POLISH PUBLICATIONS IN MEDITERRANEAN ARCHAEOLOGY 11

"MAREA"/PHILOXENITE
A TOWN AND PILGRIMAGE STATION ON THE ROAD TO THE SANCTUARY OF SAINT MENAS (ABU MENA)

VOLUME 1: HISTORY AND TOPOGRAPHY

EDITED BY Tomasz Derda and Mariusz Gwiazda



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Chapter 8. Phytoliths analysis from sediments of Philoxenite

Fig. 1. Plan of Philoxenite showing the positions of the studied cores (drawing M. Gwiazda)
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Fig. 9. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–7: Triticum aestivum (1, 2, 4–7: Dendritic long cell phytolith from inflorescence tissue of bread wheat; 3: Long trapezoid phytolith from lamina tissue); 8–10: Triticum dicoccum (Dendritic phytoliths from inflorescence tissue of emmer wheat); 11–12: Hordeum vulgare (tracheids phytolith of barley); 13: Hordeum vulgare (trapezoid dentate phytolith of barley). Scale bar 10 μm (photo A.A. Zalat)

Fig. 10. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. Different types of Cuneiform bulliform cell from reeds. 1–2: Phragmites australis; 3: Arundo formosana; 4: Arundo donax; 5–7: Cynodon dactylon (different types of bulliform cells in leaf blade); 8–9: Scutiform-bulliform from Arundinoideae; 10–12: Fan-shaped, decorated cuneiform bulliform phytoliths of rice (Oryza-type). Scale bar 10 μm (photo A.A. Zalat)

Fig. 11. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1: Fan-shaped phytolith of Oryza-type; 2: Double-peaked-shape glume cell of Oryza-type; 3–4: Square, silicified bulliform cell (blocky); 5–6: Rectangular bulliform; 7: Rectangular bulliform (sedges); 8: Blocky polyhedral; 9: Acicular-prickle hair phytolith (Acute bulbosus); 10: Acicular hair lanceolate cell (Acute bulbosus); 11–12: Acicular hair cell; 13–15: Trichomes-prickle hairs from the leaves of Hordeum vulgare; 15–17: Hat-shaped morphotypes of Cyperaceae. Scale bar 10 μm (photo A.A. Zalat)

Fig. 12. Light microscopic photomicrographs of various Globular morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–9: Globular echinate (Globular crenate from Aracaceae, Palm); 10–17: Globular granulate; 18–25: Globular psilate (smooth). Scale bar 10 μm (photo A.A. Zalat)

INTRODUCTION

Tomasz Derda, Mariusz Gwiazda

"Marea"/Philoxenite is located on the southern shore of Lake Mareotis (modern Lake Mariout), near the village of Huwwariya, approximately 40 km from Alexandria and 16 km from Abu Mena. Archaeological investigations at the site have been carried out since 2000 by a Polish mission jointly organized by the University of Warsaw and the Archaeological Museum in Cracow. The excavations were initiated and originally directed by Hanna Szymańska, who led the project until her untimely death in 2010, after which the directorship passed to Krzysztof Babraj. Since 2019, the mission has been directed by Tomasz Derda, one of the editors of this volume.

The identification of the site as "Marea" was first proposed by Mahmud el-Falaki, the renowned savant and astronomer, author of the map of Alexandria and its environs (el-Falaki 1866) and of a pioneering study on the region (el-Falaki 1872). Guided by the accounts of classical authors (Herodotus, Thucydides, Diodorus Siculus), he searched for the remains of Marea. His attention was drawn to stone structures on the southern shore of Lake Mareotis, which, in his view, indicated the presence of an ancient city. Indeed, this was the only major concentration of ruins on that side of the lake.

In 1983, however, Mieczysław Rodziewicz, an archaeologist with a particular interest in the region west of Alexandria, questioned el-Falaki's identification. He advanced instead the hypothesis that the site represented a settlement or town established at the end of the 5th century to manage the flow of pilgrims arriving by water from Alexandria on their way to the sanctuary at Abu Mena (Rodziewicz 1983; see also Rodziewicz 2003 and 2010).

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Between 2018 and 2023, one of the editors of this volume, Tomasz Derda, directed a project funded by the National Science Centre of the Republic of Poland, devoted to the study of the city's topography through a broad range of methods (*Is "Marea" indeed Marea? Roman Industrial Centre and Byzantine City in the Region of Mareotis*, UMO-2017/25/B/HS3/01841). The project commenced with an extensive non-invasive survey covering 21 hectares of the site, which yielded significant results subsequently correlated with the surface survey and the documentation of all visible architectural remains. This was followed by a series of test excavations. Although archaeological in methodology, the project has yielded results of considerable importance for historical studies. The application of non-invasive techniques not only guided the definition of excavation objectives for the following seasons, but also allowed us to place previously investigated structures into their broader urban context. The principal aim of the project was to establish the topography of the site, with particular attention to the street grid and the character of the built environment.

The results of the project are to be published in two volumes. The first volume opens with a chapter by Ewa Wipszycka, which situates the Philoxenite within the context of the sanctuary

of St Menas (Abu Mena). The following chapter, authored by Tomasz Derda, is devoted to the founder of the settlement on the southern shore of Lake Mareotis, Flavius Theodorus Philoxenus Soterichus, consul of the East in the year 525. Chapter Three, by Przemysław Piwowarczyk, presents a corpus of source texts connected with the cult of St Menas. The profound transformations experienced by the entire region in the Islamic period are discussed in the subsequent chapter by Tomasz Barański. Chapter Five, written by Andrzej B. Kutiak, traces the history of modern (from the late 18th century onwards) interest in the region, particularly in its geography. In Chapter Six, the topography of the site is examined by Andrzej B. Kutiak, who proposes dividing the town into ten sectors and provides a detailed description of each. Chapter Seven offers a synthesis of non-invasive research, in particular geomagnetic surveys, carried out by two teams led respectively by Krzysztof Misiewicz (in 2018) and Tomasz Herbich (since 2020). The volume concludes with Chapter Eight by Abdelfatah A. Zalat, devoted to reconstruction of plant use, vegetation, and environmental conditions on the site.

The presentation of the results obtained from our test trenches, conducted in various parts of the site, will constitute the greater part of the second volume, the publication of which is scheduled for 2027. The principal author of this section will be the second editor of the series, Mariusz Gwiazda. The ceramic material from all seasons will be presented by Katarzyna Danys, Krzysztof Domżalski, and Alexandra Konstantinidou, while Aleksandra Pawlikowska-Gwiazda discusses oil lamps and terracotta figurines. Julia Burdajewicz contributes two chapters, the first devoted to wall paintings and the second to the conservation of architectural remains. Renata Kucharczyk provides a catalogue of the glass finds, and Mariusz Gwiazda examines the assemblage of stone objects. Dawid Wieczorek analyzes the technology of stone building-material production, whereas Nicolas Morand investigates the faunal remains. Finally, Kacper Wasilewski and Ewa Sobczyńska report on conservation works undertaken in the underground tombs.

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The history of the Byzantine town began on the northern promontory (see in particular Wipszycka's chapter in the present volume), where in the 5th century—perhaps during the reign of Zeno—the first church was constructed: a three-aisled basilica without a transept. The date of its construction remains disputed. Its discoverers, Krzysztof Babraj and Daria Tarara, argue for an earlier chronology (Babraj, Drzymuchowska, and Tarara 2020), although in our view the archaeological evidence does not support this interpretation. The site selected for the church had remained unused for roughly two centuries; until the 230s it had served as a centre for the mass production of amphorae, as indicated by the discovery of a pottery kiln beneath the apse of the Great Basilica, east of the baptistery of the Old Church. In the immediate vicinity of the earlier basilica there stood a pier—the longest of the three preserved at "Marea"/Philoxenite—which appears to have been constructed in the period of the large-scale amphora workshops.

The Lower (Old) Church was surrounded by additional buildings, the character of which has only begun to be clarified during the last two excavation seasons. At present we are not in a position to determine the full extent of this architectural complex, and consequently cannot establish with certainty whether it constituted a proper town. The Lower Church was decorated with wall paintings: its interior walls were most likely entirely covered with frescoes, the remains of which—

thousands of fragments—were recovered in the space between the floor level of the earlier basilica and the foundations of the Great Basilica. Both the Lower Basilica and the adjacent buildings are contemporary, probably dating to the second half of the 5th century. The Great Basilica, the earlier church beneath it, and the associated structures remain the subject of intensive archaeological investigations carried out by the team directed by Krzysztof Babraj and, for this reason, do not form part of the research presented in the present volume.

Approximately three hundred meters south of the first basilica and its adjacent structures, a complex was constructed consisting of bipartite baths—interpreted by their discoverers as separate facilities for men and women—and, a few meters away, a well equipped with a water wheel (*saqiya*) that supplied the installation with running water. The baths and well, excavated between 2000 and 2006, were published in 2008 (Szymańska and Babraj [eds] 2008). The authors of that study, Hanna Szymańska, Krzysztof Babraj, and Daria Tarara, repeatedly emphasized the difficulties in establishing the precise stratigraphy of the building, a circumstance that complicates the reconstruction of the complex's architectural evolution and a more exact chronological framework. While refraining from narrowing the chronology further, the authors proposed a general dating to the first half of the 6th century.

Not before the mid-6th century was the decision taken to establish a town on the entire peninsula. Its urban layout leaves no doubt that subsequent buildings were erected according to a carefully conceived plan, one that required substantial financial investment. The first stage of this ambitious enterprise appears to have begun on the northern promontory. At that point, it was decided to demolish the earlier basilica, deemed insufficiently monumental for the needs of the new city. Such a decision reflects the aspirations of the architect or patron behind this new urban concept. The earlier church, though relatively short-lived, had been distinguished by its interior decoration—especially the wall paintings, painstakingly reconstructed by Julia Burdajewicz from thousands of surviving fragments—which gave the building a distinctive character. Nonetheless, a more imposing edifice was now required to serve as the focal point of the new town.

A large basilica with a transept was constructed, measuring 51 by 49 meters. In terms of size, it ranks as the second-largest ancient church in Egypt, exceeded in length by only a few meters by the basilica at Abu Mena. The monumental bulk of the Great Basilica was clearly visible from afar, serving as a striking landmark for those approaching the city by water from Alexandria across the lake.

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Chapter One

PHILOXENITE: PILGRIMS ON THE ROAD TO ABU MENA

Ewa Wipszycka

The aim of this study is to recreate the "real reality" experienced by the travellers on the road to Abu Mena, especially of those who would arrive through Philoxenite. I will not be dealing with individual or social imaginations and emotional reactions of people coming into direct contact with the sacrum. Numerous works on this topic have been published,[1] and I assume that the reader is familiar with at least some of them. I will, therefore, plunge right *in medias res* without further reminders about the significance of this topic.

The historical context

In order to understand the phenomenon of Philoxenite, we must first consider what was happening beyond the borders of this settlement: in Abu Mena, which it served, and in Alexandria, from where many of the visitors to the shrine came, and where decisions affecting the settlement were made.

Since the mid-5th century, Alexandria was a battleground between various sides of Christological controversies. Tensions connected to the controversies would often spill out into the streets, giving rise to dangerous riots. The situation in this huge and important city was a constant source of anxiety for the rulers in Constantinople, especially given the capital's dependence on Egyptian grain.

We do not have knowledge of the beginnings of Abu Mena. We do not know why the cult of Saint Menas was born precisely at this spot in the desert. The hagiographical texts that have come down to us cannot serve as a reliable source of information on this point. The tradition represented by them attributes the creation of the shrine either to the patriarch Athanasius or the patriarch Theophilus. It is unlikely that Athanasius could be the founder of the first structures connected to St Menas's cult in Abu Mena, and there is more indication that it could have been Theophilus.[2]

[1] For example: Ousterhout (ed.) 1990; Frank 2000; Bitton-Ashkelony 2005; Elsner and Rutherford (eds.) 2007 (in particular the excellent essay by Jaś Elsner); Stafford 2019.

[2] The most important testimony to this tradition is the *Encomium of St Menas* published in Drescher 1946: 36–72 (text), 126–149 (translation). In my paper (Wipszycka 2012), I was mistaken about the location of the Philoxenite, but I fully confirm what I wrote there on the value of the *Encomium*'s information about Abu Mena's origins (pp. 423–424), namely that it is pure fiction made up of topical elements peculiar to Alexandrian ecclesiastical propaganda. This propaganda tended to ascribe a decisive, causative, role to Athanasius. The discoverer of Abu Mena, Karl Maria Kaufmann, even suggested Constantinian origins (he believed—wrongly—that the cult of St Menas began immediately after the persecutions of Diocletian). Unfortunately, Drescher, in the introduction to his work (Drescher 1946: XVII–XX), summarizing older ideas, did not dissociate himself from them decisively. He is not to blame; at the time he wrote, academic research on hagiography was just beginning, and, after a long hiatus, excavations were only resumed in the 1960s.

Archaeological research conducted at the site of Abu Mena has provided information that allows us to date the earliest constructions of the settlement to the last quarter of the 4th century. The erection of the basilica over the tomb, however, occurred slightly later, around the beginning of the 5th century, during the patriarchate of Theophilus.

This large pilgrimage centre, situated not far from such an important and restless city, drew the attention of the emperors as well. By donating considerable funds to places like Abu Mena, the emperor could demonstrate his piety, which was widely believed to provide divine favour, manifesting itself in good crops and military victories against the Empire's enemies. Funding large-scale building projects indicated the ruler's power and concern for his subjects. The emperor's generosity could also be an expression of his support for particular bishops and could enhance their standing in Church politics. This was of great importance at a time of doctrinal controversies and conflicts between candidates for the title of bishop.

The first reliable record of imperial funding for the maintenance of the shrine comes from the *Encomium of St Menas* and refers to Emperor Zeno (474–491).[3] A section of the *Encomium* concerns the history of the religious complex dedicated to this saint:[4]

> And it befell in the days of Timotheus [Aelurus—EW], the confessor-archbishop, in the days of Zeno, the God-loving king, that the blessed king heard of the wonders and miracles and cures that took place at the shrine of the holy Apa Mena. He marvelled and glorified God Who glorifieth His saints. Then the archbishop, Timotheus, told the king, Zeno, about the barbarians who came over Mariotes, afflicting the shrine and all the churches in Mariotes. Then the king ordered all those of senatorial rank in the kingdom to build each of them a palace there. He also wrote to the archonts of Alexandria and those of Egypt, that each of them through the land should build himself a house there until they made a city. And so, it was built and given the name of Martyroupolis. Multitudes gathered from every land and resided in it. And the king Zeno established, also, a garrison of 1200 soldiers to guard that place against the inroads of the barbarian horde. And the God-loving king did this as an aid to the whole Mariotes and the shrine likewise. And he provided their maintenance from the revenues of Mariotes. And he also gave to the shrine some eparchies of Egypt, remitting their taxes that the money might be used for the expenses of the church and the hospices which he built at it (Drescher 1946: 69–70 [text] and 146–147 [translation]).

Not all of the information from this passage of the *Encomium* is likely to be true. This, however, should not be a reason for concern; when reading a hagiographical text, historians are not obliged either to accept or to reject the narrative in its entirety; they must instead examine each piece of evidence it provides, asking whether it is acceptable or not.

The claim that Zeno ordered the senators to build palaces, and "the archonts of Egypt" to build houses, in Abu Mena, and that the result of this was the emergence of a town, can be rejected with a high degree of confidence thanks to evidence from other texts as well as from archaeological

[3] The literary texts of the dossier concerning St Menas are quoted by me according to the conventions set forth by Przemysław Piwowarczyk (below, Chapter 3).

[4] Bibliographic information concerning written sources on the cult of St Menas is provided by Przemysław Piwowarczyk (below, Chapter 3); see also his recent study (Piwowarczyk 2025). In the following discussion, I will cite the *Miracula* texts, indicating both the editors' names and the numbers assigned by them.

research.[5] The claim about Timothy Aelurus being the person who supported the sanctuary together with Zeno is fictional. Zeno was emperor between 474 and 491, while Timothy Aelurus was patriarch in 457–460. He was in exile between 460–475 and then was reinstated between 475–476, at the time when Basiliscus temporarily usurped power from Zeno. It was Basiliscus who recalled Aelurus from exile. The statement that Zeno granted fiscal income from the "eparchy" to Abu Mena may be a distorted reflection of Justinian's decision to join the Mareotis to Libya Inferior in order for the taxes from this rich region to support the military in a rather poor province, which required a constant presence of the army.

Luckily, the other statements about Zeno's support of Abu Mena seem reliable. Other sources inform us that Zeno moved a regiment of soldiers to the Mareotis, which had been stationed in Alexandria (or rather in the vicinity of Alexandria) since 444. The regiment was the *numerus* called *devotissimi Theodosiaci Isauri*, bearing this name because it had been created by Theodosius. It is impossible to assess how numerous this regiment was. The Coptic *Encomium* states the number to have been 1200 soldiers, while the Arabic and Ethiopic versions vary from 3,000 to 123,000 soldiers. This is not unusual in the tradition of hagiographic texts: numbers often increase gradually, together with the number of copies and translations.

The Isaurians who were sent to Egypt took their families with them. When they were moved to Mareotis, they settled in the proximity of Philoxenite.[6] It was this Isaurian community that built the martyrion of St Thecla (a famous Isaurian saint) on the road between Philoxenite and Abu Mena. This martyrion is mentioned in connection with a miracle described in all collections of the *Miracula of St Menas*.[7] Ampullae for holy oil with images of Thecla[8] were produced in workshops in Abu Mena for devotees visiting the shrine. Another Isaurian saint, Conon of Bidana, is also depicted on ampullae and was probably venerated together with Thecla within the "Isaurian" martyrion.[9]

It is highly probable that mentions of the camp/settlement where the woman and children of the soldiers lived appear in ostraca found in Philoxenite.[10]

[5] I wonder where this idea arose from. We know that this is exactly what the governor of Egypt, Abd al-Aziz, did when, after the outbreak of the plague in 689/90, he decided to move from Fustat to Helwan: see the *History of the patriarchs* (ed. B. Evetts): 296–297. The bishops then, on the orders of the governor, built two churches. The only concern is that the expansion of Helwan (the settlement had already existed before, it also had its own bishop earlier) took place during the patriarchy of Simon I (689–701), so John III could not have been inspired by the idea of Abd al-Aziz. This would be an argument in favour of the idea that the *Encomium* was the work of John IV.

[6] This was established by Jean Gascou on the basis of the work by Cyril of Scythopolis, *The Life of St Sabas*, chapters 1, 9, and 25 (Schwartz [ed.] 1939: 87, 92, and 109 respectively). Sabas's father served in this unit and became its commander. Sabas travelled to Egypt when property issues had to be settled. The name of the regiment is attested in the document *P. Paramone* 15, 5–7 [592/3]. Gascou presented his thesis in the paper Gascou 2008: 70–71.

[7] *Miraculum* 3 (Pomâlovskìj), *miraculum* 4 (Drescher), *miraculum* 5 (Bacot). On this martyrion, see my paper Wipszycka 2024.

[8] A catalogue of the ampullae is in Davis 2001: 195–200. The author is convinced that the martyrion of St Thecla near Philoxenite and the ampullae with her image are testimony to the "itinerant ascetic women" movement. This idea cannot be accepted, as it is not supported by the sources (we have no evidence at all of the existence of wandering ascetic women in "real", non-literary reality). Gascou's thesis, instead, makes it possible to reasonably explain the circumstances in which this surely small martyrion was created, the appearance of which in this part of the Mareotis cannot be explained otherwise. See Wipszycka 2024.

[9] Publication: Witt 2000: 162, no. 52. A photo of ampullae with Saint Conon: Pilhofer 2018: 268; the same author published the *Life* of St Conon with an extensive study of his cult: Pilhofer (ed.) 2020.

[10] Derda and Wegner forthcoming. The managers whom the title of this study refers to executed works for the military *kastron*, as appears from *O. Marea* 1; 7; 8. For an extensive commentary on the activities of the units stationed in the Mareotis, see pp. 55–57 of the cited study.

The author of the *Encomium* claims that Zeno issued a steady subsidy for the sanctuary, which was paid from the revenues of the eparchies. This seems likely, but it was certainly not the entire revenue of the nearby "eparchies" that was destined to the sanctuary; it is also unclear what the author of the *Encomium* means by "eparchies" as in the terminology of Late Antiquity and from the beginning of the Arab period the term "eparchy" usually referred to a province. This lack of precision can be easily explained: in the genre of *encomia*, exaggeration was a normal rhetorical device.

Why did Zeno choose Abu Mena as an object of his patronage? In order to answer this question, I must first present an overview of the politics of the Eastern Mediterranean in the 570s and 580s.[11] Otherwise, it would be difficult to understand why it was Abu Mena that drew the emperor's attention.

Zeno was made emperor in 474. His rule was far from stable in the early stages. In the years 476–478, he had to face the usurpation of Basiliscus, who forced him to escape from Constantinople. Basiliscus's usurpation was not the only attempt to overthrow Zeno. Zeno recovered the imperial throne thanks to the support of Illus, the powerful leader of an Isaurian clan that had its own army. In return, Zeno had to grant him high military offices and accept his factual rule in the south-east part of Asia Minor and Syria. Both Zeno and Illus were gathering allies and forces for their inevitable military confrontation.

Among the important dignitaries from the East, as well as rulers within the Empire's sphere of influence (such as Odoacer in Italy and the rulers of Armenia), some decided to support Zeno, while others allied themselves to Zeno's enemies. In July 484, in Tarsus, Verina, the empress dowager and widow of Leo I, proclaimed Leontius the Isaurian emperor. Leontius was one of the men of Illus. However, in September of the same year, the army sent by Zeno achieved victory in Isauria, bringing the conflict to an end.

As Zeno prepared for war, maintaining control of Alexandria was of great importance to him. For this to succeed, he needed the support of the lay powers in Alexandria, as well as that of a patriarch who could check the religious conflicts taking place in the city. In 482, the Egyptian Church had two patriarchs: the Chalcedonian patriarch John Talaia and the anti-Chalcedonian patriarch Peter Mongus, who had been consecrated in 477 against the will of the imperial authorities and who had to serve his function in secret. Zeno quickly exiled John Talaia because of his connections to Illus. Instead, he recognized Peter Mongus, who was more likely to compromise. Peter was required to sign the doctrinal conditions listed in a letter from the emperor, the so-called *henotikon.* The letter was addressed to "the most devout bishops and clergy and monks and laity in Alexandria and Egypt, and Libya and Pentapolis". Peter was introduced as the legitimate patriarch to the populace of Alexandria with great pomp, in the presence of the new *augustalis* of Egypt, Pergamius, a man loyal to Zeno who took the post of the previous *augustalis*, who had been connected to Illus.[12]

Zeno is known to have initiated the building of many sanctuaries-martyria:[13] an architectural ensemble dedicated to St Thecla at Seleucia; smaller martyria in Isauria and Cilicia; one of the greatest sanctuaries of the Roman East, that at Qalat Siman, near the column of Simeon the Stylite.

[11] My discussion of Zeno was helped by the excellent book, Kosiński 2010, which is much more reliable and detailed than Crawford 2019.

[12] See Wipszycka 2015: 156–158.

[13] Kosiński 2010: 203–218.

It is relevant for the historian of Philoxenite that at the foot of the Qalat Siman hill, the existing settlement of Teleda was extended as part of the same building project. It became a large centre for pilgrims and included inns, baths, churches, and a monastery (the whole complex is now referred to as Deir Siman). On a small scale, Philoxenite played the same role as Deir Siman did to Qalat Siman.

The construction of a sanctuary dedicated to the popular Simeon the Stylite was aimed at fostering support in Syria, in particular Antioch, and to erase the memory of Illus. Zeno's behaviour here is analogous to his policies towards the Church of Alexandria. The analogy is still more striking if we consider that the emperor removed the pro-Chalcedonian patriarch of Antioch, Calandion, and allowed Peter the Fuller to return to the office of patriarch despite his ambiguous doctrinal attitude.

