8. The procurement of flint pebbles/cobbles, core reduction techniques, and tool use in the Fayum Epipalaeolithic	237
6.9. Concluding remarks	239
7. Lithic technological organisation and mobility in the Fayum Neolithic	241
7.1. Introduction	241
7.2. Sites studied	242
7.2.1. Kom K	243
7.2.2. Site L	245
7.2.3. Site E29H1	246
7.2.4. Site XA	249
7.2.5. Site X	249
7.2.6. Locality ‘Calcified Shrubs’	252
7.2.7. Kom W	252
7.2.8. The Site V Depression	258
7.3. Identifying and distinguishing Neolithic cobbles and lithic cores from Epipalaeolithic and Old Kingdom examples	259
7.4. The description of the rock types collected at Neolithic sites	264
7.5. Remarks on the various uses of cobbles and core reduction techniques	266
7.5.1. Cobble shapes	267

7.5.2. Core reduction techniques	267
7.5.3. Flakes	269
7.5.4. Hammers	269
7.5.5. Wasteful and thorough uses of flint cobbles	273
7.5.6. Enigmatic stone balls	274
7.5.7. Differences in the use of cobbles and the core reduction techniques between the sites studied	275
7.6. Sources of lithic raw materials in the Fayum Depression and its vicinity	276
7.6.1. The northern fringe of the Fayum Depression	276
7.6.2. Rocky terrains close to the present lakeshore	278
7.6.3. The Nile-Fayum Divide	278
7.6.4. Ilwet Hialla and Umm es-Sawan	283
7.6.5. Summary	286
7.7. Lithic raw material procurement and its embeddedness in mobility and subsistence strategies	286
7.7.1. Residential mobility	287
7.7.2. Logistical mobility	288
7.7.3. Eclectic mobility	290
7.7.4. Non-embedded lithic raw material procurement	290
7.8. Mobility pattern and lithic raw material economy	291
7.9. Expedient toolmaking and curation	292
7.9.1. Uses of half-split discoids	292
7.9.2. Uses of primary flakes	293
7.9.3. Uses of other cortical flakes	300
7.9.4. Uses of non-cortical flakes	300
7.9.5. The progressive manner of making bifacially-retouched tools	302
7.9.6. Expedient toolmaking reconsidered	303
7.10. Development of bifacial technology in terms of design theory and behavioural ecology	304
7.10.1. Arrowheads and knives	304
7.10.2. Axes, gouges, and planes	306
7.10.3. Sickle blades	307
7.11. Development of a unique technological organisation in the Fayum Neolithic	309
7.12. Concluding remarks	310
8. The diffusion of material culture and domesticates from the Levant to Egypt	311
8.1. Introduction	311
8.2. Means of contact	311
8.3. A brief overview of diagnostic Neolithic material items in Egypt and the southern Levant ...	312
8.3.1. Pottery	312
8.3.2. Stone tools	314
8.4. The first wave of diffusion of Levantine material culture to Egypt: The Helwan point	317
8.4.1. Introduction	317
8.4.2. Definition and division of Helwan points	318
8.4.3. The present state of knowledge regarding the spatial and chronological distribution of side-notched projectile points in northeastern Africa	319
8.4.4. The manufacture and form of the side-notched projectile points in northeastern Africa	321
8.4.5. The time gap between Levantine Helwan points and African side-notched projectile points	324

8.5. The Ounan points and unifacially/bifacially-retouched projectile points in northeastern Africa, Sinai, the Negev and southern Levant	325
8.6. The second wave of diffusion of Levantine material culture to Egypt: The Pottery Neolithic projectile points	326
8.6.1. Introduction	326
8.6.2. The study of small projectile points in the Levantine Pottery Neolithic and the Egyptian Western Desert (bi)facial techno-complex	327
8.6.3. The possible date of unifacially/bifacially retouched, tanged or leaf-shaped small projectile points in the Fayum	328
8.7. The spread of Levantine influence to northeastern Africa in the 7th - 6th millennia cal.BC ..	330
8.7.1. The timing of the spread of Levantine influence to northeastern Africa	330
8.7.2. The stylistic behaviour of foragers	331
8.7.3. The territories of Levantine farmer-herders and the boundaries between Levantine farmer-herders and Egyptian foragers	332
8.8. Concluding remarks	335
9. Synthesis	337
9.1. Research background and aim	337
9.2. Research results	337
9.2.1. Revision of the Early-Middle Holocene chronology of the Fayum	337
9.2.2. The origins of the Fayum Neolithic material culture	338
9.2.3. Land use and resource scheduling in the Fayum Epipalaeolithic and Neolithic in terms of lithic technological organisation	339
9.3. Contextualising the beginning of farming and herding in the Fayum into the Neolithisation of the Levant and northeastern Africa	340
9.4. Conclusion	342
References	343
English Summary	375
Nederlandse samenvatting	377
List of figures	379
List of tables	385
Acknowledgements	388
Curriculum Vitae	389

Preface

This dissertation includes the result of my fieldwork carried out in the framework of the UCLA-RUG Fayum Project, which is directed by Willeke Wendrich and René Cappers. A full account of the work by the Fayum Project and further acknowledgements would appear in a monograph edited by them and published by the Cotsen Institute of Archaeology at University of California, Los Angeles.