The establishment of the city of Philoxenite is attributed by the *Encomium* to the praetorian prefect named Philoxenus:

> And again, in the time of Anastasius, the king, pious zeal inspired the heart of the Praetorian Prefect since he too heard of the wonders and miracles wrought by the holy Apa Mena. And furthermore, he saw the hardships suffered by the many multitudes coming to the shrine. For, when they left the lake and entered upon the desert there, they found no place of lodgement or water till they reached the holy shrine. And the prefect built hospices by the lake and rest-houses for the multitudes to stay at. And he had the market-place established among them in order that the multitudes might find and buy all their needs. He had spacious depositories constructed where the multitudes could leave their clothes and baggage and everything which they brought to the shrine. When he had completed everything, he called it Philoxenité after himself. He also set up porticoes at different places where the people might rest. And he established watering-places along the roads, leaving at them water-jars, from the hospices as far as the church, at ten-mile intervals between one watering-place and another, for the refreshment of the people bringing gifts to the church (Drescher 1946: 71 [text] and 147–148 [translation]).

Philoxenus is a fully historical figure, known to us from various sources (see the following chapter in this book). His full name was Flavius Theodorus Philoxenus Soterichus. His career was largely due to the influence of Anastasius, and he also held the position of *magister militum per Thraciam* under this emperor (between 491–518). In 518, for reasons unknown to us, he was punished with exile; however, he was recalled at the beginning of Justin I's reign, who in 525 granted him the consulate in the East (three consular diptychs attest to this). No other source (apart from the *Encomium*) mentions that he was a praetorian prefect. The absence of this title on the consular diptychs should not overly concern us, as these did not typically record the full *cursus honorum* and usually noted only those offices that conferred the right to the title *vir illustris*. There is no doubt that the person mentioned in the *Encomium* is identical to the one who held the consulship in 525. The *Encomium* was composed later, at a time when the titles held by high-ranking Byzantine officials had long been forgotten in Egypt. Its author must have found this information in a source closer to the events described. It is certain that his name as the benefactor of Philoxenite was recorded somewhere, and it is likely that prayers were offered for him, with his name being read during solemn services from the diptychs, which every large church possessed. Whether this practice continued into the second half of the 8th century (assuming that

the *Encomium* was written by John IV) is unknown. The diptychs were subject to revisions over time, a fact that is well established.

Philoxenus was undoubtedly not only a high-ranking dignitary but also a man of considerable wealth (see the following chapter). Whether the emperor supported him in the construction of Philoxenite (i.e., whether he could draw upon tax revenues) remains unknown, although it is plausible.

The information provided in the *Encomium* about Philoxenus, while valuable and likely credible (as evidenced by the name Philoxenite appearing in several sources, indicating that the author of the *Encomium* did not fabricate it), does not align with the results of archaeological research. These findings suggest that the city of Philoxenite was established no earlier than the mid-6th century. By this time, Philoxenus had already passed away, and Justinian (died 565), rather than Anastasius or Justin I, was in power.

In my view, the only way to reconcile the discrepancies between the data from the *Encomium* and the archaeological findings is to consider Philoxenus as the financier of the earlier structures located on the promontory near an existing older church. These structures were demolished when the city, which emerged as part of a single extensive construction campaign, was built in the full sense of the term, complete with its street grid, port facilities, and churches. This city, associated with Justinian, is conspicuously absent from the *Encomium*. The account in the *Encomium* appears to have been manipulated, driven by the anti-Chalcedonian convictions of its author. Justinian could not be mentioned in the *Encomium*, not even as a chronological reference point, due to the intense hatred that the anti-Chalcedonians harboured for this emperor.

One point must be added. The author of the *Encomium* describes the work of Philoxenus while describing Philoxenite as a fully developed city, rather than the earlier settlement (or group of buildings) that existed before. This should not concern us, as the text utilized by Patriarch John likely did not contain precise information about the construction activities of Philoxenus. The image of Philoxenite, as presented by the author of the *Encomium*, was simply imagined in accordance with the conventions of fictional hagiography.[14] Therefore, we cannot assume, for instance, that the city had an agora or public hospices based on this account, as such features are not mentioned in the *miracula* texts.

The development of Philoxenite was also the effect of the town's role in the region's economy. Ships not only transported travellers to and from Abu Mena, they also carried wine, olive oil, vegetables, and fruits to Alexandria. The Mareotis, after all, was an important part of Alexandria's agricultural hinterland. Some of the inhabitants of Philoxenite were rich and helped fund various building projects: houses, baths, and even churches.

At the beginning of the 7th century Alexandria and its surrounding region were hit by hostilities. Some of the battles between the forces of Phocas and Heraclius (608–610) took place in the

[14] The fictional nature of the hagiography is primarily revealed by the use of stereotypical descriptions of the behavior of martyrs, their judges, and executioners. These descriptions are found in many hagiographic works, often in a fairly uniform linguistic form, and serve as ready-made elements for constructing the narrative. Scholars of hagiographic literature refer to these elements with the Greek term *topos* (plural *topoi*). Their presence, especially in large quantities, indicates that the author had no knowledge of the actual protagonists and therefore resorted to what was available in the narrative and lexical repertoire of the literature known to them, or what was conveyed by preachers speaking in churches. Another indication that we are dealing with a "fabricated" text is the presence of glaring errors in the depiction of events well known from other sources.

Mareotis. This interrupted the flow of pilgrims visiting Abu Mena.[15] The Persian invasion of 619–629 caused considerable damage; during its first phase, the plundering mostly hit churches and monasteries. The monasteries west of Alexandria were looted even before the conquest of the city; the monasteries near Nikiu suffered the same fate. Peter Grossmann supposed that the Persians caused severe damage to Abu Mena: according to him, this is proved by the evidence of a fire in the portico on the tribunal outside the north wall of the Tomb Church. He believed that this period was a turning point for the history of Abu Mena and argued that its architecture changed significantly at this time.[16] His theory does not find clear support in the archaeological material and has not been accepted by some of the specialists.[17] Historians, on the other hand, accepted it with enthusiasm. However, as written sources do not inform us of Persian activities in Abu Mena, historians do not have the last word on this matter. It is important to remember that fires were common in cities and could often occur under circumstances other than war. Of course, it is possible that the Persians looted the churches of Abu Mena and Philoxenite, but we do not have any compelling proof of this.[18]

Pilgrims or visitors?

In the title of this paper, I used the term "pilgrims" in accordance with the traditional way of speaking about people arriving in "pilgrimage sanctuaries". It was, however, simply a stylistic move as I did not wish to surprise readers who are accustomed to this term. "Pilgrim" is a problematic term for researchers working on the great sanctuaries of antiquity.[19] The first problem is that no corresponding term existed in any of the languages that were spoken at the time: Latin, Greek, Syriac, and Coptic. Literary texts record what would take place in great sanctuaries or *martyria*, but they would not differentiate between those who came to the shrine from afar, with the intention of visiting a holy place, from those who came from the vicinity of the shrine, and those who arrived by coincidence, while on a journey undertaken for other reasons (such as visiting family, economic activity, business trips and the like). Merchants from various parts of the

[15] We know about this from the chronicle of John of Nikiu, written at the very end of the 7th century, containing extremely valuable information which was based on local tradition and is not present in historiographic works and chronicles created outside Egypt. The most recent and most important study about this author is Booth 2011a; on military activity in Egypt during Heraclius's revolt, see pp. 588–601.

[16] Grossmann 1998: 296–298. On the Persian conquest and the Persian rule of Egypt, see Altheim-Stiehl 1991; Greatrex and Lieu (eds) 2002: 196–197 and 226–227; Sänger 2011.

[17] Lavan 2021: vol. 2, 269 (Appendix 1, C3), 810 (Appendix 2 S1).

[18] In order to give the reader an idea of what could have been the looters' prey, I will quote (in the translation by Wilkinson 1977, chap. 18, p. 83) a passage from an itinerary called the *Itinerarium of the Pilgrim of Piacenza* (dated 570), which describes things kept in the Church of the Holy Sepulchre in Jerusalem: "There are ornaments in vast numbers, which hang from the iron rods: armlets, bracelets, necklaces, rings, tiaras, plaited girdles, belts, emperor's crowns of gold and precious stones and the insignia of an empress. The Tomb is roofed with a cone which is silver, with added beams of gold". An edition of this *Itinerarium* was given by Geyer 1965: 126–153 and 157–174; the passage quoted by me is to be found (in two versions) at pp. 138 and 163. Of course, the Holy Sepulchre was vastly different from the basilica in Abu Mena, but the clergy of any well-guarded church had every reason to show visitors expensive items donated by pious donors, to encourage wealthy visitors with a good example. Churches were also decorated with expensive fabrics. The raiders had always something to take, and without much trouble, the treasures were at the soldiers' fingertips.

[19] Wipszycka 1995.

world of Late Antiquity came to Alexandria, especially in the 6th century, when the sanctuary of St Menas flourished, and trade between East and West was still intense. They had enough money and enough reasons to take the extra trip to the Mareotis and secure the grace of the saint. Officials, students, and soldiers also travelled to Alexandria, and all of them were potential guests of Abu Mena.

It is likely that people who we would refer to as "pilgrims" today experienced the sacral sphere in a specific way and were rather wealthy (as long journeys required serious financial resources), unless one was a member of a group of travelling ascetics who begged for food and a place to sleep. We cannot distinguish them from other kinds of people visiting Abu Mena or Philoxenite.

Abu Mena is commonly referred to as a healing shrine, which suggests that the main motive of visitors was prayer for healing. However, the sources indicate more complicated reality.

The "invention miracle" recorded in the *Encomium* is exactly a healing.[20] Other hagiographical texts talk of healing in more general terms, indicating clearly that this was the reason why the shrine drew pilgrims. We also have information about the healing properties of the oil from the lamp burning by the grave of the saint: "All who took away (some) of the oil of the lamp to distant lands received healing".[21] Only one *miraculum* mentions incubation in the church. The heroes of this story are a paralysed man and a mute woman: during the night St Menas appears to the paralytic and tells him to lie down next to a sleeping woman; when the paralytic finally manages to crawl towards her, she screams and he runs away, regaining his ability to walk. Unfortunately, this miracle is not unique to St Menas—the same *miraculum* can be found in the collection of *miracula* of Cosmas and Damian, which was its source.[22] The fact that there are no mentions of incubations in the *Miracula of St Menas* seems to me to be an important clue. Not all pilgrimage centres practised incubation. We should remember this when interpreting the role of the buildings in Abu Mena. Archaeologists usually assume that incubation in Abu Mena took place in the semi-circle, two-story building which opened onto the church complex with the grave of the saint. However, we do not have sufficient basis for this assumption.[23]

The *Miracula* clearly indicate that St Menas was invoked in various situations which had nothing to do with health problems. Visitors from far away, whose presence is revealed by ampullae, could ask for a safe journey, for the well-being of their families, or for successful business transactions.

The opinion of modern researchers on the motives of visitors to Abu Mena has been influenced by what we see in the stories of the *Miracula* of Sophronius, in which people gravely ill and whom doctors were unable to help go to the sanctuary of Cyrus and John at Canopus, near Alexandria. Of course, the authors of the *Miracula* chose topics which, in their opinion, were best suited to illustrate the various aspects of the power of the saint, without much concern about the actual motives of the sanctuary's visitors. Anyway, it is significant that the hagiographic texts concerning St Menas do not emphasise the healing motive. We should, therefore, be cautious in ascribing a religious function to the baths in Abu Mena, as Grossmann did.[24] In fact, the *Miracula* never

[20] Drescher 1946: 64 (text), 143–144 (translation).
[21] Drescher 1946: 144.
[22] *Miraculum* 5 (Pomâlovskìj); Deubner 1907: 162–164, *miraculum* 24. This miracle is attributed also to Saints Cyrus and John in the *Miracula* by Sophronius, *miraculum* 30 (see Boutros 2008: 139). On the different versions of the *miraculum* with the paralytic and the mute, see Devos 1980.
[23] Grossmann 1998: 288–289.
[24] Grossmann 1998: 292.

mention bathing as a way of healing. In the Mediterranean cultural sphere bathing was, after all, a regular activity which people were used to. Monks were the only ones to abstain from it.

Abu Mena is sometimes referred to as "the Lourdes of Antiquity". This does not seem justified to me. Lourdes emerged in the second half of the 19th century, in the times of easy, cheap transport by train, and of pilgrimages composed of large groups of people organized by various churches.

The number of visitors to Abu Mena was most significant on three days: 11 November (15 Hathor)—the day of the martyrdom of St Menas, commemoration of the invention of the saint's relics, and commemoration of the consecration of the Basilica. The sources differ in locating the two last feasts in the calendar, but one of them was certainly at 15 Paone (9 June).[25] The patriarch of Alexandria and his retinue would take part in the festivities, especially in the celebrations on the day of St Menas's martyrdom. Let us remember that November was not a good month for visitors coming from outside of Egypt as the sailing season was over (it would start again only in March).

I assume that Philoxenite, with its splendid basilica, was the first stop during the journey of the Alexandrian patriarchs to Abu Mena.

The roads to Abu Mena

In the rare cases when the *Miracula of St Menas* actually say something about the road by which travellers would travel to Abu Mena, they mention the route over the lake, a stay in Philoxenite, and an approximately 20-kilometre journey through the desert. It would be worthwhile to list the topographical information we can gather from these sources.

Travellers from Alexandria would board a ship in the port on the lake in the morning, at breakfast time. The journey would then take a day, which probably means until dusk;[26] in the *miraculum* "The Samaritan Woman" (Pomâlovskìj 6; Drescher 16), the women reach Philoxenite in the evening. The *Miracula* mention numerous ships docked in the Philoxenite harbour and provide a detailed account of the process of docking the ship. One of the *miracula* (Jaritz 13) tells about a delegation from Abu Mena that goes to Alexandria to receive wood donated to the sanctuary; it does not say which port the ship was headed to after picking up the cargo, but it was most probably Philoxenite.

The information on Philoxenite contained in the *Miracula* is of a very general nature. Philoxenite is described as having a square[27] and private guesthouses.[28] No church is mentioned.

Instead of stopping in Philoxenite on the way, travellers could find a place to sleep in a *xenodocheion* located on the road to Abu Mena, around 2 km from the town. There were other *xenodocheia* along the lake. The Greek text recounting the miracle concerning the Samaritan woman mentions a *xenodocheion* by the lake, which was located half-way between Philoxenite and Abu Mena.[29] In the *miraculum* "The Isaurian Pilgrim" (Pomâlovskìj 1; Drescher 2; Bacot 3) the Isaurian

[25] Coptic *Encomium* gives: 15 Hathor (11 November), 15 Paone 15 (9 June), 1 Epip (25 June); Arabic version: 15 Paone (9 June), 17 Thout (14 September), 15 Hathor (11 November).

[26] *Miraculum* 2 (Pomâlovskìj).

[27] *Miraculum* 4 (Pomâlovskìj) = *miraculum* 8 (Drescher).

[28] *Miraculum* 16 (Drescher).

[29] *Miraculum* 6 (Pomâlovskìj): Ἔφθασεν δὲ αὐτὰς ἑσπέρα μέσον τῆς ὁδοῦ καὶ ἔκαμψαν εἰς τὸ ξενοδοχεῖον τὸ πλησίον τῆς λίμνης (Pomâlovskìj 1900: 75).

of the story takes shelter at a random private house because—as the text tells us—further on the road led through uninhabited lands. This means it could not be in the near vicinity of the lake.

It is important to remember that the road through Philoxenite was not the only way of reaching the sanctuary of Abu Mena. Visitors from Libia Inferior could travel by land, along the shore of the Mediterranean Sea, then turn south, towards the road to the sanctuary. This route may be the one recorded in a *translatio* narrative preserved in the *Encomium*:

> And, leaving Alexandria, they put the saint on a ship of Lake Marea. They came westward on that day to the Taposiriac Taenia. They put him on a camel and brought him first to Kobio, a village of Mareotis. And when, by the grace of God and His holy Martyr, they defeated the barbarians, they brought his holy remains to the village of Este (Drescher 1946: 61 [text] and 141 [translation]).

The account looks like a list of stations on a pilgrimage route going from Alexandria to Taposiris Magna and along the western shore of the Mareotis Lake through some small locations to Abu Mena. A pilgrimage station in Libya is recorded in a *miraculum* dealing with an unjust rich man who failed to fulfil his promise of offering pigs for the agape organized in the sanctuary and who was then punished by St Menas.[30]

We do know that the road along the southern coast of the Mareotis Lake was also available. It could have been used by people who lived in the east of the region, perhaps also by people living in the western Delta. There were also travellers journeying through the desert: Abu Mena and Kellia were important spots where desert roads, frequented and busy in Late Antiquity, met.[31]

Many (perhaps most) of the visitors travelling from Philoxenite to Abu Mena would have hired out donkeys or camels. Although the *Miracula* do not mention such issues, we can guess that beasts of burden were necessary to transport baggage: mats, blankets, mattresses, and cooking utensils. Even those travellers who stayed at the *xenodocheia* of Abu Mena probably had to bring such items with them. Vessels with water would also be needed. Archaeologists have not found signs of stables for pack animals in Philoxenite or Abu Mena, but it seems obvious to me that such must have existed.

If the journey from Philoxenite to Abu Mena was carried out by donkey, it would take two to three hours. On foot, the journey would have lasted longer. During the hot months, it was certainly uncomfortable. At least one watering-place was built to provide water for travellers through the desert.[32]

[30] *Miraculum* 2 from Ms. Pierpont Morgan M. 585 in Drescher 1946: 159.

[31] See a passage of one of the stories of Daniel edited by B. Dahlman (2007: 173)—a passage concerning the route from Abu Mena to Sketis: "let us go and travel all night and tomorrow until the sixth hour, in order to arrive before the great heat of the day".

[32] The *Encomium* mentions this in the part which records the activities of Philoxenus: "And he established watering-places along the roads, leaving at them water-jars [*hydriai*—but the author probably meant cisterns, as Drescher observes in a footnote *ad loc.*] from the hospices as far as the church, at a ten-mile interval between the one watering-place and another, for the refreshment of the people bringing gifts to the church" (Drescher 1946: 71 [text], 148 [transation]). The information is inaccurate as the distance between Philoxenite and Abu Mena was about 18 km, so there was no room for more than one watering-place. This is an important detail: it proves that the author—if we assume that this passage was written by Patriarch John—travelled through this place without stopping and did not have the opportunity to look at or use the device (maybe it was no longer working...). Maybe an editor or a copyist unfamiliar with the area embellished the text: this sometimes happens in the course of the manuscript tradition.

The Miracula on the visitors to Abu Mena

The *Miracula* list various types of people visiting the shrine, as is typical of this literary genre. They only once mention a merchant from outside of Egypt: an Isaurian who arrives in Alexandria and uses the opportunity to visit Abu Mena (Pomâlovskìj 1; Drescher 2; Bacot 3). There is also a pagan (Bacot 2), and a Jewish merchant—a character who is, quite surprisingly, described as a very amiable and just person (Pomâlovskìj 4; Devos). There is also a Jew who came to ask for healing for his son, who was possessed by an evil spirit (Jaritz 1), and a Samaritan woman from a good family (Pomâlovskìj 6; Drescher 16). These two were both from Alexandria. Jews figure frequently in the *Miracula*, and in cases when they obtain a miracle, they often convert to Christianity. There also appears an inhabitant of the Marmarike (Pomâlovskìj 8).

Rich people figure in the *Miracula* relatively often: an owner of a horse (Drescher 6; Bacot 2); a rich man from Alexandria (Pomâlovskìj 2; Drescher 3; Bacot 4); a rich woman from Philoxenite (Pomâlovskìj 4; Drescher 4; Bacot 5); a rich Samaritan woman (Pomâlovskìj 6; Drescher 16); a rich man from Libya (*miraculum* 2 from Ms. Pierpont Morgan M.585, ed. Drescher); a camel-owner (Pomâlovskìj 9; Drescher 1); a donator of expensive wood to the sanctuary (Pomâlovskìj 11; Jaritz 13). This category of visitors, if they were not notoriously burdened with sins, did credit to the local Christian communities; therefore, hagiographers mentioned them with a special emphasis. It is possible, however, that the high proportion of rich people among the visitors mentioned in the *Miracula of St Menas* conforms with the reality. The journey to Abu Mena was expensive: one needed to pay for accommodation and give a customary offering to the saint. Failing to provide an offering would have been a source of shame for people venerating the saint and made them doubt whether their act could bring them any advantage.[33]

There are two instances of the poor appearing in the *Miracula*, in one of them a humble brick maker from Alexandria whose family is in danger of starvation. He belonged to a team of craftsmen who were brought to work on the church in Abu Mena, which explains his presence in the sanctuary. A man like this, pious, full of humility, quiet yet distinguished by the saint, was clearly in the right place in a collection of *miracula*.[34]

The miracle involving a rich woman from Philoxenite who travelled to Abu Mena in order to offer her jewels to the saint and who was attacked in the desert by a mounted soldier from a unit guarding the region (Pomâlovskìj 3; Drescher 4; Bacot 5), merits some comment. The authors of the *Miracula* needed to include such a miracle, which gave them an opportunity of presenting St Menas as saving an innocent woman whom no one else would have been able to help. The author(s) clearly did not have a problem with the fact that the depicted story was fictious. In antiquity, women, especially rich women, and carrying valuables, would not risk the dangers of a journey through the desert all alone. The possibility of rape and robbery was very high.

[33] The choice of rich people as the characters of the *Miracula* is notable, especially when comparing the dossier of St Menas to the dossier of St Cyrus and John, in which, out of 50 descriptions of miracles in relation to the inhabitants of Alexandria and the Egyptians, only 12 mention that the healed were rich (I do not take into account 19 foreigners, they must have had material resources enabling them to travel long distances).

[34] Ms. Pierpont Morgan M. 585 in Drescher 1946: 150–159; cf. another worker in Arabic *miraculum* 1 (transl. Jaritz 1993: 161–162).

Another miracle involving a woman is more realistic. A Samaritan woman travels with a group of Christian women to the sanctuary, to ask the saint to cure her of her terrible headaches (Pomâlovskìj 6; Drescher 16). She and her companions travel in a ship through the lake, and then by land.

In the Greek and Coptic *Miracula of St Menas*, there are no instances of women praying for pregnancy. In reality, there must have been many such women in Abu Mena, as is evidenced by the numerous clay figurines of pregnant women found in this place.[35] Of course, the *Miracula of St Menas* are but a small collection of stories; it is, nonetheless, surprising that none of the miracles described in them mentions women who were granted children by the saint. There is one story (Pomâlovskìj 3; Drescher 4; Bacot 5) about a rich woman from Philoxenite who, having no children, decides to donate all her riches to St Menas (I alluded to it above); an Arabic author (Jaritz 9) changed the story: in his version the woman gives birth to a son, who receives the name Menas in honour of the saint. The story thus becomes more banal—the earlier version focused on the rescuing of the woman's virtue, and her gift was to ensure her happiness in the afterlife.

Among the people mentioned in the *Miracula*, very few come from the proximity of Abu Mena. This cannot reflect reality. The inhabitants of the Mareotis certainly took part in the festivities in Abu Mena, they might even have been the majority among the visitors. The Mareotis was densely populated and rich; there seems to be no particular reason why its inhabitants would have been indifferent to the cult of a famous saint. It is also worth noting that people from the Mareotis would not have to travel to Abu Mena using the route from Philoxenite: they could reach the sanctuary by land, following the roads along the lake.

It is impossible to estimate how big the number of visitors was. Literary texts tended to overestimate the number of visitors (similarly to how they would exaggerate when listing the countries from which the visitors would arrive). We can get some idea (though not precise numbers) of visitors by considering the area of Abu Mena which was intended for visitors: the size and number of *xenodocheia*, of shops on the main street, and of baths can help us give a rough estimate. This infrastructure could have been used by hundreds of people at once. But it is unlikely that it could have been thousands. It is hard to imagine hundreds of barges arriving at the same time at Philoxenite, or thousands of people travelling together to Abu Mena using the land routes.

Ampullae as evidence of the visitors to Abu Mena

Another source of information about the visitors to Abu Mena is the so-called "ampullae (flasks) of St Menas".[36] They are small, flat, oval bottles with handles to which a string or a thong could be attached to wear the ampulla on one's neck. Such ampullae were produced in workshops in Abu Mena. They were made out of local clay and were usually decorated with images of St Menas

[35] Frankfurter 2014.

[36] Approximately 800 of them were discovered (at least). They were published in various articles before the discovery of Abu Mena. Recent catalogues and important studies: Metzger 1981; Kiss 1989; Lambert and Pedemonte Demoglio 1994 (it is primarily a catalogue of ampullae published up to that date, according to where they were found; it contains information about the place of storage and publications); Kaminski-Menssen 1996; Witt 2000; Gilli 2002 (a penetrating study based on 742 items); Anderson 2007; Bangert 2007.

(sometimes, rarely, of other saints). Many had Greek inscriptions: Εὐλογία τοῦ ἁγίου Μηνᾶ, or Εὐλογία τοῦ καλλινίκου ἁγίου Μηνᾶ (or other, similar versions).

There is no consensus among scholars as to whether the ampullae contained water or olive oil. It seems to me that water is the less likely option. Neither the *Encomium* nor other Coptic Greek *miracula* make any mention of a sacred spring or well located near St Menas's grave. *Miraculum* Drescher 17 (= Jaritz 16) does mention that during a drought, St Menas's intercession made the archangel Michael appear. He struck a rock with his staff and "water poured forth to a depth of three ells and for a distance of a mile". However, this does not suggest that this spring later continued to exist (Abu Mena's water was ensured through a cistern and wells; some was also brought by camel from the lake).

On the other hand, the *Encomium* states that a lamp burned constantly in the room where the sarcophagus stood and that "all who took away oil of the lamp to distant lands received healing" (Drescher 1946: 65 and 144).

The lamps burning near St Menas's grave were not the only source of the oil, however, archaeologists discovered, *in situ*, a complex device which was used to provide the oil. An alabaster crater had been placed in a small cavity dug near the holiest spot where the sarcophagus stood. The cavity was closed by a marble slab with an opening 5 cm in diameter. The crater was placed precisely under it. By analysing the residues covering its interior researchers found out that it was used to collect oil poured through the opening. Obviously, the oil was thought to gain holy properties through contact with the earth in which Menas's grave was (rather than through direct contact with the saint's body). The oil was then drawn by inserting thin pipes through the opening. We do not know whether it was the faithful or the sanctuary's personnel who drew out the oil. Inside the crater, researchers also found coins that had become a compact mass weighing 6.5 kilograms. We cannot know how these kinds of gifts were conceived of by those who made them. It seems there was no way to withdraw the money, as the marble slab was attached permanently. This proves that the gifts were not donations for the sanctuary itself.[37] The most recent of the coins was from the reign of Anasthasius (491–518). I suppose that the device described above was not used often: taking oil from lamps was much easier.

We do not know how the sanctuary's guests would have acquired the ampullae of holy oil: did they receive them from the personnel of the sanctuary when they presented their gifts to the monastery, or did they acquire the ampullae from local potters and then ask the servants for oil to fill them? The differences in dimensions of the discovered ampullae (7.5 to 27 cm) suggest that there were special versions for the richer or more important guests who wanted larger amounts of the holy oil.

St Menas's ampullae were sometimes carried far away to distant regions around the Mediterranean and the Black Sea, even in Britain.[38] In the eyes of scholars of maritime trade and transportation history, these findings serve as evidence of direct relations between Alexandria and the locations where they were discovered. However, during an archaeological congress held in Bonn in 1991, some researchers contended that the extent to which ampullae had been transported by pilgrims had been greatly overestimated. Detailed examinations of museum catalogues revealed that

[37] Grossmann 1989: 64–68. See also Witt 2000: 68–69.
[38] Bangert 2010.

these artifacts were often recorded simply as originating from "Egypt". This is entirely understandable, as donors who brought these items to museums typically had no knowledge of the specific locations or archaeological contexts in which they had been unearthed. Consequently, we are now unable to distinguish between ampullae found "in the ground" and those acquired by donors through antiquarian trade. Indeed, even museums sometimes expanded their collections in this manner. Nevertheless, only those ampullae recovered from the ground (ideally during excavations) provide us with the assurance that they were brought to those locations by travellers who obtained them in Abu Mena. It is important to consider that during the first excavations at Abu Mena, conducted in the early 20th century by Karl Maria Kaufmann (who discovered the sanctuary), a large number of ampullae were found *in situ*, some even in pottery kilns. Many of these ampullae, whether acquired legally or illegally, eventually made their way to Alexandria, where antiquarians and even market vendors sold them at low prices to tourists interested in antiquities. Despite all these methodological reservations, there is no doubt that the ampullae travelled widely.[39]

As regards the fate of the ampullae outside of Egypt, yet another remark is necessary. We have every reason to believe that the ampullae may have changed hands as gifts or purchases. Therefore, if we know where an ampulla was found, we cannot be sure that the owner who brought it to that place had visited the sanctuary.

Ampullae found in Egypt, outside of Abu Mena, should be considered separately.[40] Twenty such ampullae were found in Philoxenite during the work of Polish archaeologists in the site. Many others were found in Alexandria. 142 ampullae discovered during the excavations in Kom el-Dikka have been dated by Zsolt Kiss on the basis of the archaeological layers to which they belonged.

In her book, Monica Gilli was the first to ask what kinds of circumstances could explain the presence of St Menas's ampullae in Alexandria. Some ampullae could perhaps have been lost by travellers who had visited Abu Mena. Others could have been brought from Abu Mena by Alexandrians and kept in their homes. Maybe the sanctuary (according to Gilli) was selling ampullae to people in Alexandria who could not make the journey to Abu Mena? If so, were ampullae purchased with money considered to be as effective as those acquired during a visit to the sanctuary? These questions cannot be answered, but are nonetheless worth asking.

The list of the St Menas ampullae reported to have been found in places of the Egyptian *chora* is astounding because of how short it is. In the western part of the Delta, one ampulla was found in Naukratis,[41] another one in Kellia.[42] For Middle Egypt, Lambert's list does not mention any ampulla. It does mention a few ampullae as having been found in towns of the Thebaid: two ampullae in Antinoe, three in Panopolis (Akhmin),[43] and two in Apollonopolis Magna (Edfu). All these "southern" ampullae are as suspect as those that are kept in European museums, for we have

[39] Please refer to the maps of findings in the works cited above (note 36), particularly in the studies by Bangert 2007 and Anderson 2007.

[40] Here my remarks are based on the lists made by Lambert and Pedemonte Demoglio 1994.

[41] Thomas 2018: 23–24.

[42] Bridel and Sierro (eds) 2003: 458. At the same time, we know that in Kellia there were numerous vessels which had been produced in Abu Mena (Bonnet Borel 2013: 165–166). This seems to prove that the monks of this monastic centre were not interested in pilgrimage to the sanctuary of St Menas.

[43] The catalogue lists them as coming from R. Forrer's excavations in the Panopolis necropolis. However, this information is inaccurate: these ampullae were purchased from antiquities dealers. This has been proved by Ádám Bollók, who found the papers of Forrer, an amateur archaeologist far from being reliable: see Bollók 2018: 763–770.

no reliable information about their provenance. They could have found their way to the towns of Upper Egypt through travellers in the 19th and 20th centuries.

Certainly, Lambert's catalogue, compiled 30 years ago, is incomplete, as artifacts published in local journals, which are not easily accessible, could have escaped her attention. Moreover, we have to take into account the possibility that ampullae badly preserved in fragments and discovered during excavations or land surveys have not been identified. However, even if we extended the list of "Egyptian" ampullae, it should be stated that Egyptians (in the sense of inhabitants of the *chora*: I am not referring to ethnicity) were rarely guests of Abu Mena. This fact is all the more unexpected as the cult of St Menas was popular in Egypt since the 6th century, as is shown by the data gathered by Arietta Papaconstantinou from papyrus documents and inscriptions, the best sorts of source material for research into the cult of saints.[44] The oldest document she quotes comes from the end of the 5th century (*P. Alex.* 209). The cult must have spread through literature, and personal presence at the burial place of St Menas was of minor importance to this process. This is quite surprising as, after all, the inhabitants of the *chora* flocked to Alexandria in great numbers. Monks travelled there, but no ampullae were found in monastic centres such as Saqqara, Bawit, the convents of the Shenutian federation, Western Thebes, and Esna.

It is worthwhile to compare the information about the visitors to Abu Mena provided by the *Miracula* and the ampullae with the information about visitors to another sanctuary close to Alexandria, that of Saints Cyrus and John. The *Miracula* written by Sophronius describe 70 cases; of these, 35 concern Alexandrians, 20 concern foreigners from outside Egypt, and 15 concern Egyptians and "Libyans" (that is, inhabitants of the Mareotis). Of the latter group, only one person came from Antinoe, the rest were residents of the Delta.[45] The differences between the categories of visitors seeking healing are so great that we can consider them significant. They show that both sanctuaries, that of St Menas and that of St Cyrus and John, were absent from the pastoral practice of the Christians of Middle and Upper Egypt.

Studying pilgrimages, David Frankfurter drew attention to a characteristic feature of cult activities of the Egyptians, which helps us understand why they were almost absent in Abu Mena and Menuthis.[46] In pre-Christian times the circles of the worshippers of a particular deity (I am referring to ordinary people, leaving priests aside) were limited to the immediate vicinity of a temple. Deities also travelled short distances to visit other deities, worshipped in other temples. In Christian times, when the rapidly developing cult of martyrs gave rise to *martyria* and to the custom of celebrating feasts in them, worshippers from a pretty close vicinity would gather there. St Menas was, as we well know, worshipped in churches all over the *chora*, and yet people do not seem to have felt the need to travel to the distant sanctuary in the Mareotis, although the clergy serving these churches used *miracula* embedded in the realities of the Mareotis. Alexandria and its hinterland constituted a separate, different, and distant world. The inhabitants of the *chora* were satisfied with local places of worship of St Menas.

[44] Papaconstantinou 2001: 146–154.

[45] Three inhabitants of *ktema Herakleion* near Menuthis, three inhabitants of the Mareotis, two of Nikiu, one each of Thenneseos, Kynopolis, Pelusion, Aphnaion, Metelis. Only one has an Egyptian name, Piamôth, and Sophronius does not say where he came from.

[46] See Frankfurter 1998, extensive introduction to a volume edited by him. A new version of this text appeared in a book in honour of Pierre Maraval (Frankfurter 2006).

Were the visitors to Abu Mena Chalcedonians or anti-Chalcedonians?

In the *Miracula* we find no information as to the dogmatic preferences of the Christians who were granted a miraculous intervention of St Menas, despite the fact that Abu Mena flourished in a time when Christological debates were taking place with great intensity and aroused much passion. The authors of the *Miracula* apparently did not think it fit to mention these conflicts. Their silence on this subject is a significant fact. I think it allows us to assume that visitors to Abu Mena followed various Christological options and that the clergy who welcomed them at the shrine did not distinguish between Chalcedonians and anti-Chalcedonians.[47] This is understandable: the clergy were vitally interested in ensuring that the number of people arriving was as large as possible, not only for economic but also for religious reasons. Pilgrimage shrines were usually open to Christians of various options, and even to people of various religions. In the religious consciousness of ordinary people, the saints were above the divisions, although theologians (such as Sophronius mentioned above) tried to impose a different view.

On the other hand, the clergy who served at the sanctuary might, or perhaps even must, choose a side. All of the clergy working in the Mareotis had to be ordained by the patriarch, and it was he who appointed a man, whom he chose himself, for the position of *oikonomos* of the sanctuary. In times of dogmatic conflict he likely selected him from among the people of his own dogmatic option. During mass, the names of the bishops (alive and dead) with whom the celebrant was in communion were read from the diptychs. We do not know whether the entire team of the sanctuary always changed when the new patriarch held different dogmatic views than his predecessor. The *oikonomos* of Abu Mena must have been a powerful dignitary; it is not inconceivable therefore that he could maintain independence from his superior (Chalcedonian or not) and pursue his own policy.

Peter Grossmann was convinced that at an unspecified moment, the Monophysites had built a separate church in Abu Mena, the so-called North Church, with a baptistery for their followers.[48] He based his view on the fact that this complex is located a little further off from the town. I do not find this convincing, however. Those who funded the construction of a rather impressive church with a baptistery may have chosen the site for a reason that was not the desire to separate themselves from the heretics. Grossmann exaggerates (not only in this case) in assessing the depth of doctrinal divisions. In his opinion, these divisions made it impossible for people of different doctrinal options to conduct pastoral activity in the same area, or even to live in the same settlement. This is not true. We know, for example, that in the great monastic complex of the Enaton, groups of people with different views coexisted with each other.

The issue of doctrinal divisions within Alexandria itself was far more complex than Grossmann believes. If we look at the table of the patriarchs of both options, we can see that from 482, when the anti-Chalcedonian Peter Mongus became the sole leader of the Egyptian Church, until 538, none of the professed Chalcedonians succeeded to the Alexandrian throne. It is therefore likely that Abu Mena clergy at the time was more or less anti-Chalcedonian. Only after the anti-Chalcedonian Theodosius was exiled from Alexandria, Paul the Tabennesiote was installed. With him

[47] Booth 2011b.
[48] Grossmann 1998: 295.

began a line of Chalcedonian patriarchs who had the support of the imperial administrative apparatus. It was these Chalcedonians who nominated the *oikonomoi* who ruled the sanctuaries and nominated the rest of the staff.

In the period following the Arab conquest, probably at the time of patriarch John III, the Monophysites took control of Abu Mena.[49] Grossmann believed that this led to a change in population too: the Chalcedonians ("the mainly Greek or Graeco-Egyptian population") emigrated, and in their place came the Copts.[50] This idea should be rejected. It seems highly unlikely that craftsmen, merchants, and various other workers would have left their homes and emigrated only because the sanctuary's *oikonomoi* began to be appointed by an anti-Chalcedonian patriarch. We know nothing of persecutions organized by anti-Chalcedonians against ordinary lay people. On the contrary—patriarch Benjamin, an anti-Chalcedonian, even proclaimed the need for an agreement with the Chalcedonian bishops. We do not have even the slightest evidence of priests, deacons, or lower clergy being removed from their churches because of their dogmatic option. At the lowest levels of the social ladder, the quarrels between the hierarchies of the rival churches must have been unnoticeable. Grossmann took at face value the vision of very hostile relations between Chalcedonians and anti-Chalcedonians, which was propagated by the anti-Chalcedonians only later, at the turn of the 7th and 8th centuries, in an attempt to build a new image of the past of Egyptian Christianity.[51]

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[49] For a time, the Chalcedonians retained their influence among the Arabs ruling Egypt. We know that the Mareotis was under the authority of the representative of this Church, Theophanes. We do not know what prompted the governor of Egypt to rapidly change his policy towards the rival churches. See Swanson 2010: 12.

[50] Grossmann 1998: 297. Sophronius calls the inhabitants of Mareotis "Libyans" (*miracula* 40 and 45). Their ethnic identity is confirmed by *ostraca* found in Abu Mena, belonging to the accounting dossier of works at the grape harvest. Three workers are called *Aigyptioi*, "Egyptians", in this way they are distinguished from the other workers (there are some other inhabitants of the Delta; in their case the accountant knew more precisely where they came from, in the case of the three *Aigyptioi* he did not know it): *O. Abu Mina*: 45–46.

[51] As shown by Booth 2021. I am afraid that many years will pass before researchers begin to treat the history of the Christological conflict in Egypt with greater caution. The vision of two doctrinal options fighting to the death is firmly rooted in 20th-century historiography, to such an extent that source texts which contradict this image are just ignored. See my discussion in Wipszycka 2015: 415–438 as well as in the article Wipszycka 2017.

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Chapter Two

FLAVIUS THEODORUS PHILOXENUS SOTERICHUS: THE FOUNDER*

Tomasz Derda

For centuries, the pilgrimage station erected on the southern shore of Lake Mareotis, serving those *en route* to the sanctuary of Saint Menas, retained a name derived from its founder Philoxenus, as evidenced by local Coptic sources (see Piwowarczyk in this volume). The name Philoxenite must have been deeply embedded in the consciousness of those who composed and copied the *Miracula* and *Encomium of St Menas*, even though archaeological evidence clearly indicates that "Marea"/Philoxenite was abandoned in the 8th century (Gwiazda 2023).

The toponym Philoxenite is attested primarily in Coptic sources. It also appears in the Greek *Miracula*, which predate the Coptic versions, although the extant Greek manuscripts are late and transmit the name in distorted forms (see Piwowarczyk 2025). The name likewise occurs in texts derived from Coptic, including Arabic and Ethiopic sources. However, it has not yet been attested in the relatively limited number of documents recovered from the site so far.

It should be noted that the name is not formed according to the morphological rules of the Greek language: from the personal name Philoxenos, the expected toponymic form would be Philoxenis (Φιλοξενίς), analogous to Theoxenis derived from Theoxenos. The altered form may have originated during its transmission into Coptic and subsequent adaptation to the phonological and morphological patterns of that language.

At present, none of the the documents (ostraca) discovered at the site preserve a Greek form of the toponym that can be confidently dated to the 6th or 7th century, i.e., the period when the city was still inhabited. Future discoveries, however, may well prompt a reassessment of the linguistically problematic form Philoxenite.

Sources

According to the *Encomium of St Menas*, the city of Philoxenite was founded by the praetorian prefect Philoxenus during the reign of Emperor Anastasius. He established hospices and rest-houses near the lake, created a marketplace to serve the needs of pilgrims, and constructed storage facilities for their belongings. The city was named Philoxenite after its founder, who sought to provide the necessary infrastructure for pilgrims on the way to the sanctuary of St Menas (see Wipszycka in the present volume, where a substantial passage from the *Encomium* is quoted; see also Wipszycka 2012).

At first glance, the account appears somewhat suspicious and evokes associations with a literary *topos*: a high-ranking official bearing a meaningful name ("the one who loves strangers/guests") cares for pilgrims and travellers arriving from across the Roman world to the sanctuary of St Menas.

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In this case, however, it is possible to identify the historical figure who likely established the pilgrimage station and harbour. He appears to have financed the construction of the oldest part of the settlement from his own resources. Flavius Theodorus Philoxenus Soterichus (Martindale 1980 [*PLRE* II]: 879–880, Philoxenus 8) belonged to the highest echelons of the imperial elite and was one of the most prominent figures on the political stage of Constantinople during the reigns of Anastasius (491–518) and Justin (518–527). He is mentioned by Malalas (Joh. Mal. 411) in his account of events from the early years of Justin's reign.

> Ὁ δὲ αὐτὸς βασιλεὺς (i.e., Justin) ἀνεκαλέσατο τὸν πατρίκιον Ἀππίωνα καὶ Διογενιανὸν καὶ Φιλόξενον, ὄντας συγκλητικούς, ἐν ἐξορίᾳ πεμφθέντας παρὰ τοῦ πρὸ αὐτοῦ βασιλέως· καὶ ἐποίησεν Ἀππίωνα ἔπαρχον πραιτωρίων καὶ Διογενιανὸν στρατηλάτην ἀνατολῆς, καὶ Φιλόξενον δὲ μετὰ χρόνον ἐποίησεν ὕπατον.
>
> The emperor (Justin) recalled the patrician Apion and also Diogenianos and Philoxenos, who had been sent into exile by the previous emperor. He made Apion praetorian prefect and Diogenianos *magister militum per Orientem*. Some time later he made Philoxenos consul (tr. Jeffreys, Jeffreys, and Scott 1986).

The *Chronicon Paschale*, which is dependent on Malalas, reports the events as follows (*sub anno* 519):

> Ὁ δὲ αὐτὸς βασιλεὺς ἀνεκαλέσατο τὸν πατρίκιον Ἀπίωνα καὶ Διογενιανὸν καὶ Φιλόξενον, ὄντας συγκλητικούς, ἐν ἐξορίᾳ πεμφθέντας παρὰ τοῦ πρὸ αὐτοῦ βασιλέως. καὶ ἐποίησεν Ἀπίωνα μὲν ἔπαρχον πραιτωρίων, Διογενιανὸν δὲ ἀπὸ στρατηλατῶν ἀνατολῆς, καὶ Φιλόξενον μετὰ χρόνον ἐποίησεν ὕπατον (ed. Dindorf 1832: 612).
>
> The same emperor recalled the patrician Apion and Diogenianus, a former *magister militum*, and Philoxenus, himself too a former *magister militum*, who had been sent into exile by the previous emperor. And he made Apion praetorian prefect, and Diogenianus former *magister militum per Orientem*, and after a time he made Philoxenus consul (tr. Whitby and Whitby 1988).

As Michael and Mary Whitby pointed out in their note to the quoted passage, the *Chronicon Paschale* likely confuses some of the titles: Malalas refers to Diogenianus and Philoxenus as senators, not former generals, and states that Justin appointed Diogenianus as *magister militum per Orientem*. We do not know when or why Philoxenus and Diogenianus were sentenced to exile (Martindale 1980 [*PLRE* II]: 362, Diogenianus 4; and 879–880, Philoxenus 8), nor whether their exile was in any way connected to the expulsion of Apion in 510, who was subsequently forcibly ordained as a priest in Nicaea (Martindale 1980 [*PLRE* II]: 111–112, Apion 2).

Consulate (East) of 525 and consular diptychs

Recalled to the capital by Justin at the very beginning of his reign, Philoxenus was appointed consul of the East in the year 525 (Bagnall et al. 1987 [*CLRE*]: 585)—thus indeed "after a time".

This consulship is attested by three so-called consular diptychs, bearing inscriptions that significantly enrich our understanding of Philoxenus's political career. These masterpieces of art—small ivory diptychs—were, from the late 4th and early 5th centuries onward, commissioned and distributed by members of the Roman elite to mark their assumption of office and the accompanying public games. Since the vast majority of surviving examples commemorate consuls (beginning with Anicius Probus, consul in 406), these luxury objects are conventionally, though somewhat imprecisely, referred to as consular diptychs (Cameron 2013; Delbrueck 1929 adheres to this imprecise terminology in his monumental corpus of all known examples at the time; on the diptychs of Philoxenus, see also Vasiliev 1950: 133–134, with extensive bibliography in note 32).

An ivory diptych consists of two carved panels joined by a hinge or clasp, allowing it to be closed like a codex. The interiors are undecorated and smoothly planed, with a raised edge surrounding the surface [see ***Fig. 4***], designed to be filled with a thin layer of wax. It is possible that an original message was incised on the inner surfaces, although no traces of any text written on wax—nor even of the wax itself—survive in the extant examples (Eastmond 2010: 743–744). The decorated exteriors formed the diptych's covers, with the front cover on the right and the back one on the left in the photographs taken while the object is unfolded. The inscriptions should be therefore read in sequence: first the right panel, then the left.

1. Delbrueck 29 (Delbrueck 1929: 144–146) = Volbach 28 (Volbach 1976: 39–40 and pl. 14)
Paris, Bibliothèque nationale, formerly in Compiègne [***Fig. 1***]

Height: 38 cm; width: 14.3 cm
Greek inscription: *IG* XIV 2418, 1. Latin and Greek inscriptions: *CIL* XIII 10032, 8a

The decoration of the diptych is arranged in three medallions on each panel. The upper medallions depict the consul as a half-length figure holding a sceptre and a *mappa*, a napkin used by the presiding magistrate to signal the start of a chariot race at a hippodrome by tossing it down into the arena (for *mappa* and its meaning in the context of diptychs, see Cameron 2013: 196–204). The bust of Emperor Justinus appears atop the sceptre. The lower medallions contain the bust of a female figure, sometimes identified as Constantinopolis, at other times as Roma (Cameron 2015: 270 n. 105), dressed in the triumphal trabea and holding the fasces in her hands. The central medallions are occupied by a Latin inscription presenting the *cursus honorum* of Philoxenus.

On right panel (diptych's front cover)

Fl(avius) Theodo(rus)
Filoxenus
Sotericus
4 Filoxenus
vir illust(ris)

continuing on left panel (back cover)

com(es) domest(icorum)



Fig. 1. Consular diptych of Philoxenus. Paris, Bibliothèque nationale, formerly in Compiègne (Delbrueck 29 = Volbach 28).
© Bibliothèque nationale de France

ex magistro m(ilitum)
per Thracia(m)
et consul
ordinar(ius)

Between the medallions, arranged in short lines (four on each panel), is a Greek inscription containing two iambic verses:

On right panel (diptych's front cover)

τουτὶ τὸ δῶρον τῇ σοφῇ γερουσίᾳ

continuing on left panel (back cover)

ὕπατος ὑπάρχων προσφέρω Φιλόξενος.

This gift to the prudent senate,
I, Philoxenus, being consul, offer.

2. Delbrueck 30 (Delbrueck 1929: 146–147) = Volbach 30 (Volbach 1976: 40 and pl. 15)
Dumbarton Oaks Collection, formerly Milan, Collection Trivulzio [***Fig. 2***]

Height: 33.5 cm; width: 13 cm
Greek inscription: *IG* XIV 2418, 2. Latin and Greek inscriptions: *CIL* V 8120

The diptych lacks figurative decoration as well as any depiction of the consul.

At the centre of each panel is an octagonal medallion bearing a Latin inscription, enclosed within a rhombus that intersects both the medallion and the four sides of the frame.

In the corners, circular fields contain a Greek inscription.

On right panel (diptych's front cover)

Fl(avius) Theodo(rus)
Filoxenus
Sotericus
Filoxenus
vir ill(ustris)

continuing on left panel (back cover)

com(es) dom(esticorum)
ex magistr(o) <m(ilitum)>
per Thracia(m)
et consul
ordin(arius)



Fig. 2. Consular diptych of Philoxenus. Dumbarton Oaks Collection, formerly Milan, Collection Trivulzio (Delbrueck 30 = Volbach 30).
© Dumbarton Oaks, Byzantine Collection, Washington, DC

The Latin inscription presents the identical *cursus honorum* of Philoxenus as that on the diptych from Paris (no. 1, above), with minor textual variations (such as abbreviated words and the omission of "m(ilitum)" in line 7) resulting solely from the reduced space available in the central medallions.

Greek inscription:

On right panel (diptych's front cover)

τῷ σεμνύνοντι τοῖς τρόποις τὴν ἀξίαν

continuing on left panel (back cover)

ὕπατος ὑπάρχων προσφέρω Φι[λό]ξεν[ος].

To a man who matches greatness of character to greatness of rank
I, Philoxenus, being consul, offer.

The Dumbarton Oaks diptych bears two iambic verses, the second of which is identical to that found on the Paris diptych. The first line, however, differs and its meaning is not immediately clear. The translation given above follows, in essence, that proposed by Alan Cameron (Cameron 2012: 521), although he adopted the reverse order of the verses. Regarding the first line of my edition (his second), Cameron comments: "K. Weitzmann translated the second line, 'to one who takes pride in his way of life' [Weitzmann 1972: 29], but in the context ἀξία must refer to the rank of the addressee; so A. Cutler, 'for someone who is important in rank and character' [Cutler 1984: 105]. But σεμνύνω surely carries its normal active meaning, 'make noble'. I would suggest 'for a man who matches greatness of character to greatness of rank'. But whatever the exact meaning, the characterization is studiously vague".

3. Delbrueck 31 (Delbrueck 1929: 147–148) = Volbach 29 (Volbach 1976: 40 and pl. 14–15)
Paris, Bibliothèque nationale, originally from Autun [***Figs 3–4***]

Height: 35 cm; width: 13 cm

The diptych contains neither a depiction of the consul nor any figural decoration.

Each panel features a rhombus that terminates at the top and bottom in a tripartite leaf. The wreaths encircling the base of these leaves differ slightly in form from those on the panels of diptych no. 2 above; however, the leaves in the inner acute angles of the rhombus and the central octagons are identical in design.

Scholars commenting on this object in recent decades generally agree that no traces of an inscription are visible. However, according to Delbrueck, the diptych was shallowly incised with the consul's name ("vorgeritzt und mit Farbe geschrieben"); today, the object displays no remaining evidence of any letters (Netzer 1983: 266 n. 2: "Although this ivory closely resembles another now in Washington [diptych 2, above] inscribed with Philoxenus's name, this similarity supplies insufficient evidence to place the Paris ivory within the core group of inscribed diptychs"; see also



Fig. 3. Consular diptych of Philoxenus.
Paris, Bibliothèque nationale, originally from Autun (Delbrueck 31 = Volbach 29).
© Bibliothèque nationale de France



Fig. 4. Backside of the consular diptych of Philoxenus. Paris, Bibliothèque nationale, originally from Autun (Delbrueck 31 = Volbach 29). *Kyrie* and *Gloria* inscribed in ink in the 9th century, indicating the object's secondary liturgical use.
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Cameron 1984: 401, who on this occasion criticized Delbrueck: "these traces are not visible today, and Delbrueck is not a reliable witness in such matters").

And yet, perhaps Netzer and Cameron were too hasty in dismissing this artifact, contrary to the views of 19th-century scholarship. Inspired by a remark made by Wilhelm Meyer (Meyer [of Speyer] 1879: 79), Hans Graeven—with the help of a French colleague—examined the diptych attributed to Philoxenus: "Dass innerhalb dieser eine Inschrift ausgekratzt ist, war bei der Untersucheng des Originals auf den ersten Blick zu sehen. Herr Adrien Blanchet half mir freundlichst, die lesbaren Spuren festzustellen" (Graeven 1892: 209). Interpreted in this way, the remnants of the inscription gave Graeven confidence that this was another diptych of Philoxenus. The text he established was included in *CIL* XIII 10032, 8b, where it was reprinted preserving the original layout, though without restoring the missing letters. The reconstructed inscription reads as follows.

On right panel (diptych's front cover)

Fl(avius) [The]o[dorus]
[F]i[loxenu]s
S[ote]ri[c]u[s]
F[il]oxen[u]s
v[i]r [il]l[ust(ris)]

continuing on left panel (back cover)

c[om(es) do]m[est(icorum)]
[ex magi]s[t]r[o m(ilitum)]
p[er Thraci]a(m)
et [consu]l
[ord]in[ar(ius)]

We are thus dealing with a *cursus honorum* identical to that found on the first two diptychs. Interestingly, neither Meyer nor Graeven mentions any traces of a Greek inscription; Delbrueck, however, states: "Ob auch die griechische Dedikationsinschrift da war, ist zweifelhaft" (Delbrueck 1929: 147).

The number of diptychs attributed to Philoxenus is sometimes given as four (for example, in Martindale 1980 [*PLRE* II]: 879–880), which is a misunderstanding resulting from the inclusion of an artifact that is, in fact, a modern forgery. This object, along with two other similarly forged diptychs, belonged to the collection of Gabriel Féjerváry, which was acquired by the museum in Liverpool in the 19th century. The diptych attributed to Philoxenus is a copy of the piece now housed at Dumbarton Oaks (Delbrueck 1929: 278; see also Graeven 1892).

*

The name of Philoxenus, consul of the East in 525, frequently appears in the dating formulae of papyrus documents from Egypt. Several documents begin with the formula ὑπατείας Φλαουίου Φιλοξένου τοῦ λαμπροτάτου (*illustris*), while the rarer form ὑπατείας Φλαουίου Φιλοξένου τοῦ ἐνδοξοτάτου (*gloriosissimus*) also occurs (for a list of documents, see Bagnall and Worp 2004

[*CSBE*]: 204–205). In 526, documents continued to be dated by the name of Philoxenus (post-consulate), with the formula μετὰ τὴν ὑπατείαν Φλαουίου Φιλοξένου τοῦ ἐνδοξοτάτου, and only in a single instance—*PSI* III 246 (Oxyrhynchus)—does the title λαμπρότατος, dominant the previous year, reappear. Curiously, none of the documents from 526 is dated by the name of that year's actual consul, Flavius Olybrius, who only appears in documents the following year, and then already as an ex-consul (post-consulate). One document dated by the post-consulate of Philoxenus, *P. Rain. Cent.* 114 (from the Arsinoite nome), was in fact written as late as 528/9, if the indiction date (seventh indiction) is to be trusted.

This inconsistency in the sources led Bagnall and Worp to propose a hypothesis about an attempted era reckoned from the consulate of Philoxenus (Bagnall and Worp 2004 [*CSBE*]: 89–90 n. 4), though it was soon abandoned. From the perspective of our investigation into the figure of Philoxenus, such an attempt may indicate that he was a person of substantial prominence and widespread recognition in Egypt.

Building activity in Constantinople

The station for pilgrims on the southern shore of Lake Mareotis was not the only building project undertaken by Philoxenus. There is sufficient evidence to assert that his construction activity was on a grand scale, reflecting both his considerable material resources and his political significance. In Constantinople, the second-largest covered cistern—located between the Forum of Constantine and the Hippodrome, just south of the Mese (the city's main thoroughfare [***Fig. 5***])—is plausibly identified as that of Philoxenus. The subterranean reservoir measures 64 meters in length and 56.4 meters in width, covering an area of approximately 3,600 m² with a capacity of 40,000 m³ of water. The cistern is a hypostyle structure with vaulted ceilings [***Fig. 6***]. Its 224 marble columns—sourced from the nearby island of Marmara—are 12.4 meters high and 0.6–0.65 meters in diameter, arranged in 16 rows of 14 columns each (Forchheimer and Strzygowski 1893: 57 with a plate 6 on p. 56 [***Fig. 7***] containing plan, section and architectural drawings of a column and of a vault; Bardill 1997: 72–73).

This cistern, known today as the Binbirdirek Cistern (Turkish: Binbirdirek Sarnıcı, "Cistern of a Thousand and One Columns"), is referred to in Greek sources as the Κινστέρνα τοῦ Φιλοξένου. This identification was first proposed by Petrus Gyllius (Pierre Gilles, 1490–1555) in his monumental work *De Topographia Constantinopoleos et de illius antiquitatibus libri IV*, published posthumously in 1562. Gyllius associated the "Cistern of a Thousand and One Columns" with that of Philoxenus, relying on urban tradition and the memory of the Greek inhabitants of the city whom he came to know less than a century after the Ottoman conquest.

The construction of the Binbirdirek Cistern can be dated to the 6th century based on its column capitals and masons' marks (Mango 1995: 16). According to Müller-Wiener (1977: 280), the stamps on the bricks used in the cistern's construction date to the second half of the 5th century and the early 6th century. It is thus certainly not a 4th-century structure and was therefore not built by one of the Roman senators who arrived at the Bosporus alongside Constantine, as recounted in the *Patria of Constantinople*: ὁ δὲ Φιλόξενος ἔκτισεν κινστέρναν τὴν ἐπονομαζομήνην Φιλοξένον ("Philoxenos built a cistern, the so-called Philoxenos") (I 67, ed. and trans. Berger

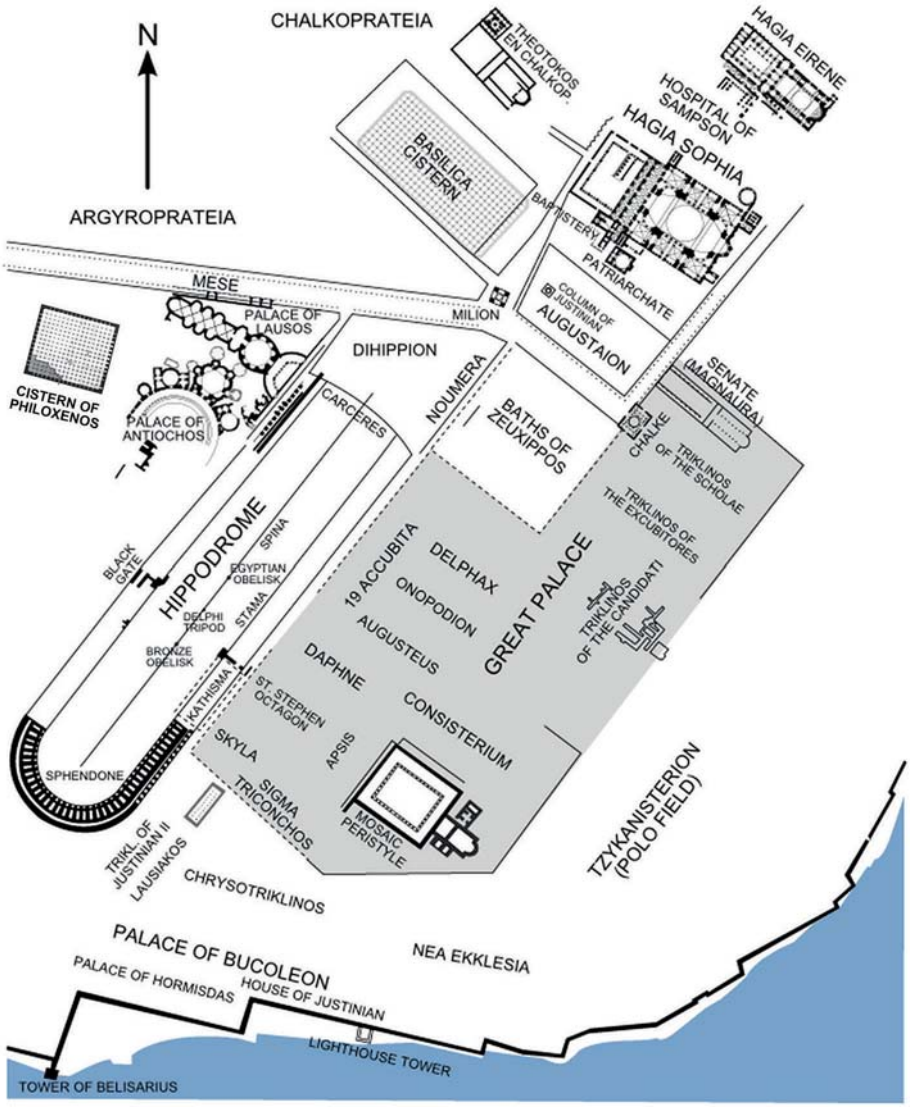


Fig. 5. The imperial district of Byzantine Constantinople, with the Great Palace and the approximate locations of its main buildings (based on literary descriptions), the Hippodrome, the Hagia Sophia and the surrounding structures. Surviving or excavated structures are in black, the conjectural outlines of structures in grey, and the shaded portion corresponds to the area occupied by the Sultanahmet Camii and other later structures. © Wikimedia Commons

2013: 40 and 41, respectively). This tradition recorded in the *Patria* was known to Philipp Forchheimer and Josef Strzygowski, who questioned the identification of the Binbirdirek Cistern with the "Cisterna Philoxeni" according to their terminology (Forchheimer and Strzygowski 1893: 170–172). Their skepticism regarding the Constantinopolitan tradition arose from the discrepancy between the *Patria of Constantinople* and the architectural details observed by Forchheimer and Strzygowski, which they correctly dated to the 6th century.

From the perspective of the present study, the identification of the Binbirdirek Cistern with the building constructed by Philoxenus, although not absolutely certain, is of secondary importance.



Fig. 6. Interior view of the Cistern of Philoxenus.
© Wikimedia Commons

The primary concern is the historicity of Philoxenus himself, the purported companion of Constantine. He appears exclusively in Book I of the *Patria of Constantinople* (also known as *Scriptores originum Constantinopolitanarum*), a collection of several narratives concerning the history of Constantinople, its notable buildings, and the artworks displayed within the city. These narratives were compiled into a single work in the late 10th century during the reign of Basil II Bulgaroktonos.

Book I is largely composed of the earliest description of the founding of Constantinople by Hesychius of Miletus, who wrote in the 6th century under the reign of Justinian. However, chapters 63 and 67, where Philoxenus is mentioned, belong to a portion of Book I that does not derive directly from Hesychius, but rather expands upon the final chapters of his work by incorporating significantly later legends (Berger 2013: xii–xiii).

Of greatest significance is the account of the twelve Roman noblemen or senators whom Constantine compelled to accompany him to the new city and settle there (I 63): "four magistroi, Addas, Protasios, Skombros, and Philoxenos, and eight patricians, Domninos, Probos, Dareios, Mauras, Rhodanos, Salloustios the prefect, Modestos, and Euboulos" (τέσσαρας μὲν μαγίστρους [...] ὀκτὼ δὲ πατρικίους). These individuals are not attested as historical figures from Constantine's time, although several (but not Philoxenus!) reappear approximately forty years later, in the 360s: Sallustius, if identified with Flavius Sallustius, *praefectus praetorio Galliarum* in 361–363, consul 363; Rhodanus, *praeses Orientis* ca. 364; Domitius Modestus, *praefectus praetorio Orientis* 369–377, *consul* 372 (Jones, Martindale, and Morris 1971 [*PLRE* I]). Many of these figures—perhaps

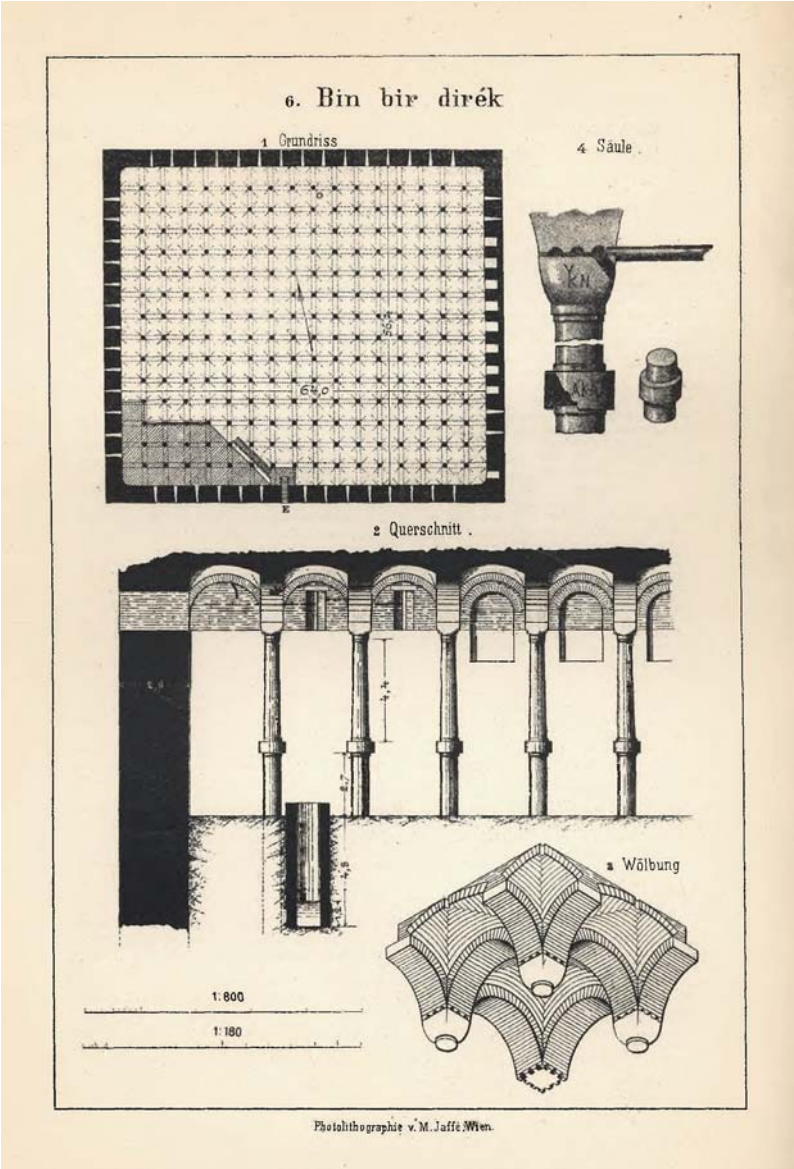


Fig. 7. The Binbirdirek Cistern (Cistern of Philoxenus): plan (1), section (2), architectural drawings of a column (4) and of a vault (3) (Forchheimer and Strzygowski 1893: 56 plate 6)

all—left toponyms in Constantinople, including, of course, Philoxenus, while the buildings they allegedly constructed are listed shortly thereafter by the author of the *Patria of Constantinople* (I 67–70).

The list of twelve high-ranking officials accompanying Constantine should be understood as a literary *topos*, with their names selected in such a way as to provide etymologies for well-known building names.

It can therefore be concluded that the *Patria of Constantinople* does not confirm the existence of Philoxenus in the 4th century, but merely indicates the presence of some Philoxenus in the city's toponymy, as explicitly stated shortly thereafter (I 67): "the sites received their names from

the names <of the Romans>. Philoxenos built a cistern, the so-called Philoxenos". Thus, the text provides no grounds for dating the construction of Philoxenus's cistern to the 4th century.

Arguments against identifying the Binbirdirek Cistern with the Cistern of Philoxenus have been advanced by Jonathan Bardill, who pointed to another cistern that was apparently open to the air and located to the northwest of Binbirdirek, on the northern side of the Mese; part of its eastern wall can still be seen on the west side of Babıali Caddesi (Bardill 1997: 69–75). Since this structure, on the basis of its construction technique (the bond of the walls, the type and dimensions of the bricks, etc.), is dated to the 5th century, Bardill attributes it to another Philoxenus—a figure otherwise entirely unknown, except for the fact that Isidore of Pelusium, who died ca. 450, addressed one of his letters to him (*Ep.* II 286 [in *PG* LXXVIII]: Φιλοξένῳ μαγίστρῳ; cf. Martindale 1980 [*PLRE* II]: 878, Philoxenus 2). This, in Bardill's view, accords with the account in the *Patria of Constantinople*, where Philoxenus is listed among the *magistroi* of Constantine (although, of course, Bardill is aware that this last circumstance would point to the 4th rather than the 5th century). In his topographical study, Bardill is generally inclined to question identifications accepted in scholarship between particular buildings and their extant remains. Even if he is correct in the case of the Palace of Lausus, the arguments he advances for rejecting the identification of the Binbirdirek Cistern with the Cistern of Philoxenus—regardless of who that Philoxenus was—an identification accepted by many scholars (following Pierre Gilles, see above), appear unconvincing.

If, therefore, we maintain the identification of the Binbirdirek Cistern with the Cistern of Philoxenus, based on the urban tradition of Constantinople, the only viable candidate for the role of the cistern's founder remains Flavius Theodorus Soterichus Philoxenus, consul in 525 and founder of the Philoxenite—a hypothesis present in scholarship and reiterated by various scholars (Janin 1964: 207–208; Müller-Wiener 1977: 280, pl. 263; Berger 1988: 617; Mango 1995: 16). Acceptance of the non-historicity of a Philoxenus in the time of Constantine removes the sole objection that Forchheimer and Strzygowski raised against identifying the Binbirdirek Cistern with the Cisterna Philoxeni.

The cistern was not the only site in the imperial capital associated with Philoxenus's activity and the expenditure of his personal resources for public purposes. George of Pisidia, a renowned 7th-century poet, in his *Bellum Avaricum*, which recounts the unsuccessful Avar siege of Constantinople in 626, mentions that approximately 80,000 barbarians approached the gate of Philoxenus (lines 217–219):

> καὶ πρὸς τὰ τείχη τῆς Φιλοξένου πύλης
> πλήθη προσῆλθεν, ὥσπερ ἦν εἰκασμένα
> ὀκτὼ συναθροίζοντα μυριαρχίας.
>
> e si avvicinarono in massa alle mura della porta di Filosseno, in tal numero
> da uguagliare nel loro insieme otto miriarchie 220 [= 80 000 uomini]
> (tr. Pertusi 1959).

The location of this Φιλοξένου πύλη is unknown (for topographical details, see Pertusi 1959: 215–216), but the context clearly indicates that it must have been a significant element of the capital's defensive system (for details of the attack, see Whitby and Whitby 1988: 173 n. 463).

The Egyptian context

Nothing certain is known about the origin of Philoxenus. As previously noted, he was recalled from exile by Justin alongside Apion, a member of a prominent family originating from Oxyrhynchus (called Apion II in modern literature); however, this does not justify conjectures about the existence of an Egyptian faction in Constantinople. The sources provide no evidence whatsoever linking Philoxenus personally with Egypt. Nonetheless, his interest in the sanctuary of St Menas may have stemmed from some connection to Egypt or perhaps Alexandria.

The *Encomium of St Menas*, which offers surprisingly detailed descriptions of the city constructed for pilgrims, refers to Philoxenus as "praetorian prefect" (cf. the text cited in Wipszycka's previous chapter, p. 9). For the author of the *Encomium*, who likely wrote in the second half of the 8th century, this term would have been entirely unfamiliar. It is easy to imagine an error involving misinterpretation of the title: the reference may not have been to the praetorian prefect but rather to the prefect of Egypt (*praefectus Augustalis*). This, of course, remains mere speculation unsupported by other sources, but it fits well with the realities of the period.

The prefect of Egypt, as a member of the Alexandria's elite, could naturally have commissioned the construction of a city and station for pilgrims travelling to the sanctuary of St Menas. Moreover, members of the Alexandrian elite evidently possessed sufficient funds to finance such enterprises from their own resources, as demonstrated by a remarkable document precisely from the same era (the reign of Anastasius), concerning—as we shall see—the same region.

P. Oxy. LXIII 4394 was "discovered" in Oxford among the Oxyrhynchus papyri (see Rea's introduction), yet there is no indication that it originated from that city. On the contrary, its preamble explicitly states that it was drawn up in Alexandria.

All the individuals mentioned in the document, as well as all other circumstances, point to Alexandria and its immediate surroundings. The essence of the document was aptly summarized by its editor, John R. Rea:

> The date of the main body of the contract is given as 13 July 494, but after that there is a long preamble giving the history of the transaction to that date. Flavius Julianus, *clarissimus tribunus*, *notarius sacri palatii*, a resident of Alexandria, whose copy of the contract this was, sharing the liability jointly and severally with another Alexandrian resident, Flavius Olympiodorus, *scholasticus* and advocate in the court of the Augustal prefect of Egypt, borrowed money from Flavius Maximinus, who was another *scholasticus* and advocate in the same court, on 22 August 492. The original sum was the very large one of one thousand, four hundred and fifty-five solidi, which represents more than twenty Roman pounds of gold [over 6.5 kg – TD]. The interest rate was ½% per month, 6% per annum, and after twenty-two full months without any payments of interest the amount of the loan had grown to one thousand, six hundred and fifteen solidi. On the date of the present contract Julianus surrendered to Maximinus in part repayment two orchards valued at six hundred and seventy-five solidi, leaving still outstanding nine hundred and forty solidi. The original contract of 492 was cancelled and returned to Maximinus as evidence of the length of the loan and the present document was drawn up acknowledging that Julianus and Olympiodorus still had on loan nine hundred and forty solidi at the same rate of interest, reckoned from the first day of the Egyptian month eighteen days earlier than the date

of the contract, until they should make full repayment of capital and interest. They acknowledged the right of Maximinus to demand repayment whenever he chose, accepted a mortgage of all the property of both of them now and in the future, and finally swore an oath by Almighty God and the piety and victory of the emperor Anastasius that they would accept the contract as binding.

The last lines (250–256) of this long document contain the final acknowledgement by the lender that the loan had been repaid, dated to 15 February 500 by the name of the consul of 499. The parties involved in the transaction thus possessed substantial capital and owned properties of sufficient value to be used toward the repayment of this large loan. Flavius Julianus transfers to Flavius Maximinus two orchards valued at 675 solidi (lines 64–69):

κηπία δύο καὶ τὰ συγκυροῦντα αὐτοῖς πάντα σὺμ (l. σὺν) παντὶ αὐτῶν τῷ δικαίῳ κείμενα ἐν τῇ Ταφοσιριακῇ ταινίᾳ πρὸς τῇ καλουμένῃ Γλυκαίᾳ ἤτοι Ὑδρηγοῖς πλησίον τῆς Μαρίας (l. Μαρείας) λίμνης.

two orchards and their appurtenances with every right in them, situated in the Taphosiris Strip by the so-called Glycae or Conduits near Lake Marea (tr. J.R. Rea).

These two valuable estates of Julianus are located near Lake Marea (i.e., Mareotis), on the spit separating it from the sea, close to Taposiris, approximately 10 kilometres from Philoxenite.

Conclusion

Philoxenite, situated on the southern shore of Lake Mareotis, was founded by Flavius Theodorus Philoxenus Soterichus, a member of the highest echelons of the Roman imperial administrative elite, who undoubtedly possessed substantial financial resources. We know of his construction activity in the imperial capital and have some knowledge of the political career that led him to the consulship in 525. However, nothing is known about his origins or the sources of his wealth. Nevertheless, it may be argued that Philoxenus's activities in the immediate vicinity of the sanctuary of St Menas, and the works carried out for its benefit, reflect the awareness of the state elite. In a certain sense, they may have constituted the implementation of a policy that the author of the *Encomium of St Menas* expressed in a simplified and naïve manner by invoking Zeno's appeal to the senators to build their palaces in Abu Mena ("the king ordered all those of senatorial rank in the kingdom to build each of them a palace there").

Philoxenus did not construct a palace for himself; rather, moved by concern for pilgrims, he established for them a place of rest and respite on the southern shore of Lake Mareotis. This was a deed befitting a great lord, commemorated by the name given to the site, derived from his own.

The location of Philoxenus's activities was not chosen at random. In the 5th and 6th centuries, Mareotis—including the vicinity of Abu Mena—was a region of considerable importance, by no means desert (as Wipszycka [2025: 27–29] emphatically stresses), and the site of estates of great value, such as the orchards in the Taposiris Strip, which Flavius Iulianus transferred to Flavius

Maximus as partial repayment of an enormous loan. In this part of Egypt, there must have been estates comparable in wealth to the fortunes of the Apiones. The absence of papyrological documentation from this area—preserved only in exceptional cases—precludes much knowledge of these estates and their owners.

Flavius Iulianus and Flavius Maximus were certainly not the only, nor, in all likelihood, the wealthiest landowners in the area. Whether Philoxenus was among them cannot be ruled out, although nothing is known on this point. Members of the Alexandrian elite—great families originating from Egypt, whose sons, like the Apiones, attained the highest honours in the Empire—possessed the requisite means to support the cult of St Menas and to enhance its splendour through their financial contributions. In Philoxenus's activities, one may also discern an echo of ancient euergetism, which enjoined the wealthy to concern themselves with the needs of others. Such undertakings were, of course, also intended to preserve the memory of the benefactors themselves, as in the case of our Philoxenus.

If Philoxenus indeed belonged to the administrative elite of Egypt, or even stood at its apex as *praefectus Augustalis*—an assertion for which, it must be emphasized once again, there is no direct evidence—he would also have been among the addressees of another part of Zeno's appeal: "He also wrote to the archontes of Alexandria and those of Egypt, that each of them, throughout the land, should build himself a house there until they made a city". This is, of course, a literary *topos* characteristic of hagiography; nevertheless, it is also possible that behind this "literary fact" (see Wipszycka 2012: 423)—which otherwise recalls the story of Constantine and the twelve senators founding the new imperial capital—there lay a concrete historical reality.

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Chapter Three

LITERARY SOURCES ON PHILOXENITE: A SURVEY*

Przemysław Piwowarczyk

The literary sources on the town of Philoxenite are few. The most important texts are included in a parchment codex from the Monastery of Archangel Michael at Phantoou (modern-day Hamuli), in the Fayum oasis housed at the Morgan Library and Museum in New York under a shelfmark M. 590. The colophon states that it was executed in 609 according to the Era of the Martyrs, which means AD 892/3 (Depuydt 1993: 250–253; CLM ID 221[1]). The codex contains three texts dedicated to St Menas which were copied together in a monographic volume to be read at a liturgical commemoration of the saint. They differ in genre and reflect different traditions concerning the saint (Gascou 2007: 244; cf. Ehrhard 1952: 894–895)[2]. The texts are as follows:

1. the anonymous *Martyrium of St Menas*;
2. the *Miracula of St Menas* by Theophilus of Alexandria;
3. the *Encomium of St Menas* by John of Alexandria.

Two of the three texts, namely the *Miracula* and the *Encomium*, mention Philoxenite and are characterised in detail below.

Miracula of St Menas

The *miracula* of St Menas have been preserved in several collections and in several languages. It is doubtful whether the single original composition ever existed. Instead, the *miracula* represent fluid "living literature", freely reshaped in the transmission process. For the present topic, only the Coptic, Greek and—to some extent—Arabic collections are of significance, as all other language versions are based on these.[3]

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[1] The CLM (Coptic Literary Manuscript) numbers refer to the system adopted in *An archaeological atlas of Coptic literature* (https://atlas.paths-erc.eu/ [accessed 10 Sep. 2022]), prepared by the team led by Paola Buzi as an effect of the project Tracking Papyrus and Parchment Paths (PAThs).

[2] Ehrhard's typology refers to Greek Byzantine manuscripts, but is valid also for the Coptic literature. His idea that the monographic volumes (*Spezialsammlungen*) were produced for a church or monastery specifically associated with the saint cannot be proven in the case of the Hamuli Ms.

[3] The Ethiopic *miracula* remain largely unedited (Rafał Zarzeczny is currently working on the edition of the entire collection. An English translation, accompanied by detailed commentary, is already available [Zarzeczny 2025]). However, since they are translations from Arabic, they have become less relevant for historical analysis following the publication of the Arabic tradition by Jaritz. As far as we know, the Armenian and Slavic collections contain no independent material.

Philoxenite is mentioned in the *Miracula of St Menas* several times. These short stories are the earliest compositions in which the name Philoxenite appears. The town pops up occasionally in passing as a background to some minor episodes. Some *miracula* do not feature the name but mention the lake, port or travel facilities.[4] It is thus highly plausible that we are dealing here with the use of an existing toponym and not literary fiction.

The oldest known Ms. is M. 590 from the Morgan Library and Museum in New York, already mentioned, which contains a prologue and 17 *miracula*. Since the Ms. is badly damaged in the middle part, only some of the *miracula* have been published, first by James Drescher (1946) and later by Paul Devos (1959–1960, 1960). However, when comparing the Greek and Arabic versions, it is likely that we have edited all the *miracula* that mention Philoxenite.[5] There are two more published Coptic Mss., an important and extensive one in the IFAO collection (IFAO copte 315–322; CLM ID 1770) edited by Seÿna Bacot (Bacot 2011),[6] and small fragments of little historical value in the British Library edited by Crum (*P. Lond. Copt.* I 340; CLM ID1324),[7] preserving parts of the Coptic collections. In addition to these, there are two further unedited fragments: one from the White Monastery (CLM ID 6255; Piwowarczyk, forthcoming)[8] and another from Qasr Ibrim (CLM ID 6412).[9] The sequence of the *miracula* in the Mss. from the Morgan Library and Museum and IFAO differs. In the academic literature (if not stated otherwise), numeration usually follows Drescher's edition.

The Greek collection is preserved in numerous Mss., with the earliest coming from the 10th century. The number of *miracula* differs, but there are never more than 13. No critical edition of the Greek collection has been published to date. Recently, Paolo Varalda and Luigi Silvano made significant progress editing single *miracula* based on numerous Mss. (Silvano and Varalda 2019; Varalda 2021). However, the only edition of the entire collection remains that by Ivan Pomâlovskìj (1900), who edited a single 11th-century Ms. from the State Historical Museum in Moscow. The sequence of the *miracula* represented by this Ms. became a standard when used in *Bibliotheca Hagiographica Orientalis*. Silvano and Varalda conveniently follow BHO numerations, though the number and sequence of *miracula* vary between Mss.

In Arabic, more *miracula* have been preserved, up to 23 in one Ms. The number and sequence of the *miracula* differ across Mss. Felicitas Jaritz (1993) edited the main witnesses and gave a synopsis of the rest.[10] Some Arabic Mss. are translations from Coptic, while others are from Greek. There is no uniform sequence. Some of the extra *miracula*, unattested in Coptic, might be variations of pre-existing narratives (e.g. "The Possessed Jew").

[4] The *miracula* also provide unique glimpses into the pilgrims' trail between Philoxenite and Abu Mena (for more on the martyrion of St Thecla, see Wipszycka 2024). Surprisingly, there is no mention of the monumental basilica in Philoxenite nor of any other church there. This fact might be explained by the rationale behind the collection. The clergy of Abu Mena, responsible for its creation, were interested in focusing pilgrims' attention (and offerings) on the Martyr's shrine. So, they drew a veil on competing sites.

[5] As far as we can assess the content of the lost Coptic *miracula* by a comparison with the Greek and Arabic text.

[6] In the case of the British Library fragment (*P. Lond. Copt.* I 340), it is a reproduction based on Crum's edition in *P. Lond. Copt*. The *miraculum* "The Jew and the Christian" from the IFAO manuscript was edited by Devos (1960).

[7] The text was republished by Bacot (2011: 51, 55, and 57).

[8] It contains *miraculum* 11, following the sequence in M.590.

[9] In 2022, Joost Hagen, who was entrusted with the manuscript, presented a preliminary report on this fragment in Katowice. The fragment includes at least the prologue to the *miracula* and *miraculum* 1.

[10] Additionally, two new Arabic manuscripts were identified by Hany N. Takla (2017).

Although the original language of the composition has long been debated, with a Coptic origin often preferred, the available evidence more convincingly supports a Greek original (Piwowarczyk 2025: 40–48). However, the Greek text we currently possess represents a late stage of transmission in which some local Egyptian details have been lost.[11] Concerning Coptic witnesses, IFAO and the Morgan Library and Museum Mss. share numerous similarities but also exhibit significant differences. They cannot be linked to one another in a stemma as they probably represent two lines of tradition. It seems that the IFAO Ms., though produced later, retains more details that might derive from the original composition. E.g., in the description of mooring in the *miraculum* "Eutropius and the Silver Plates", the word ⲙⲟⲛⲟⲃⲟⲗⲟⲥ appears (p. 24, col. b, Bacot 2011: 56) which seems to be a local Egyptian name of an anchor used for river boats (see Zilliacus 1954). In the *miraculum* "The Jew and the Christian", a very accurate phrase describes the portico exonarthex of the sanctuary: ⲧⲉⲥⲧⲟⲁ ⲙⲡⲧⲟⲡⲟⲥ ⲉⲧϩⲓⲃⲟⲗ ("external portico of the shrine"; Devos 1960: 288; in the Greek, there is νάρθηξ in this place). In historical research on the *miracula*, both the Coptic and Greek Mss. have to be consulted. Even if the IFAO Ms. preserves more historically valuable details, the M.590 is earlier and more complete.

The Coptic (and Coptic-dependent) tradition credits archbishop Theophilus (384–412) with authorship of the collection of *miracula*. The Greek (and Greek-dependent) tradition features Timothy (380–384) instead.[12] Since the plotline of at least some *miracula* takes place in the 6th century (see below), the authorship of these patriarchs is untenable, and the work remains anonymous. Taking into account the very local horizon of the *miracula*, and the focus on offerings and other revenues of the Abu Mena shrine, which is omnipresent in them, the collection was most probably produced by the clergy of the sanctuary.

The time of composition can only be approximated.[13] In several stories (both in Coptic and in Greek), St Menas is said to appear in the guise of a *spatharius*, a military and court title which is not attested before the middle of the 5th century, and in the papyri appears from the 6th century onwards.[14] Since the name Philoxenite appears in a few of the *miracula*, they could not have been composed before the first decades of the 6th century.[15] Since in two *miracula* the sanctuary is portrayed as being recently under reconstruction,[16] Justinian's reign fits best into the period limited by the previous criteria. Ángel Narro identifies in the Greek text of "The Female Pilgrim

[11] Recently, a 12th-century Greek Ms. was published with a rewritten text of the *miracula*. It is almost entirely devoid of the Egyptian flavour and has no value for historical reconstruction of late antique realities (Bourbouhakis and Duffy 2003).

[12] There were three Alexandrian bishops with this name in the relevant period, but most probably Timothy I (380–384) is meant.

[13] Efthymiadis proposes the 5th century for the Greek collection (Efthymiadis 1999: 196). Narro, mainly on philological analysis of the Greek text, proposes a date between the 5th and 7th centuries (Narro 2018: 103). For a comprehensive discussion and reconstruction of the collection's complex chronology, see now Piwowarczyk 2025: 48–57.

[14] *Spatharioi* belong to the corps of the imperial *koubikoularioi* and were eunuchs (Kazhdan 1991: 1935–1936).

[15] Of course, pinpointing the exact moment in which the name "Philoxenite" appeared remains debatable. Philoxenus, after whom the town reportedly took its name, was consul in 525 (about him, see Chapter 2 in this volume). The archaeological evidence suggests the town's foundation around the middle of the 6th century, but archaeology provides no clue concerning the town's name at that moment.

[16] The *miracula* "Eutropius and the Silver Plates" and "The Female Pilgrim (Sophia)". This detail appears only in IFAO Ms.

(Sophia)" a quotation from John Climacus' *Scala Paradisi*.[17] The author was active in the first half of the 7th century, so the *miraculum* in its current version could not be earlier than the middle of that century. However, this argument is not conclusive for dating the original Greek collection to a later period, as the Greek manuscripts are late, and interpolation is highly possible. The Coptic version lacks this passage, indicating that it was inserted into the Greek text after the two traditions had diverged.

Concerning a *terminus ante quem*, the Arabic conquest is never mentioned, so we may assume (although it is an argument *ex silentio*) that the collection was composed before the fourth decade of the 7th century. The *miraculum* of "The Paralytic and the Mute Woman" is likely an addition from an external source, as it mentions incubation—a practice not attested by other sources in Abu Mena.[18] The story appears in two other collections of *miracula* from Late Antiquity.[19] A very similar story is found in the anonymous collection of the *miracula* of Cosmas and Damian.[20] Additionally, Sophronius refers to it in the *Miracula of Sts Cyrus and John*, composed in the second decade of the 7th century (*miraculum* 30).[21] Sophronius knew that the story he encountered at the Menuthis shrine was already associated with Cosmas and Damian. Although he does not mention St Menas in this context, it is plausible that he was aware of the local traditions of St Menas. This suggests that "The Paralytic and the Mute Woman" was added to the collection of St Menas' *miracula* after the second decade of the 7th century. Both Greek and Coptic traditions contain this story, implying that they diverged later.

In summary, I would argue that the core collection of St Menas' *miracula* was created in the late 6th century, while the collection of 13 *miracula* postdates the second decade of the 7th century. The Coptic expansions may be of even later date, possibly postdating the mid-7th century (Piwowarczyk 2025: 54–56).

Discovering the rationale behind the composition is a challenging task. Little is said about healing, for example. The miraculous interventions are mainly directed against "wrongdoers" who inflict harm on the pilgrims and property of the shrine. Given that all three *miracula* with female protagonists deal with harassment on the pilgrim's trail, such stories can hardly be interpreted as encouragement to visit the shrine. In the *miracula*, the saint prevents a rape, but in reality, not every hostile assault might have had a happy end. I suppose such stories were intended to have a limited

[17] The exact text of John Climacus goes ἀλλοτρίᾳ μερίδι μὴ προσεγγίσητε (*Scala Paradisi*, *PG* 88, col. 640). The parallel in the St Menas' *miraculum* is not exact: καὶ μνήσθητι τοῦ εἰρηκότος· ἀλλοτρίας μερίδος μὴ προσεγγίσῃς; see Narro 2018: 103. Silvano and Varalda (2019: 61) see the only analogy to this phrase in late-Byzantine author Nicetas Myrsiniotes (14th–15th c.).

[18] To be precise, there is an episode in the *miraculum* of the "Samaritan Woman" that closely resembles a proper incubation. The sinner, punished by St Menas with paralysis of the hands, spends seven days in the sanctuary and receives healing instructions through a dream. In this *miraculum*, we are primarily dealing with a repentant sinner, not someone voluntarily seeking healing.

[19] Another attestation appears in the Coptic *miraculum* of St Mercurius; however, since the sole manuscript dates to the 10th or 11th century, it is impossible to determine its original date of composition, see *Miraculum S. Mercurii ex codice Vindobonensi K 09456*, ed. W.C. Till: 40–41.

[20] The *miraculum* is recorded as number 24 in the *Miracula of Sts Cosmas and Damian*, dated to the late 6th century (Efthymiadis 1999: 198). Although both *miracula* share a very similar plot, the wording differs significantly. There appears to be no direct interdependence between the texts of the two stories included in the collections of St Menas' *miracula* and those of Sts Cosmas and Damian.

[21] However, the *miraculum* Sophronius recounts differs considerably from the one attributed to Sts Cosmas and Damian. It is possible that the reference was originally linked to miracle 52 (Gascou 2006: 106 n. 609). Julia Doroszewska is currently working on this complex tradition of interconnected *miracula*.

circulation and were addressed mainly to locals who could potentially endanger the prosperity of the shrine by abusing pilgrims, stealing the shrine's property, limiting donations and so on. Another purpose was to encourage pilgrims to make generous offerings. Both aims ultimately focused on the economic, and not spiritual, benefits the pilgrims could obtain. This does not mean that there are no *miracula* with an ethical agenda, but they represent a minority of them.[22]

John (IV?) of Alexandria, Encomium of St Menas

The *Encomium* on St Menas ascribed to Apa John, archbishop of Rakote (i.e., Alexandria), brings crucial evidence of Philoxenite. The text was composed in Coptic. Only one Ms. is known, the Morgan Library and Museum M. 590 mentioned above. The key passage goes as follows:

> And again in the time of Anastasius, the king, pious zeal inspired the heart of the Praetorian Prefect since he too heard of the wonders and miracles wrought by the holy Apa Mena. And furthermore he saw the hardships suffered by the many multitudes coming to the shrine. For, when they left the lake and entered upon the desert there, they found no place of lodgment or water till they reached the holy shrine. And the prefect built hospices (ϩⲉⲛⲛⲁ ⲛϭⲟⲉⲓⲗⲉ) by the lake and rest-houses (ϩⲉⲛⲛⲁ ⲛⲉⲙⲧⲟⲛ) for the multitudes to stay at. And he had the market-place (ⲧⲁⲅⲟⲣⲁ) established among them in order that the multitudes might find and buy their needs. He had spacious depositories constructed where the multitudes could leave their clothes and baggage and everything which they brought to the shrine. When he had completed everything he called it Philoxenite after himself. He also set up porticoes at different places where the people might rest. And he established watering-places along the roads, leaving at them water-jars, from the hospices as far as the church, at ten-mile intervals between one watering-place and another, for the refreshment of the people bringing gifts to the church. (Drescher 1946: 70–71 [text], 147–148 [transl.])

The question of authorship of the *Encomium* has not yet been definitively resolved. According to the prologue (50r, col. I, ll. 9–11), the work was composed by John, archbishop of Alexandria. Since the *Encomium* mentions the Arabic conquest of Egypt (68r, col. II, ll. 10–12), we can safely accept AD 639–641 as a *terminus post quem*. The fixed *terminus ante quem* is AD 892/3, the date of the Hamuli manuscript. Between these dates, two archbishops of Alexandria named John occupied the patriarchal throne: John III (AD 677–686) and John IV (AD 775–799). There is very little possibility that we are dealing here with a pseudepigraphic work. Such pieces are frequent in the Coptic literature (also in the hagiographic dossier of St Menas), but as a rule, they are ascribed to holy patriarchs from the 4th and 5th centuries. We do not know of any pseudepigraph which is attributed to either of the previously mentioned Johns.

The *Encomium* was written down and almost certainly also composed at the patriarchal court. The Patriarch himself was most probably also involved. According to the prologue, the text was originally delivered as a sermon. Such a delivery is possible, but our text is certainly not a shorthand

[22] Examples are the *miracula* "The Jew and the Christian" and "The Poor Woman's Sheep", which warn against perjury.

record of a homily, but a well-developed literary composition, most likely prepared after the original speech. The title introduces the archbishop in the third person, but this is characteristic of such peritexts. We may thus safely consider the patriarch as an author, which does not mean that he was personally responsible for each word or sentence. Subsequent parts of the work constituting autonomous units are smoothly connected, and the whole represents a unity in terms of language and style. All of this hints at a single author or one final revision of the whole.

James Drescher cautiously yet inconclusively opted for John IV. His arguments are twofold. Drescher assesses the Greek of the author as poor, and interprets the overall message of the texts as a panegyric on the already past glory of the sanctuary. Both arguments are tenuous. Concerning Greek, Drescher points only to two words (Drescher 1946: 127 n. 3).[23] As for the second argument, my impression is that nothing in the text suggests that the sanctuary was declining at the moment of its composition. The author does not mention any destruction or crisis.

However, there are other, good arguments for John IV. We know that before being elected patriarch, he was associated with the Abu Mena sanctuary. The Synaxary relates that Patriarch Michael I appointed John to supervise the property and the income of the sanctuary, which means he served as a shrine steward (*oeconomus*) (Basset 1915: 605 [571]; Jaritz 1993: 39, no 9). Hitherto, John used to be a monk in the Monastery of Macarius, where he had lived since his youth. This career path may explain certain characteristics of the *Encomium*. The author is well acquainted with local traditions of Abu Mena but, as an outsider, is also critical of some of them, *miracula* including. Ewa Wipszycka argues also for the founding of Helwan during a possible historical model for a literary account of Philoxenite's origin story (see Chapter 1 in this volume, p. 9 n. 9). If so, since Helwan was founded in AD 689, after the patriarchate of John III, only the other patriarch John might have been the author of the *Encomium*.

The main argument against the authorship of John IV is his silence about the renovation of the sanctuary under Michael I (John's patron) and the revival of the settlement as a whole at that time. Such an account would be precisely in line with the scheme of the historical part of the *Encomium*, in which the subsequent milestones in the sanctuary's history are associated with Alexandrian patriarchs. However, it might be that the name of Michael was left unsaid due to Michael's (explicit or implicit) demand to highlight his humility. In any case, the renovation of the shrine was sufficient proof of the patriarch's equality with his famous predecessors listed in the *Encomium*. Composing the praise of the shrine may have been part of a task John was charged with by Michael after appointing him a steward of the shrine. John's patriarchal office might be a later update added to the title in one of the copies of the text after John ascended to the patriarchal throne. Interestingly, the title is lacking in all Arabic witnesses, which might follow a tradition earlier than one represented in Ms. M. 590 from the Morgan Library and Museum.

The main argument in favour of John III is a piece of information given by Abu el-Makarim in his description of the Egyptian monasteries, written in Arabic at the beginning of the 13th century.[24] Abu el-Makarim mentions that before being elected patriarch, John was a monk in the so-called Monastery of the Brothers in the Fayum (*The churches and monasteries of Egypt*, ed. Evetts,

[23] One is a proper name in a form attested elsewhere; the other might be a simple scribal error.

[24] The text was earlier attributed to certain Abu Salih (and as such often appears in the academic literature) who was only an owner of the manuscript, see Zanetti 1995.

p. 209). In that monastery, there was a church dedicated to St Menas. If this tradition, unattested before the 13th century, is true, it would mean that John (III) had no firsthand knowledge of the local traditions of Abu Mena, which makes his authorship of the *Encomium* even less probable.

The *Encomium* polemises strongly with some unspecified people who perceived St Menas from a local perspective.[25] Patriarch John attacks the idea that St Menas was a native of Mareotis and once worked as a camel-herder. Such motifs might well be a product of local Libyan hagiography (now almost entirely lost), but these same ideas are also present in the *Miracula of St Menas*, ascribed to patriarch Theophilus or Timotheus. Thus, the *Encomium* is directed not (or not only) against certain folk beliefs, but against the literary tradition associated with the great patriarchs of the past. The latter, of course, cannot be directly blamed by John. Since the author of the *Encomium* was familiar with the traditions present in the prologue to the *Miracula of St Menas*,[26] we may suspect that the name Philoxenite was also taken from them. However, this was hardly the case. Since John is critical of the local traditions, his elaboration of the Philoxenite account all the more proves that he had other sources confirming the name at his disposal.

The historical perspective found in the *Encomium* is overtly anti-Chalcedonian. The role of the emperor's hostile to Chalcedon, Zeno and Anastasius is stressed; similarly, the anti-Chalcedonian patriarch Timothy Aelurus plays a vital role in the narration, while the fiercely pro-Chalcedonian emperor Justinian is entirely absent. The omission of the latter is the most telling since, thanks to archaeology, we know that the Abu Mena complex underwent general reconstruction and expansion during his reign, perhaps with his consent and financial support.[27]

Such characteristics fit the situation just after the mid-8th century, when the Chalcedonians launched their last diplomatic offensive at the court of the Egyptian governor to get the sanctuary back. The Anti-Chalcedonians gathered a historical dossier supporting their claims to the shrine. While this work is not identical to the *Encomium*, the latter certainly may have been a by-product of research on and an elaboration of earlier traditions.

The *Encomium* is a complex text combining hagiographic genres with a history of the shrine. It consists of an elaborated prologue, the life (with praise of St Menas' city of origin and family—elements well established in classical models) and martyrdom of St Menas, a translation of the Saint's body (*translatio*), the invention of the burial place and relics (*inventio*), and finally the history of the sanctuary. An account of the origins of Philoxenite forms part of the last narrative unit. The foundation of the town constitutes an episode in the main plotline, in which it is a step in the development process of Abu Mena, propelled by a synergy of Alexandrian patriarchs and orthodox emperors.[28]

[25] Besides Abu Mena, St Menas was venerated in other localities in Mareotis. For this cult, see Chapter 1 in this volume.

[26] It is possible that the prologue circulated as an independent piece. While it might have been based on an oral tradition, there is no evidence to support this. Therefore, in the absence of such evidence, it is reasonable to assume that the most likely source for the *Encomium* was a collection of the *miracula*.

[27] The chronology of the sanctuary given in the *Encomium* bears no credibility. Luke Lavan (2020) provides the most recent archaeology-based reassessment of chronology. Lavan's work deals with public space, but he recognises that dating the basilica's rebuilding after 532 (referring to Grossmann 1989: 15; Grossmann actually has "nach 528") is founded on weak premises (Lavan 2020: 811). Generally, Laval accepts that much of the public facilities in Abu Mena came from the late 6th and early 7th century.

[28] Let us note that the founding of Philoxenite does not smoothly fit this scheme since, according to the *Encomium*, it was a private initiative. However, it does lend more historical credibility to this event.

Reworkings of the *Encomium* are also preserved in Arabic. Felicitas Jaritz (1993) distinguishes six versions of the text, though only four contain the shrine's history. They are as follows:

1. Jaritz's version 2 is represented by three Mss. (Jaritz's sigla D, N, and Ī). Ms. N, the only one from this family reproduced by Jaritz (1993: 119) dates to the 14th–15th century. It preserves the name of the new settlement as Iksānīṭa, but the building initiative is ascribed to an unnamed governor (*wālī*) of Alexandria under Anastasius. The Ethiopic text published by Budge is generally in accordance with this tradition, except for the erroneous rendition of many personal names. Also, Ms. F (Jaritz's version 3) in a "historical" section, follows this version.
2. Jaritz's version 3 (Ms. F). The foundation story of the shrine follows version 2.
3. Jaritz's version 4 (Ms. A). This version is attested in the Ms. from the church of St Archangel Michael in Old Cairo (held today in the library of the Coptic Patriarchate). It is undated, but on one of the pages a certain reader wrote down the date *anno martyrum* 1398 (which means AD 1681/2)—so the Ms. itself must predate this note. There are two interesting variants in the story of Philoxenite (the name itself does not appear). It is said that granaries were built in it for the corn given as an offering to the Church. Moreover, the new foundation was named after the king (i.e., emperor Anastasius), and not Philoxenus.[29]
4. Jaritz's version 5 (seven Mss.). In Ms. Ṭ (AD 1726; the only one reproduced by Jaritz with parts dealing with the shrine's history), the overall initiative is credited to the king (emperor) Anastasius, and the account is much shorter than in the previous versions (Jaritz 1993: 125).

The Arabic texts are not simple translations from the Coptic. They underwent a major editing process. They are anonymous and bear titles like "life", "martyrium" and "life and martyrium" (Jaritz 1993: 105). The name of John does not appear in any manuscript. All of those in the section concerning the history of the shrine ultimately hinge on the Coptic text, but with many variations. Arabic translations do not have an independent value, but some of them might help us to better understand obscure passages in Coptic. The Coptic *Encomium* mentions, among other structures in Philoxentie: "spacious depositories (…) where the multitudes could leave their clothes and baggage and everything which they brought to the shrine" (transl. Drescher 1946: 148).[30] The nature of such facilities is mysterious, and the Arabic (Ms. A) understands these buildings as "granaries for offerings to the Church" (Jaritz 1993: 117 [transl.], 371 [text]). Ms. N gives another interesting variant in a Philoxenite account. I provide it in a wider context: "He established a market there and granaries in which were stored the crops which were carried to the church and he called it Iksānīṭa. He built a colonnade [leading] from there to the church. In it, there were vessels full of water" (Jaritz 1993: 119 [transl.], 373 [text]).[31] This detail matches the

[29] Philoxenus' name does not appear in the account. Instead, there is the name Anqāṭūriyūn. It must be a corrupted form of the Coptic ⲡⲣⲉⲇⲱⲣⲓⲟⲛ (Greek πραιτώριον; cf. Jaritz 1993: 117 n. 530). Note that the name of Philoxenite's founder is also not explicitly given in the Coptic text.

[30] The Coptic reads: ⲅⲉⲛⲁⲡⲟⲑⲏⲕⲏ (Gr. ἀποθήκη) ⲉⲩⲟⲩⲟⲱⲥ ⲉⲃⲟⲗ ⲉⲧⲣⲉⲙⲙⲏⲛⲱⲉ ⲕⲱ ⲛⲛⲉⲩⲣⲟⲉⲓⲧⲉ ⲙ̄ⲛ̄ ⲛⲉⲩⲥⲕⲉⲩⲏ (Gr. σκεῦος) ⲛϩⲏⲧⲟⲩ ⲙ̄ⲛ̄ ⲣⲱⲃ ⲛⲓⲙ ⲉⲧⲟⲩⲉⲓⲛⲉ ⲙⲙⲟⲟⲩ ⲉⲡⲓⲁⲣⲧⲩⲣⲓⲟⲛ (ed. Drescher 1946: 71).

[31] The whole passage in Arabic reads: *waḍaʿa fīhi sūqᵃⁿ wa-maḫāzinᵃⁿ tuḫzanu fīhā ăl-ğallātᵘ ăllatī tuḥmalu ilà ăl-bīʿaᵗⁱ wa-sammāhā Iksānīṭā. wa ʿamala usṭuwānātᵗⁿ min hunāka ilá ăl-kanīsaᵗⁱ wa-fīhā awʿiyaᵗⁱⁿ mamluwwaᵗᵘⁿ maʿāʾⁱ*. The orthography is given according to the Arabic text edited by Jaritz. At some points, the text deviates from normative

excavations. A monumental street with porticoes, referred to as ST2 (see Chapter 6 in this volume), constitutes one of the principal axes of the town, leading to the entrance of the great basilica at its northern end. These and other architectural details that diverge from the Coptic text are worthy of scrutiny by archaeologists and art historians, since they might have been emendations resulting from first-hand knowledge of Philoxenite or its ruins.

The material from the *Encomium* is also preserved in the Ethiopic Martyrdom of St Menas (Budge 1909; Chaîne 1910: 33–45). This is most certainly a translation from Arabic. Although it contains a "historical part", the account on Philoxenite is missing in all published Ethiopic Mss.

Nubian miraculum of St Menas

For attestation of the name Philoxenite in the St Menas' hagiographic dossier, the last relevant piece of evidence is the only *miraculum* of St Menas preserved in Old Nubian housed in the British Museum (Ms. Oriental 6805) (Langener 1999; Deptuła 2025). The codex is undated, but thanks to two Coptic codices found together, it can be reasonably dated to the turn of the millennia. The immediate Vorlage is Greek, but Coptic as a language of the original composition cannot be excluded (Browne 1994: 2–4), although I consider it unlikely.

The plotline is unique to this version, although the central motif of a sterile woman seeking the help of St Menas also appears in the *miraculum* "The Female Pilgrim (Sophia)", present in the Coptic and Greek collections. Next, the motif of St Menas' epiphany as a mounted warrior riding a horse belongs to stock elements of narratives about saint warriors.[32] Such observations do not prove a direct link with other known *miracula* since both motifs are unspecific.

Since Philoxenite recurs in the text, the Vorlage surely came out of Nubia. Still, I presume that some local elements were introduced in the transmission process in regions far from Mediterranean Sea, either in Egypt or Nubia (before or after translation into Nubian). The text might have been composed in Nubia from elements taken from pre-existing miracles. Obviously, the composer(s) was unfamiliar with the local situation in Mareotis. The *miraculum* correctly describes a trip from Alexandria to Philoxenite by boat. Still, it then adds that this travel takes many days, and the same vessel may travel to another kingdom—apparently, Philoxenite was thought to be located along the seacoast.

Arabic spelling and when vocalisation is provided in the edition, it occasionally indicates grammar deviating from the standard (that is why a fully vocalised transcription is provided). However, this does not affect the understanding of crucial points. I thank Adam Nieuważny for the transcription, translation, and valuable comments. It is not clear what "there" (*hunāka*) exactly means. It may refer to the last word in the preceding sentence, i.e., Philoxenite (*Iksānīṭa*), but may also refer to the market (*sūq*). Arabic text mentions later the vessels with water placed in the colonnade. The author of the Ms. misunderstood here an account of water-places on the road to Abu Mena present in Coptic. The colonnade is his own invention. Jaritz (1993: 119 n. 544) understands the whole sentence as referring to Abu Mena, but there is no shift in the narration from the previous sentence, which explicitly deals with Philoxenite.

[32] Notably, in the Nubian text, Menas rides a white horse. On military saints, see Walter 2003 (on Menas as a warrior saint: 181–190). Neither in the Greek collection nor in the Ms. M. 590 is Menas' horse characterised as white. However, such a detail appears in the miraculous epiphanies of many military saints, e.g., St Phoebammon, St Claudius, St Mercurius or St Demetrius, see examples given in Ward-Perkins 2022: 493–494, 506; for St Claudius, see Constantin of Siout, *In Claudium* 1 (ed. Godron 1970: 584 [162]). The motif of the white horse refers to armies in heaven riding white horses from Rev 19:14.

Considering all these circumstances, it cannot be excluded that the name Philoxenite was an element found by the composer of the text in his source material, which might have included *miracula* known from Coptic or Greek collections. If so, we need to treat with caution the Nubian *miraculum* of St Menas as an independent attestation of the name Philoxenite.

Life of St Apolinaria[33]

This anonymous piece of hagiography is attested in five Mss. The two earliest (*Vaticanus Graecus* 819 and Ms. 25 from the Limonas monastery on Lesbos) date back to the 11th century. Ángel Narro is working on the critical edition of the text, which has been lacking up to now. Only James Drescher published a single manuscript, *Vaticanus Graecus* 819, in the appendix to his edition of the Coptic *Life of Hilaria* (Drescher 1947: 152–159, Appendix 3).[34] The *Life* recounts a fictive story of Apolinaria, daughter of the emperor Anthimus,[35] who decided to become a monk in Scetis. During her stay in the Holy Land, she chose to visit Abu Mena. After landing in Alexandria, she took a ship, but before reaching Abu Mena, she entered an intermediary location, which Mss. render in various forms. In Ms. Barocci the text goes: τὴν Φιλοξένου οἰκίαν ("house of Philoxenos"), but in *Vaticanus* there is a puzzling τὴν Φιλοξένου; in the late Ms. from Bibliothèque Royale Albert in Brussels (shelfmark 8229) is the lectio τὴν Φιλοξένον. I was unable to consult two other Mss. kept in the Greek monasteries. Undoubtedly, all these *lectiones* render a garbled form of the toponym Philoxenite, and may be emended to τὴν Φιλοξενίτην. So, the *Life of Apolinaria* gives us the unique attestation of this toponym outside the dossier of St Menas.

In Philoxenite, Apolinaria was welcomed by a certain *paramonarius* (παραμονάριος), who supplied her with beasts of burden to go further to Abu Mena. It is difficult to ascertain exactly who this *paramonarius* was, but in the Justinianic legislature the term refers to heads of various charitable institutions led by the Church. He might have been a steward of the "Great Basilica" in Philoxenite since the *Life* portrays him as an official delegated to represent the Church before the prominent member of the imperial family.

The *Life of Apolinaria* shares a lot with the Coptic *Life of Hilaria*, but the relationship between these two pieces is much more entangled than mere translation. Most importantly for the topic, the Coptic text does not mention Philoxenite or any port between Alexandria and Abu Mena. Drescher believes the *Life of Hilaria* to be more elaborated than the *Life of Apolinaria*, but rejects the direct dependence recognising the possibility of an unknown common source (Drescher 1947: 127). Narro (2022: 101–103) opts for the Coptic text as an ultimate source of the Greek composition, close to the *Life of Hilaria* but not identical with it.

[33] The only recent study on the *Life of Apolinaria* is Narro 2022.

[34] Drescher adduces some lections from the 15th-century Ms. Barocci 148, Bodleian Library, Oxford. Antony Alcock prepared an English translation based on Drescher's edition, which is accessible online https://www.academia.edu/4427611/The_Life_of_St_Apolinaria (accessed 01.11.2022).

[35] He might be Anthemius (Anthemius 3 in Martindale 1980 [*PLRE* II]), the emperor of the West in 467–472, but since the action begins in Constantinople, Anthemius (Anthemius 1 in Martindale 1980 [*PLRE* II]), the praetorian prefect of the East in 405–411, was rather meant. He was at the helm of the empire during the early years of Emperor Theodosius II. For identification of Apolinaria's father, see Narro 2022: 86.

Dating this piece of literature is challenging. The *Life of Apolinaria* might then have been composed at any moment between the 5th and 11th centuries. However, the idea of a route from Constantinople via Ascalon, Alexandria and Philoxenite to Abu Mena renders the period before the Persian invasion of Egypt at best. The very name Philoxenite is hardly to be expected in Byzantine literature created after the Arab conquest. The main plotline shows no indication of being inspired by the *Miracula of St Menas*. While it is possible that the description of the route between Alexandria and Abu Mena was ultimately influenced by the *Miracula*, there is no direct evidence to support this. I am more inclined to consider the *Life of St Apollinaria* as an independent witness to the toponym Philoxenite.

Appendix I
Miracula of Sts Cyrus and John[36]

The collections of *miracula* of Sts Cyrus and John do not mention Philoxenite at all. Still, they are helpful for understanding how pilgrimage in the environs of Alexandria functioned in Late Antiquity. The Shrine of Sts Cyrus and John was located in Menouthis (modern Abū Qīr), east of Alexandria. The site of the sanctuary is currently underwater and has not been excavated. However, we have a rich literary dossier which is helpful in research on Abu Mena and Philoxenite (see Chapter 1 in this volume). The dossier consists of:

1. *The Miracula of Sts Cyrus and John* (*Miracula Cyri et Johannis*; BHG 477–479), composed by Sophronius of Jerusalem. The collection is unique as we know the author and can confidently date this composition. Sophronius, a monk and later a patriarch of Jerusalem (634–639), composed this work between AD 610 and 615. It contains 70 *miracula*. Sophronius limited his work to recent miraculous healings about which he could obtain credible information, often referring to still-living witnesses. He was well acquainted with Abu Mena and included praise of the shrine in one of the *miracula* (*Miracula Cyri et Johannis* 46.1). Nevertheless, he considers Sts Cyrus and John to be more effective. There was undoubtedly a rivalry between the two shrines (Gascou 2006: 15), both of which strove to attract pilgrims and offerings.
2. The Arabic collection is undoubtedly a translation from the Coptic, but only one fragmentary Ms. of the Coptic original has been preserved (*BKU* III 382, LDAB 108306). The Arabic translation is preserved in multiple codices with up to 12 *miracula* in one Ms. The collection shares six *miracula* with Sophronius' work.[37] There is no edition but only a survey with some excerpts (Boutros 2008).

[36] For a detailed survey of the hagiographic dossier of Sts Cyrus and John, see Gascou 2007. Gascou (2006) is not a separate edition but a translation of Sophronius' collection. Still, it contains an extremely valuable introduction and notes. Gascou adds much to our understanding of the Greek text and has to be consulted along with the edition by N. Fernández Marcos. On the manuscript tradition of the *Miracula*, see Detoraki-Flusin 2019. A new critical edition of the *Miracula* by Marina Detoraki is currently in press and forthcoming in the *Corpus Christianorum, Series Graeca*.

[37] Sophronius of Jerusalem, *Miracula Cyri et Johannis* 18, 23, 24, 26, 34, 35. The list is given after Boutros 2008: 138–139.

3. A collection of five *miracula* in Greek preserved in Ms. Koutloumousiou 37 and edited by Vincent Déroche (2012; BHG 479b). *Miraculum* 5 is the same as *miraculum* 19 in Sophronius' collection. This collection can be dated after AD 633/4 (the date given in the first *miraculum* according to the regal year of Heraclius) and before the 660s (Déroche 2012: 214).

Appendix II
Concordance to the main collections of the Miracula of St Menas

The *miracula* bear titles only in some Greek Mss. The titles given below are merely conventional and have been provided to distinguish particular narratives. The Greek *miracula* are listed customarily according to BHG numbers, while the Coptic and Arabic are indicated by the order of their placement in the particular manuscript.

Because of the serious deterioration of M. 590, not all of the *miracula* from this Ms. have been edited. The editor (Drescher or Devos) is indicated in brackets. The sequence of the *miracula* included in this Ms. is given after Drescher (1946: 107). Although the *miraculum* "The Possessed Man" is not attested in the Arabic Ms. M, it appears in some other collections. Jaritz numbers it 24 (Jaritz 1993: 238–241). The *miracula* in which the name Philoxenite appears are printed in bold. Port facilities appear in the *miraculum* "Eutropius and the Silver Plates". The story entitled "The Wood-offering" also provides information on port traffic.

Miraculum **(conventional title)**	**Greek collection (acc. BHG = Pomâlovskìj)**	**Coptic collection acc. Ms. M. 590**	**Coptic collection acc. the IFAO Ms.**	**Arabic collection acc. Ms. Jaritz siglum M.**
The Isaurian Pilgrim	1	2 (ed. Drescher)	3	5
Eutropius and the Silver Plates	2	3 (ed. Drescher)	4	7
The Female Pilgrim (Sophia)	3	4 (ed. Drescher, in part)	5	9
The Jew and the Christian	4	8 (ed. Devos)	6 (in part)	10
The Paralytic and the Mute Woman	5	9		11
The Samaritan Woman	6	16 (ed. Drescher)		23
Three Brothers, the Pigs, and the Crocodile	7	10 (ed. Devos)		12
The Poor Woman's Sheep	8	14 (ed. Drescher, in part)		15
The Barren Camel	9	1 (ed. Drescher)		17
The Foal with Three Legs	10	6	2 (in part)	19
The Wood Offering	11	11		13
The Possessed Man	12	15 (ed. Drescher)		
The Pig Thief	13	5		18
The Pig Killed by the Daemon		7		20
The Soldier and the Pig		12		14
The Abused Female Pilgrim		13		4

Miraculum	Greek collection (BHG)	Coptic collection (Ms. M. 590)	Coptic collection (IFAO Ms.)	Arabic collection (Ms. Jaritz)
The Water Miracle		17 (ed. Drescher)		16
The Resurrected Worker				1
The Falsely Accused				2
The Possessed Jew				3
The Unjust Merchant				6
The Snake in the Vessel				8
The Pig Offering				21
The Stolen Horse				22

Appendix III
Attestations of the toponym Philoxenite

Collections of *miracula* in Coptic

Ms. Morgan Library and Museum M. 590:

- ϥιλοϫανειⲇⲏ (Drescher 1946: 13; "The Isaurian pilgrim")
- ϥιλοϫανιτⲏ (Drescher 1946: 22, 27; "The Female Pilgrim (Sophia)"; "The Samaritan Pilgrim")
- In the *miraculum* "The Jew and the Christian" (Devos 1960: 296), there is only the first and last letter preserved: ϥ[.....]ⲏ.

Ms. IFAO copte inv. 315–322:

- ϥιλοϫανιτⲁ (Bacot 2011: 44; "The Isaurian Pilgrim")
- ϥιλοϫενιτⲁ (Bacot 2011: 58; "The Female Pilgrim [Sophia]")
- ϥιλοϫενιτⲁ (Devos 1960: 289; "The Jew and the Christian")

Collections of *miracula* in Greek

- ἐκ τῆς χώρας τῶν Φιλοξενιτῶν (Silvano and Varalda 2019: 60; "The Female Pilgrim [Sophia]"). However, it is an emendation. The manuscript lections are given in the apparatus as follows (sigla of the Mss. after the editors): Φιλοξενιτῶν scripsi: Φενοζητῶν AngL, Φιοζητῶν Lo, Φενοζοητῶν V_1, Φαινοζεντῶν A_1 V_2, φαίνε ἡ ζητῶν V_3, Φενεζητῶν P_2, Φανεεντῶν A_4, φαϊζητων A_5, Φεκοζητῶν M/Pom.
- τὸν τόπον τὸν λεγόμενον Λοξονῆτα (Pomâlovskìj 1900: 63); *variae lectiones*:[38] Λοξονίτα Ang E_1 L V_1, Λοξόν εἶτα P_1, Λοξονήτα P_2, Λοξονίτην V_2, Λοξονίταν Me E_2, Λοξόν V_4, Λοξονίτων V_5 ("The Isaurian Pilgrim")

[38] I am greatly indebted to Luigi Silvano for checking manuscript lections for both "The Isaurian Pilgrim" and "The Christian and the Jew". The sigla not given in Silvano and Varalda (2019: 56–57) are: Ath_4 (Athon. ML Δ 50 [Eustratiades 426; *diktyon* 27361], 11th c.), E_1 (Escorial Y II 6 [Andrés 314], 12th c.), E_2 (Escorial Y II 9 [Andés 264], 11th c.), Me (Messina, Biblioteca Regionale Universitaria, SS. Salvatore, gr. 30 = Messan. gr. 30, AD 1307).

- τὸν τόπον τὸν λεγόμενον Λοξονῆτα (Pomâlovskìj 1900: 72); cf. Λοξονίτα (Devos 1960: 283); *variae lectiones*: Λοξονῆτα Ang, Λοξονήτα Ath_4, Λοξονίταν E_1, Λοξονῆταν Lo, Λοξονήταν P_2, Λοξονίτα L, Λοξόν P_1, Λοξονίτων V_5 ("The Jew and the Christian")

Collections of *miracula* in Arabic

- "The Female Pilgrim (Sophia)" (Jaritz 1993: 218, nos 4.10 and 6.7):
  - Mss. F i R: Iksābīṭa (اكسابيطا)
  - Ms. M: Fīlukṣānīḍā (فيلكصانيذا)
  - Ms. Ṣ: Iksālīṭā (اكساليطا)
- "The Jew and the Christian" (Jaritz 1993: 399, 420, nos 4.11 and 5.6.1):
  - Ms. F: Filuksānīṭā (فلكسانيطا)
  - Ms. M: Fīlukṣānīḍah (فيلكصانيذه)

Collections of *miracula* in Ethiopian

- Akteyāliṭā (አክትያሊጣ) ("The Female Pilgrim [Sophia]"; Ms. EMML 1827, fol. 105ra, 15th century)[39]

Old Nubian *miraculum*

- ϥιλοξενιτη (Browne 1994: 8–9, 11); Browne restores Greek Vorlage as Φιλοξενίτη

John (IV?) of Alexandria, *The Encomium of St Menas*

- ϥιλοξανιτη (Drescher 1946: 71)
- The *Life and martyrium of St Menas* based on the Coptic *Encomium* (Ms. Jaritz siglum N, Wadi an-Natrun, Dayr as-Suryānī, 14th to 15th century): Iksānīṭa (اكسانيطا) (Jaritz 1993: 119, 373).

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[39] I would like to thank Rafał Zarzeczny for reviewing the Ethiopian manuscripts and preparing the transcription. In most cases, the Ethiopian text does not refer to the town's proper name but rather to the "port of the church of Saint Abu Minas" (from "The Pig Killed by the Daemon"). This phrase also appears in some Arabic versions of the story. However, in Ethiopic, it is found in other narratives as well, such as "Eutropius and the Silver Plates" and "The Female Pilgrim (Sophia)".

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Chapter Four

PHILOXENITE, ABU MENA, AND THE FATE OF MAREOTIC VINEYARDS UNDER MUSLIM RULE*

Tomasz Barański

This chapter discusses the decline of wine production in the Lake Mareotis region, by which I understand the area located to the west and southwest of the ancient body of the lake, in the context of the abandonment of Philoxenite and Abu Mena. The viticulture thrived in the Mareotis region during the Roman and Byzantine periods including the establishment of quays and pottery kilns to facilitate the export of wine (Empereur 1998; Blue and Khalil 2011). The famous Mareotic wine was exported on a large scale within Egypt and beyond. It was stored in local containers, especially *amphores égyptiennes* (= AE) 3, 4, and 5/6 (Dixneuf 2011: 97–153; Dzierzbicka 2018: 65–70). Immediately before the Muslim conquest, wine was produced in the closest vicinity of the sanctuary in Abu Mena, though predominantly the pilgrimage destination, which is attested in numerous ostraca (Litinas 2008). The primary reason and the exact moment for the collapse of wine production in the early Islamic period is a matter of debate. Considering consumption needs in Medieval Islamic Egypt (Heine 1982), the survival of limited wine production during Muslim rule was reasonably proposed for the Mareotis region (Décobert 2002: 139–148). It is possible that viticulture persisted for several decades or even centuries after the mid-7th century as the collapse of wine production in the Mareotis region was not linked with the socially changing consumer preferences, at least not immediately after the conquest. The collapse of the agricultural output in the Mareotis region had multiple reasons. In this text, I want to explore whether human-induced or natural changes were predominant in this process.

The socio-economic history of Alexandria's hinterland in the early Islamic period, particularly the area near Abu Mena and Philoxenite, will be explored using literary sources, archaeological evidence, and the results of archaeobotanical and geoarchaeological analyses. Although this investigation does not offer new material studies, it gathers a variety of data and tries to reassume the discussion on the end of viticultural production in the Lake Mareotis region. The main question is whether the decline of agriculture resulted from inevitable natural changes or if human factors caused the collapse of the local economy and/or hydrological changes, and of course when this occurred. Firstly, I will describe the impact of the conquest on the agricultural zone between Alexandria and Abu Mena, as well as Alexandria itself whose inhabitants remained potential consumers in the early Islamic period. In the next two sections, the excerpts from the literary sources will be discussed with references to the results of the archaeological excavations in the Philoxenite and

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Abu Mena, respectively for the times of the Umayyads and the Abbasids. Another part is devoted to describing the social factor in the process of agricultural regression, i.e. the increasing importance of semi-nomadic tribes in the North-West Delta during the early Islamic period. Next, I attempt to reconsider the research issue in the context of hydrological changes attested by sedimentological analyses. Finally, I will briefly discuss the current state of knowledge and the objectives for future investigations before concluding with a summary.

The Muslim conquest and its aftermath

There is no archaeological material, nor written sources, documenting destruction in Abu Mena or Philoxenite during the Arab siege of Alexandria. The military actions in the proper sense of the word lasted a very short time, and it was not them that decided the surrender of Alexandria, but the progress of Arabs in the Delta and the final takeover of Babylon, the most important point of resistance. The Muslim forces entered Alexandria in September 642 under an agreement that allowed the imperial army, senior officials, and their families to leave (see Butler 1902; Booth 2016). In any case, temporally the war cut off these two sites from the rest of Egypt, let alone the Mediterranean world. Their isolation did not end immediately after ʿAmr b. al-ʿĀṣ captured Alexandria. There was still war at sea, and Byzantine forces attacked towns on the coast of Egypt. This could not fail to affect Abu Mena and Philoxenite unfavourably. During a certain time, there were no pilgrims from distant places, and even for the inhabitants of Alexandria opportunities to travel to the sanctuary of St Menas might have been less frequent. This state of affairs probably did not last long, for in the second half of the 7th century new rulers managed to stabilize their domination in Egypt, and Alexandria regained a considerable part of its economic importance.

After the Muslim conquest, the population of Alexandria decreased. However, it remained a large city. The negative effects of the demise of the political role were probably not immediately perceptible in the economic sphere. Alexandria quickly became an important military port where ships were built for the war with Byzantium. Thus, craftsmen and sailors were brought into the city. It also had its garrison, the size of which would be bolstered if needed. Alexandria could not continue to function without a large trade with the outside world, because its hinterland could not support all its needs. Merchants who came to the old capital would sell staples and luxury goods for an internal Egyptian market. Furthermore, the construction of ships would not have been possible without the wood, tar, and iron imported from Cilicia, Cyprus, Syria, and Palestine (Bruning 2022). All these facts are worth mentioning because in older literature it was regarded as obvious that Alexandria decayed after the Muslim conquest. This was mainly the result of a view that is nowadays rejected—the view that the early Islamic period was a period of deep crisis for cities or even was fatal to them. This was not the case for all cities, not in all places (see Wickham 2005: 591–692). The Muslim conquest, and what was happening at sea, cut Alexandria off from Constantinople, however, the city found itself a part of a huge state that encompassed many regions important for its trade across the Mediterranean Sea. The ceramics from the area of Gaza and from Cyprus that were found at Kom al-Dikka, for instance, document strong connections to other shores of the Eastern Mediterranean after the Muslim conquest, although Alexandria depended more and more on Egyptian products (Majcherek 2004; Bruning 2018: 75–86).

Assessing the extent of Alexandrian trade in terms of numbers is impossible. However, numerous Mediterranean merchants still frequented the port of Alexandria. Some of them, especially Christians, might travel further to Abu Mena, following the traditional route through Philoxenite for some time.

Irrespective of the possible damages that the military actions of the first half of the 7th century might have brought about, nothing suggests that the agriculture in the Lake Mareotis region was affected by a serious crisis in the second half of that century. There is no consensus among researchers regarding the condition of the renowned vineyards and wineries in this area. It is even difficult to establish the extent of wine production before and after the Muslim conquest. Mieczysław Rodziewicz, who based on the results of the excavations, was convinced that it was significantly reduced already in the Byzantine period, compared to Roman times. However, he also argued that the vineyards of the western part of the region, which produced wine exclusively for the needs of the pilgrimage to Abu Mena, developed more at the end of the Byzantine period (Rodziewicz 2011: 51). On the other hand, Christian Décobert argued that after the Muslim conquest wine production decreased in the western part of Mareotis but did not decrease in its eastern part. He took into account the archaeological data but the basis of his hypothesis was toponyms available from old maps of the region. They include numerous names beginning with *karm*, and its plural form *kurūm*, which stands for an orchard or vineyard in Arabic (Décobert 2002: 139–148). I assume he was more or less right, but who did acquire their products then? It seems obvious that as long as Alexandria remained a large city with a thriving economy, which was the case at least until the late 8th century (Bruning 2018: 59), it was the potential market for wine consumption.

Continuity and signs of crisis in the Umayyad period

The *History of the patriarchs of the Coptic Church of Alexandria* is the most instructive written source for the past of Abu Mena and the Lake Mareotis region in the period considered. According to the *Life of Agathon* (661–677), Yazīd b. Mu'wiyya, the son and successor of the first Umayyad Caliph, gave authority over Alexandria and Mareotis to a Chalcedonian, named Theodore. He received his status at the caliphal court in Damascus together with a declaration that the Muslim governor of Egypt had no jurisdiction over him. Theodore troubled Agathon but, as the narrator of this story explained, he was punished with a severe disease that made his hunger and thirst impossible to satisfy so he ate a lot and "drank daily one skin of Mareotic wine" until he died in agony (*History of the patriarchs* 3: 10). Nothing suggests the economy of Alexandria's hinterland was affected by a crisis in the second half of the 7th century.

The drastic changes for the worse in the agriculture of the Mareotis region began in the first half of the 8th century, starting with more restricted supervision over tax collection and oppression against taxpayers, including priests, monks, and laypeople. The harsh period started with the governorship of Qurra b. Sharīk (709–715) and lasted at least, until the time of influential official ʿUbayd Allāh b. Ḥabḥāb, although not a governor but a major overseer capable of all taxation (Ar. *Ṣāḥib al-kharaj*), who exercised almost full power between 724 and 734 (Kennedy 1998: 72–75; see Sijpesteijn 2018). At this time the fiscal oppression was said to have much increased and one

of the most troublesome regulations was that people had to carry a passport during one's travel. This policy had a damaging effect on the economy in the Alexandrian hinterland and trade was brought to a standstill. The intensified efforts to control the free movement of people also in other parts of Egypt are known from the numerous papyri dated from the first half of the 8th century (Kennedy 1998: 73; Legendre 2015). The restricted travel policy impacted the Lake Mareotis region as well. The author of *Life of Alexander II* (705–730) reported that in the year 96 AH/AD 714–715 the fruits of many vineyards near Alexandria were wasted and nobody could have bought them as their owners remained at homes, awaiting their passports to be issued (*History of the patriarchs* 3: 69). The restrictions on commuting could pose a major problem for wine producers who were searching for labour to work on their land. The seasonality of labour demand in a vineyard is rather high (Robinson 2015: 404–405). More workers were needed during the grape harvest and they must have come from other villages or even neighbouring regions located next to Lake Mareotis. Their movement was hampered in times of restricted travel policy, which could have led to the collapse of vineyards and villages that depended on wine production.

Philoxenite provides a fine archaeological example of settlement abandonment during the early Islamic period. The southwest part of the town had an irrigation system, indicating involvement in agriculture (Gwiazda, Derda, and Barański 2022: 367–368; Zalat et al. 2025). However, it did not necessarily mean wine grapes were cultivated immediately next to the town. Between the mid-7th and mid-8th century, Philoxenite gradually stopped being the town that we know from the architectural remains built in the second half of the 6th century for the movement of pilgrims. However, it was not abandoned at once. Firstly, Philoxenite changed its function from a rest stop to a more permanent settlement but for a more limited number of people. It is evident from some reconstruction works at the site that date back to the early Islamic period (Gwiazda, Derda, and Barański 2022; Gwiazda 2023). There is no archaeological evidence of hasty abandonment but the valuable materials from the buildings were extracted and reused elsewhere in that period. The town was still functioning in the first half of the 8th century as attested by the presence of post-Marwanid coinage issued as late as between AD 734 and 742 (Gwiazda 2023: 7–9). The pottery found in Philoxenite dates to the Umayyad period but no later forms typical for the Abbasid period were attested at the site. It seems the site was abandoned towards the mid-8th century as proved by the absence of the glazed pottery. The beginning of its production in Egypt and the Eastern Mediterranean is typically dated to the turn of the 8th and the 9th century (Gwiazda 2023: 9). Only Josef Engemann (2011; 2016: 125–129) who recognized a great number of them in Abu Mena postulated to date some of the glazed pottery forms as early as the beginning of the 8th century.

Although there was no evidence of grape growing, wine pressing, or pottery kilns in Philoxenite during the early Islamic period, it seems that it may have been used for shipment during its final stage. The port infrastructure in the town was still operating as evidenced by the ostracon from the 7th or the beginning of the 8th century, which mentions the reception of a large cargo of empty containers (Greek *kollatha*) (Derda 2020: 65–66). Moreover, these vessels might have been filled with local products, perhaps wine, however, the commodity is not clearly stated in its text. The reuse of old amphorae for transportation confirms that new containers were unnecessary for distributing liquid products such as wine. Nonetheless, certain pottery types may indicate the possible endurance of viticultural production in the Mareotis region. The extensive survey conducted by Lucy Blue's team in the western part of Lake Mareotis concluded that the settlement

which was also linked with pottery and wine production stopped in the mid-7th century (Tomber and Thomas 2011: 38). However, some types of pottery attested by them, including AE 5/6 that were used to store Mareotic wine, were also found in Philoxenite in the early Islamic contexts (Gwiazda 2023: 27). Thus, it is not unlikely that at least a part of the vineyards and ports in the western part of Lake Mareotis was still active after the second half of the 7th century or even in the first half of the 8th century when Philoxenite was still inhabited. Its port infrastructure could only have been used if the lake level was still high enough at that time, which will be discussed below.

The dispute over the sanctuary and water problem in the Abbasid period

In the middle of the 8th century, the Chalcedonian patriarch of Alexandria, Cosmas, attempted to reclaim the sanctuary of St Menas. This is recorded in the *Life of Michael I* (743–767) (*History of the patriarchs* 3: 118–134). Cosmas managed to obtain from Caliph Marwān II a letter addressed to the last Umayyad governor of Egypt, ʿAbd al-Malik briefly in office during turbulent 750 CE, requesting him to examine the dispute over Abu Mena between Chalcedonians and non-Chalcedonian Christians. As a result, ʿAbd al-Malik is said to have spent a lot of time listening to the representatives of both sides. After that, he transferred the matter to two judges who listened to both patriarchs again and requested that both parties present their arguments in writing. The legal case lasted for a long time and was complicated by bribes, though the author of the *History of the patriarchs* blames only Chalcedonians for this as the Monophysite patriarch is said to have refused to engage in such condemnable activities. The first two judges were eventually removed from the case and a pious Muslim who took their place finally agreed with Michael's arguments. The dispute over Abu Mena indicates that in the middle of the 8th century the sanctuary was still a source of significant income, despite the fiscal demands brought upon it by the Muslim authorities. Control over Abu Mena was also a matter of prestige, though this could only be a complementary factor. Gifts collected in Abu Mena were an important source of the patriarch's revenue as late as the beginning of the 9th century. This is indicated by a passage in the *Life of Jacob* (819–830), which recalls difficulties faced by the patriarch in the early years of his office: "Now that Amir began to act harshly towards the father in demanding taxes when he had nothing with which he could pay, as we related, through the poverty of the Church, arising from interruption of the pilgrimages to the church of St Menas, the Martyr, in consequence of the continual wars" (*History of the patriarchs* 4: 468–469).

However, the settlement discontinuity in Philoxenite suggests that as early as the mid-8th century, a century before Jacob's time, there was no significant influx of pilgrims to Abu Mena unless the main route to the sanctuary had changed. Therefore, Abu Mena's wealth at that time was perhaps derived from its land holdings including vineyards rather than visitors' gifts. Some clues about wine production and maybe even export can be derived from the medieval Islamic settlement in Abu Mena. The reoccupation of the so-called Pilgrimage Court is evidenced by the erection of a large villa in its northeast part, which could have been inhabited by the ecclesiastical authorities after the disastrous Persian conquest in early 7th century (Grossman, Arnold, and Kościuk 1997: 90–92). Peter Grossman dated the elite house with a central atrium-like court

cautiously to the 7th or 8th century at the latest (Grossman 2007: 129–130). According to a stratigraphical analysis and pottery studies, the so-called "Persian debris" upon which this villa was erected should have been formed rather in the 9th century, however, as it was mixed with glazed pottery (Kościuk 2009: 73; Engemann 2011: 352–353). At the western end of the Pilgrimage Court wine press and pottery kiln were installed in the early Islamic period. The former was built in the entrance to the former Great Xenodochium, while the latter was constructed close to the corner of the Baptistery (Grossmann and Stollmayer 2000: 104). Unfortunately, the exact relations of these structures with the aforementioned villa were not well recognized but they may have been correlated. Moreover, some locally produced pottery is known to be much more abundant in the early Islamic layers at Abu Mena, up until the 9th century. They include AE 5/6 which was used to store wine in the preceding centuries. However, the imported amphorae which were also attested in the early Islamic layers might have been better for the long-distance transport of liquids (Engemann 1992; Engemann 2016: 80–82, 94–95, 113–115).

The sanctuary of St Menas and the neighboring vineyards are last mentioned in the *History of the patriarchs* in the mid-9th century. Patriarch Shenoute (859–880) is told to perform a rain miracle in Abu Mena at the time of a severe drought because: "the heaven had not rained for three years, and the wells and the cisterns had become dry" (*History of the patriarchs* 5: 50). His prayers are said to bring rain that fills all the cisterns, revive the vines, and restore justice in a story that ends as follows:

> Our saintly father Anba Shenouti was informed that one of the priests at the church of the martyr Saint Menas had defrauded a woman (who was) a widow who had a piece of vineyard in his neighbourhood, and that he (the priest) had taken from it a part and had added it to his (own) vineyard. The father caused him to be brought to him and remonstrated with him and asked him not to commit (this) sin, but that priest did not accept (the warning) from him (Shenouti). Then he (Shenouti) rightly excommunicated him, and God caused a miracle to be manifested on his account because he had stamped upon the interdict with his feet. My brethren and my beloved, the faithful, believe this from me, and think nothing of worldly matters, but believe that God is Almighty. The rain which we mentioned descended upon all the lands and the vineyards, except (upon) the vineyard of that priest whom our father excommunicated. (*History of the patriarchs* 5: 50–52)

The lack of precipitation, as described in this story, could have negatively impacted some of the vineyards in the Mareotis region. The water usage in wine production, especially grape growing, is a complex matter because special water management needs depend entirely on the climate. The critical growth and ripening period occur in the late spring and early summer, which is a hot and dry season in the Mediterranean. Thus, irrigation has often been employed in Egyptian vineyards since ancient times (Robinson 2015: 378–379). Although people used rainwater cisterns, especially in places such as Abu Mena located far away from the lake, domestic and agricultural activities during the summer dry season were supplied with fresh water from the groundwater wells equipped with waterwheels. Water might have been taken directly from the lake through the irrigation canals, but only near the waterfront (Zalat et al. 2025). The increased level of pollution by the sewage from the latrines might have been problematic for water consumption locally in Philoxenite (Gwiazda 2023: 26) but could not affect agriculture.

Furthermore, the variability of lake salinity throughout the antique period was proved by the malacological studies (Mycielska-Dowgiałło and Woronko 2008), the composition of strontium isotopes test (Flaux et al. 2013) and fossil diatoms examination (Zalat et al. 2025). The growing salinity level could discourage its use directly from the lake even over seasonal fluctuations. Comparative analyses show that water in the wells close to the waterfront in Philoxenite is significantly less salty than that taken directly from the lake (Mycielska-Dowgiałło and Woronko 2008: 22–23). The natural ability of the local soil to reduce the salinity level of groundwater may have been essential for using water in households and agriculture throughout the entire Mareotis region.

The appropriate groundwater level seems indispensable for viticulture in many places across the Lake Mareotis region. It could have been enhanced in winter during rainy seasons. The special mounded embankments were constructed to prevent water from flowing down the plain. They were raised as high as 4 to 8 metres above the ground around the Mareotic vineyards to shield the arable land and concentrate water in a cistern or well (Müller-Wiener 1967). In summer, however, the groundwater level in this region depended on the Nile flow alone. The process of hydrological change which could affect this environment will be studied later. First, some remarks on the social history of the Lake Mareotis region must be discussed.

Bedouins' impact and the demise of settlement at Abu Mena

The reason for the definitive decline of Abu Mena and its agricultural hinterland, according to the written sources, was connected with the pillage by some Bedouins that happened during the time of the Patriarch Shenute (859–880) (Grossman 1998: 289). A hundred years prior, in the mid-8th century, the process of settling nomadic tribes from the Arabian Peninsula was initiated on the edges of the Nile Delta. Gradually, it changed local demographics. Most Bedouins became sedentary farmers, but some of them quickly adopted, or to be more precise readopted, pastoral lifestyle on the outskirts of the Delta (Mikhail 2014: 167–176). In the early 9th century, Egypt experienced destabilization due to a power struggle among members of the Abbasid family following the death of Hārūn al-Rāshīd in AD 809. This led to the ascent of local nomadic leaders to power in the Mareotis region. The western surroundings of Alexandria and, for some time, the city itself came under the control of two competing tribes: *Banu Lakhm* and *Banu Judhām* (Décobert 2002: 130–138). This social environment created a dangerous situation for sedentary Christian inhabitants and traveling individuals. Alexandria and its hinterland were in a turmoil of skirmishes between various tribes including two aforementioned and some newcomers from the west who were told to come from as far as Al-Andalus during the patriarchate of Mark III (799–819) (*History of the patriarchs* 4: 428–431). The tribes fought against each other and simultaneously looted the settled population. However, the opposite image of Bedouins towards Church institutions can be traced at that time. Bedouins are sometimes described as guards of the monastic communities (Décobert 2002: 136). These semi-nomads could also serve as representatives of the central government in al-Fusṭāṭ by collecting taxes on its behalf (Décobert 2002: 151). As nomadic warriors, they served various quarrelling sides and masters in the region, partly explaining that there were no serious attempts to eliminate them. Most significantly, however, the desert

warriors of the *Madāljah* tribe contributed to the twilight of Abu Mena in the mid-9th century. According to the *Life of Shenute*, the Bedouins destroyed lands and all property of the church of St Menas in Mareotis and other places (*History of the patriarchs* 5: 56–59).

Abu Mena could be resettled after this event but it seems to be a brief episode (Grossman 1998: 298). The occupation was concentrated in the western part of the town. This settlement was studied by Jacek Kościuk, who claimed that it could have existed even until the eleventh century (Kościuk 2003; 2009). The abundance of artifacts from the 9th century and the lack of later pottery sherds or coins suggest that this settlement was abandoned much earlier. Although two coins and three glass weights from the Fatimid period were found in Abu Mena, they are not strong evidence for such a long endurance of the settlement. These few pieces could have been brought later to the site by some visitors to the ruins (Engemann 2011: 351, 353). The sanctuary of Abu Mena could have fallen into ruin no later than the second half of the 10th century according to the estimation proposed by Christian Décobert (2002: 151). It is for the last time mentioned as functioning in *Kitāb al-Masālik wa-l-mamālik*, i.e. the *Book of roads and kingdoms*, by Abū ʿUbayd al-Bakrī (d. 1094) who, however, must have relied on earlier sources (Lévi-Provençal 1960). Besides the description of the church interior, al-Bakrī mentioned the surrounding landscape: "All the land round about is planted with fruit-trees, in particular: almond trees with soft bark and carob trees whose fruit yet green tastes like honey and syrups are made out it; there is plenty of vineyards as well, its products, both grapes and wines, are sent to Cairo" (*Kitāb al-Masālik wa al-mamālik*: § 1079–1081; see Butler 1902: 177–178, n. 2; De Slane 1913: 8–7; Jaritz 1993: 46–47). The wine, either from grapes or raisins, was consumed in Cairo as suggested in the mid-11th century by the physician ʿAlī b. Riḍwān (Dols and Gamal 1984: 91; Hansen 2019). Nevertheless, it appears unlikely that Mareotic wine continued to be exported in any quantities from Abu Mena after the 9th century, as indicated by the lack of pottery finds from the following periods.

As an aside, a very similar description used by al-Bakrī for Abu Mena was also noted by Étienne Quatremère (1811: 375–376) while discussing the town of Marea/Maryūṭ. He did not know yet that the report of the "anonymous Arab geographer" he studied was another copy of al-Bakrī's work.[1] Furthermore, there is also a short note, overlooked by earlier scholars, in al-Bakrī's description of the town of Maryūṭ saying that it is located "between Alexandria and Wādī al-Farʿāna", rather than Wādī al-Farġāna as in the edition (*Kitāb al-Masālik wa al-mamālik*: § 1076), still being an enigmatic toponym. This piece of information, however, cannot help to discover the localization of the Marea/Maryūṭ town which was discussed by many scholars, especially when the primary identification of the archaeological site of "Marea"/Philoxenite was put in doubt (Rodziewicz 2010; Wipszycka 2012). The toponym Maryūṭ was used interchangeably for the lake, the town, and the Mareotis region in medieval Arabic sources. Furthermore, it is not even certain if the medieval town of Maryūṭ can be identified with the long-searched Marea, which is sometimes supposed, with no solid argument, to have existed from the times of King Inaros in the 5th century BC up to the medieval period in the same place (Décobert 2002: 148–160).

[1] Ét. Quatremère referred to the older inventory number (BNF Ms. Arab. 580), while the new inventory number (Arabe 2218) was assigned later. The manuscript can be consulted online at https://archivesetmanuscrits.bnf.fr.

A hydrological change and the collapse of Mareotic vineyards

The size of Lake Mareotis was crucial for irrigation and navigation, both important elements for the production and export of local wine, as postulated more than once above. The team of Clément Flaux has already reconstructed some reconfigurations of Lake Mareotis using historical records, stratigraphic sequences, and bio-sedimentological data from boreholes (Flaux et al. 2012; 2013; 2021) which generally agrees with new studies (Zalat et al. 2025). The most important process, which has to be discussed for the benefit of my study, is the desertification of the Lake Mareotis region that happened in the medieval period but the reasons for this hydrological change could have been activated earlier.

For some time, it has been thought that Lake Mareotis became salty and degraded only after the seawater was admitted through a dyke that was destroyed deliberately by the British army during the Napoleonic campaign (De Cosson 1935: 88–93). However, the lake has undergone many hydrological changes for millennia. The seawater intrusions into Lake Mareotis through the Abukir basin happened in the past, however, the maintenance of the Alexandrian canal and the natural progradation of the Canopic mouth constrained this process in antiquity. The seawater input may have been temporarily possible also via the al-Max canal to the west of Alexandria (Flaux et al. 2012: 3500). Nevertheless, the brackish lake formed in the Hellenistic period in place of a former marine lagoon was water-fed in essence with the Nile throughout the Roman and Byzantine periods, especially during annual flood discharges. The partial desalinization of the Lake Mareotis region could have been crucial for human occupation and economic development in the northwestern Nile Delta margin (Flaux et al. 2021: 102). The seasonal changes in the Nile's flood volume had a major impact on the lake's size but the overall river flow does not appear to be a major drive for all its hydrographical changes. The Canopic branch, which was responsible for the freshwater input to the lake via numerous canals, gradually silted up at the end of the Byzantine period, while the Rosetta branch in the east became predominant during the medieval period (Flaux et al. 2012: 3502). The inland waterway towards Alexandria moved from the former to the latter which is proved by a papyrus text of AD 735 (Sijpesteijn 2004: 115–122). Lake Mareotis was transformed from a high-level, hypohyaline coastal lake to a periodically flooded *sebkha* between the 9th and 10th century (Flaux et al. 2012: 3499–3500). The man-made freshwater supply system of Alexandria and the irrigation canals serving the agricultural hinterland are claimed to be the crucial factors for the deviation of Canopic water and the silting up of its main channel that deprived Lake Mareotis of the Nile water inflow (Flaux et al. 2012: 3501–3503). Nevertheless, some high-energy events could influence this hydrological change as well. For example, the sudden submergence of the Canopic lobe caused the sinking of East Canopus and Herakleion below sea level in the mid-8th century, which resulted in the opening of the Abukir basin (Stanley, Goddio, and Schnepp 2001; Crépy and Boussac 2021: 41). Furthermore, some mixed layers recognized in the core samples drilled from the bottom of the ancient body of Lake Mareotis are to be explained, cautiously but for now with no alternative, with a high-energy event such as a tsunami. This particular event is associated with the seawater flooding in either 811 or 881, as known from written sources (Goiran 2012). The wave could hit the Alexandrian coast, overflow across the urban tissue, and then erode lake-bottom sediments impacting not only the coastal waterfront but also the lakeside resulting in a significant change of the Lake Mareotis ecosystem in the ninth century (Flaux et al. 2021: 101–102).

Discussion and objectives for future research

The navigation and groundwater in most parts of the Mareotis region depended on the lake's size. Lake Mareotis was still an important source of fresh water for household and agricultural purposes even after the Muslim conquest. It is unclear whether the critical point in the lake water budget was reached due to the decreasing Nile inflow or the opening of the lake to the Mediterranean Sea. Both were probably important factors in the formation of a periodically flooded *sebkha* on the site of a former navigable brackish lake. The reduction in rainfall, global or local, could also contribute to the desiccation process. However, no studies in the North West Delta margin have been carried out, so far, to prove any climatic change, compared with other parts of the Mediterranean Sea during that period (Labuhn et al. 2019). Perhaps, the desertification of the Lake Mareotis region was just a part of the larger process that resulted in a reduction of the number of occupied sites in the North-West Delta during the early Islamic period as was evidenced in recent surveys (Wilson and Grigoropoulos 2009: 282–284; Kenawi 2014: 223–226). So far, however, I cannot determine whether human-induced irrigation and its subsequent partial abandonment during the early Islamic period, or natural factors such as sudden events linked with the opening of the lake to the sea, were responsible for the collapse of the environment that once enabled agricultural production, including viticulture. Philoxenite and Abu Mena were abandoned most likely in the mid-8th century and the 9th century respectively. These dates are more or less congruent with the two aforementioned high-energy events. So far, however, it is impossible to demonstrate a correlation between these natural disasters and the settlement discontinuances in the Mareotis region. More natural catastrophes touched Alexandria and its hinterland in the past obviously (Taher 1998).

The wine production could survive in the Mareotis region before the water became too saline for human needs and its main body became too shallow to navigate. The end of the 9th century, which is the liminal moment from the point of archaeological evidence, falls within the range defined by major environmental change, which gained its momentum in the 9th or 10th century. The desertification process was probably not simultaneous in all parts of the Mareotis region. The western part of Lake Mareotis is narrow and shallow, making it more susceptible to hydrographic changes. New hypotheses on the environmental changes influencing the size of the lake, and its western arm in particular, consider variability in water levels of high frequency, the existence of several independent lakes, or even water engineering on large scales in the Roman and Byzantine periods (Crépy and Boussac 2021). Wine production could survive longer in the area to the northeast of Abu Mena, where remnants of vineyards were still present as late as the mid-20th century (Müller-Wiener 1967). For example, in Kurūm al-Ṭuwāl, a site surveyed before modern agriculture replaced the area and eradicated the possibility of gathering more information about its archaeological past. The presence of glazed pottery suggests that it was inhabited even in the 9th century (Eilmann, Langsdorff, and Stier 1930: 108). However, it is uncertain whether its previous function, i.e. winemaking, was still practiced in the early Islamic period.

The history of agriculture is increasingly studied through the application of archaeobotanical methods (Izdebski et al. 2020). Palynological analyses are one of the most convincing pieces of evidence for viticulture. Modern studies of ancient deposits, particularly filled wells, involve pollen analysis combined with radiocarbon dating that can provide insight into environmental changes including agricultural production (Peña-Chocarro et al. 2019). Although some projects were

initiated in the past with limited conclusions (Petruso and Gabel 1982: 14), only one research study in the North West Dela margin included pollen analysis. It was done in Alexandria's Eastern Harbour and has promisingly shown a constant presence of the vine pollen (Lat. *Vitis*) during the last three thousand years (Stanley and Bernhardt 2010: 72, 76). The reason for the lack of palynological examinations in the Lake Mareotis region is unknown. Perhaps, palynomorphs may be difficult or impossible to detect in some contexts. For example, a preliminary sample was taken from the Ch2 building, which is located in the southeast of the "Marea"/Philoxenite site in 2020 (Gwiazda, Derda, and Barański 2022: 342–347; Derda, Gwiazda, and Burdajewicz 2023). This soil sample was retrieved from the bottom layer of the small water tank, which contained a variety of pottery forms characteristic of the latest phase of the site's occupation. Unfortunately, it has shown no palynomorphs. Despite this failure, further pollen examination in the Lake Mareotis region can bring more information on the history of agriculture including wine production.

The history of wine production in the Mareotis region must be seen in comparison with other parts of the Eastern Mediterranean, such as the Palestinian coast and the Negev, where many studies have recently focused on winemaking in Late Antiquity. The wine was produced in early Islamic Palestine for sure, however, its quantities were no longer comparable to the large-scale export of the famous Gaza wine in the Byzantine period (Fuks, Avni, and Bar-Oz 2021; Avni, Bar-Oz, and Gambash 2023). The presence of Egyptian Bag-Shaped Jars, also referred to as Abu Mena amphora, albeit in a relatively small number, and other containers such as the Nile-silt-made "Red-Brown Ovoid Amphorae / RBOA", much more numerous, both belonging to the AE 5/6 type, indicate strong economic contacts between Palestine and Egypt in the early Islamic period. Nevertheless, it cannot incontestably attest to the significant size of wine export from Egypt because other commodities transported in these containers were also demanded including fish sauce, date purée, and natron. The volume of wine production seems to mainly meet local needs both in Egypt and Palestine at that time (Taxel 2024: 159–165). Moreover, the present debate on viticulture in Southern Palestine, and Negev Highlands in particular, tends to emphasize the time of decline as early as the second half of the 6th century. The collapse of the wine-making economy in these lands, several decades before the Persian invasion and almost a century before the Muslim conquest, is possibly linked with a variety of natural triggers such as pandemics (Justinian plague), climatic changes (Late Antique Little Ice Age), or change of local environment (sand dune mobilization) (Avni, Bar-Oz, and Gambash 2023: 11–14). These factors, or at least some similar stressors, need to be considered in future studies when reassessing the timeline of pottery and wine production in the Mareotis region. Furthermore, fieldwork should be aimed at detecting a wider range of production structures than just wine presses and ceramic kilns, for example, pigeon towers or dovecotes, which were a significant source of manure for fertilizer (Fuks, Avni, and Bar-Oz 2021: 161).

Summary

The historical and archaeological evidence mentioned above provides some clues about the possible continuation of winemaking in the Lake Mareotis region after the Muslim conquest. This activity may have lasted until the early 8th century near Philoxenite, or even until the 9th century

near Abu Mena and in the zone closer to the main body of the lake. However, it was doubtlessly on a much smaller scale compared to the Roman and Byzantine periods. The demand for wine must have been high in Alexandria, which remained a large city in the early Islamic period. It is difficult to assess the human factor in the process of desertification of the area under consideration. The state's travel policy regulations may significantly impact wine production, much like the long-term changes in the hydrological system due to lack of irrigation maintenance. The multidisciplinary team, which investigated stratigraphic sequences retrieved from cores drilled in several localities in the Mareotis region, has previously stated that "political disruptions and socio-economic changes between the 7th and 9th centuries AD were key drivers of Maryut desiccation during the 9–10th centuries AD" (Flaux et al. 2012: 3503). However, new ideas related to environmental changes of Lake Mareotis and the progressive silting up of the Canopic branch cannot exclude the impact of natural forces, also such as high energy events on the coastal line and irrigation system of the North West Delta during the historical times (Flaux et al. 2021: 102). The settlement pattern of the Mareotis region has likely been influenced quite frequently by changes in the natural environment and the variability of lake size throughout history. A non-anthropogenic factor may have influenced the transformation from a brackish lake to an arid *sebkha* more than we suppose now. Nevertheless, the water budget in the 8th or even in the 9th century seems to be positive enough so that it could have provided Lake Mareotis, at least around its main body, with freshwater indispensable for agricultural production but fewer and fewer people were willing to run once famous vineyards in challenging social and environmentally unfavorable conditions anyway.

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Chapter Five

MAPPING "MAREA"/PHILOXENITE: THE RESEARCH SINCE THE END OF THE 18TH CENTURY

Andrzej Bruno Kutiak

Early topographical mapping of the site

The remains of built structures located on the peninsula at Lake Mariout were noticed by land surveyors at the very beginning of the scientific research of Egypt.[1] The place called "Marea" was recorded on the first general map of Egypt, *Ægyptus Antiqua* appended to the *Description de l'Égypte*, in the first volume of *Antiquités (Planches)*, published 1809. This map was executed by Jean Baptiste Bourguignon d'Anville (1697–1782) dated 1765, where "Marea" was placed on the northern bank of *Mareotis Lacus* and the shape of the lake only roughly represented its real extent in antiquity [***Fig. 1***]. It was only under direction of the cartographer Pierre Jacotin (1765–1827) that a precise mapping of Egypt was created. The engineers responsible for the area here in question were: Legentil, Taskin, Picault, and Vinache, who surveyed the area during Napoleonic campaigns. Their work was incorporated in the volume of *Carte géographique de l'Égypte*, published in 1818 and republished in 1826. The old map of d'Anville was reproduced in the second edition as the first in the map volume, contrasted with the detailed recording of the land topography of the new survey.

Around 1800, the site of interest was rendered in surprising detail, taking account of the scale of the published maps, but was not always consistently described. This survey obtained three redactions to the scale, all three constituting the one abovementioned volume *Description de l'Égypte.* The overview (*feuille* no. 3 in the second edition), with reduced detailing was on a scale of 1:2,500,000, the three-part map—on a scale of 1:1,000,000, and the most detailed one—at 1:100,000. The names only of the most important sites were recorded on the first one of these; on the second map (*feuille* no. 2 of the map on a scale of 1:1,000,000), the whole region south of the peninsula of the site was designated in capital letters (*MAREA*), but—apart from the general outlines of the peninsula—nothing can be ascertained about the remains themselves [***Fig. 2***]. However, *feuille* no. 37 of the map on a scale of 1:100,000 provided a relatively detailed image of the topography and remains on the site: a main road from the east runs along the southern shore of the lake before it turns northwards along the eastern shore of the peninsula. The causeway leading to the island was also rendered although the outline of the peninsula was distorted—the much lower water level must be taken into consideration (four feet in the deepest place between peninsula and the northern lakeshore according to the map). In contrast to its vicinity, the pen-

[1] For the extensive study on the maps of the whole Mareotis region, see Awad 2010a; 2010b; Shaalan et al. 2018; Awad 2020; Nenna et al. 2021; Awad 2023. I would like also to express here my sincere thanks to Ismaïl Awad and Centre d'études alexandrines for making in November 2021 the historical maps of the survey 1940 from their archives available for this study and help of Thomas Faucher with obtaining them.



Fig. 1. The plan of ancient Egypt by Jean Baptiste Bourguignon d'Anville (1697–1782), published for the first time in 1765. It was republished in 1809 as an introductory map to the first volume of *Planches: Antiquités*, being the eleventh book of *Description de l'Égypte* (source: *Description de l'Égypte, Antiquités, Planches. Tome premier* [1809]. Rare Book Division, The New York Public Library, No. b14212718, 51 × 62 cm)

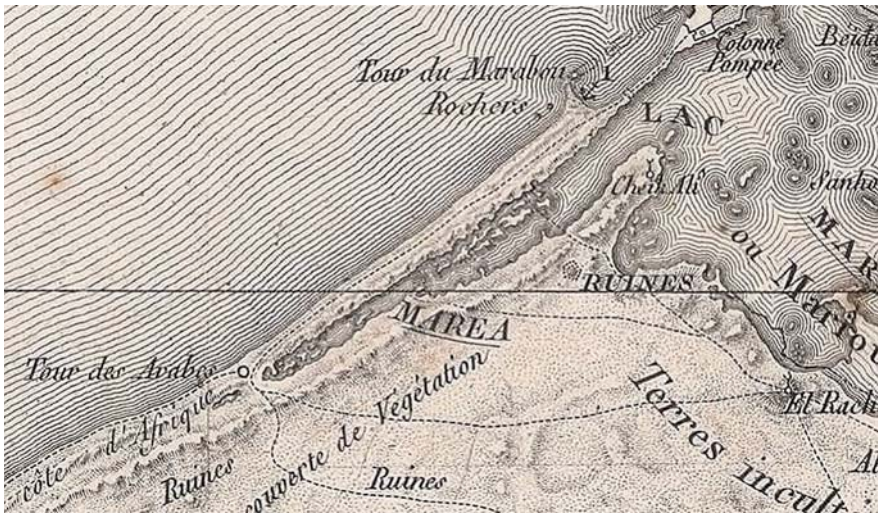


Fig. 2. Fragment of a map on a scale of 1:1,000,000 with the location of the "Marea" site. This map was incorporated in the volume of *Carte géographique de l'Égypte* published 1818 and republished in 1826 (source: Rumsey Collection, List No. 3964.005, 125 × 83 cm)

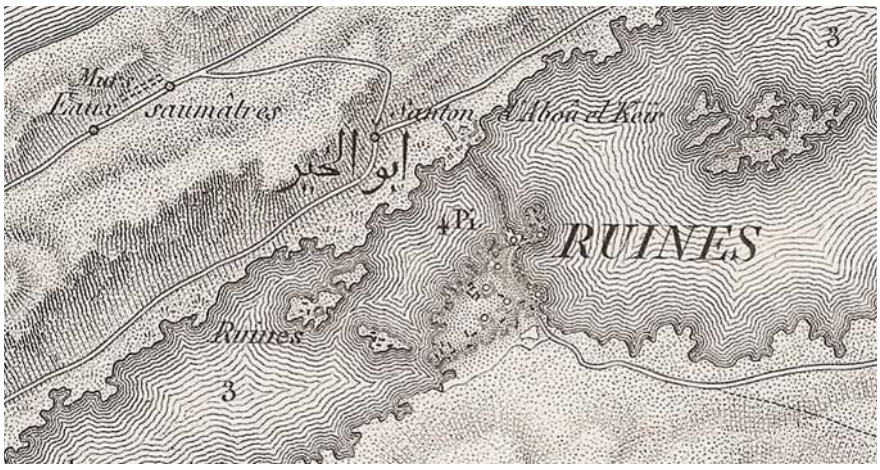


Fig. 3. Fragment of a map on a scale of 1:100,000 with the location of the "Marea" site. This map was found on the 37th sheet in the volume of *Carte géographique de l'Égypte*, published 1818 and republished in 1826 (source: Rumsey Collection, List No. 10404.864, 53 × 80 cm)

insula must have intrigued and kept the surveyors very busy: seven circles without hatch were marked among the symbolic indication of ruins. No such round symbol was included in the map key: a hatched circle referred to well and an empty circle with rays to a mill. In the case of our site, they might have referred to the places where the remains of waterwheels were located (this descriptive term will be here prioritised over the Arabic term ساقية of unstable transliteration *saqquia*/*sāqiyah*/*sakia*/*sāqia*/*saqiya(h)*). Their circular forms can be still traced on the surface, and it can be assumed that in the Napoleonic era they were even more apparent. One more feature is notable: a causeway joining the peninsula with the northern lakeshore at Sidi Krir (*Aboû el'Keïr*

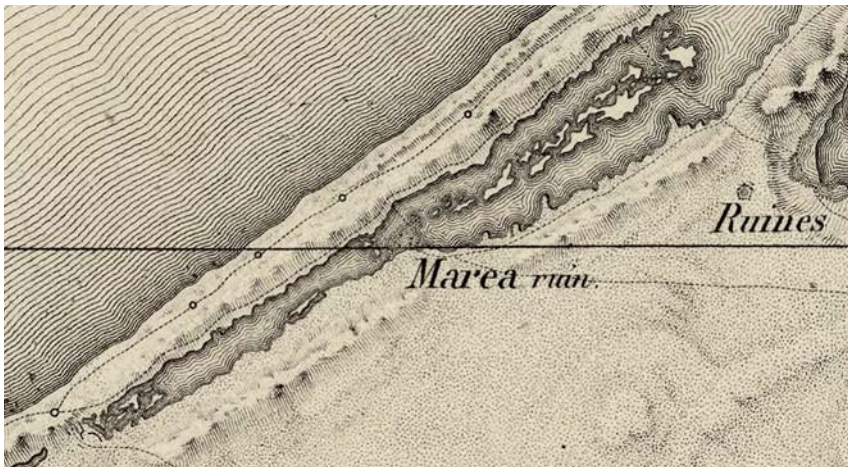


Fig. 4. Fragment of a draft version of *Carte hydrographique de la Basse Égypte* on a scale of 1:400,000, in its final versions attached as planche no. 10 to the first volume of *État moderne, Description de l'Égypte* (source: Gallica: Bibliothèque nationale de France, département Cartes et plans, GE C-11316, 60 × 90 cm)

on this map; the variable spelling forms used in the sources will be given in italics in the following text). This element will be later discussed with the topographical context of the site. The name of the peninsula remained—in contrast to the second map of that volume—unspecified, marked only by the general descriptive tag *RUINES* [***Fig. 3***].

The last map from *Description de l'Égypte* to which attention should be drawn was attached as *planche* no. 10 to the first volume of *État moderne* in both its editions, 1809 and 1822. This map was *Carte hydrographique de la Basse Égypte*, executed on a scale of 1:400,000, also prepared under supervision of Pierre Jacotin and Gratien Le Père (1769–1826), though lacking the detail of the previous map. The possibility of crossing the lake from the northern part of the peninsula to the opposite lakeshore was marked with dashed line and the place was named *Maréa ruinée* in the published versions. This rendering did not deliver any substantial knowledge about the form an ancient settlement but only its location. The ruins were marked as being scattered—according to the map authors—over almost the whole area of the peninsula [***Fig. 4***].

The first known description of the site, and also the first significantly detailed one, was published in 1829 in the eighteenth volume of *Description de l'Égypte.* It was rendered by cartographer Gratien Le Père, who—more than a century before the arrival of the archaeologists—noticed the most characteristic elements of the site as piers, harbour infrastructure and the remains of monumental buildings, but let us hand over to him:

> Le chef de brigade, M. Cavalier, recherchait des ruines plus intéressantes qu'il avait déjà visitées, et qu'il voulut me faire voir. Ces ruines se trouvent sur la rive sud du lac Maréotis, vis-à-vis le santon d'Abou-el-Kheyr, situé sur les bords de la rive opposée, que nous avions visitée deux jours auparavant; elles consistent dans les vestiges encore très-marqués d'une double enceinte de ville forte, réduite à un et deux mètres de hauteur seulement, flanquée de tours rasées, terminées au nord-est par un môle avancé dans le lac. Quatre autres môles, dirigés semblablement, forment autant de vastes bassins ou havres. L'eau de mer commençait à baigner le pied de ces môles, dont

> l'élévation est de deux à trois mètres sur le fond de la plaine saline du lac. Dans l'intervalle de deux de ces môles se trouve une rue qui descend, par une pente assez rapide, au niveau de cette plaine, en traversant les restes d'un édifice qui paraît avoir été une porte de ville sur le lac. La construction de ces môles présente un grand appareil; bâtis avec art, ces murs de quai, en forme de jetées, attestent que cette ville eut un port très-commerçant. Tout le reste de son site est couvert de ruines et de décombres de fabriques, de fragmens (sic!) de grès, de granit, de marbres de toute espèce et de monceaux de pierres de taille. On ne peut douter un instant que ces ruines considérables, situées à trente milles mètres environ au sud-sud-ouest d'Alexandrie, n'appartiennent à Maréa, l'ancienne capitale du nome de son nom.[2]

From among numerous maps published in the subsequent years and based on those previously described, one is of special importance—the map on a scale of 1:200,000 of the environs of Alexandria published in 1866 under the supervision of Mahmud Bey Ahmed el Falaki (1815–1885). Although its scale is bigger than that of the previous map, its topographic accuracy is more confined. Most of the peninsula was marked as bearing ruins and was labelled *Ruine de Marea*. The path leading from the peninsula to Sidi Krir (*Abou Alkheir*) was not recorded. This map presents,

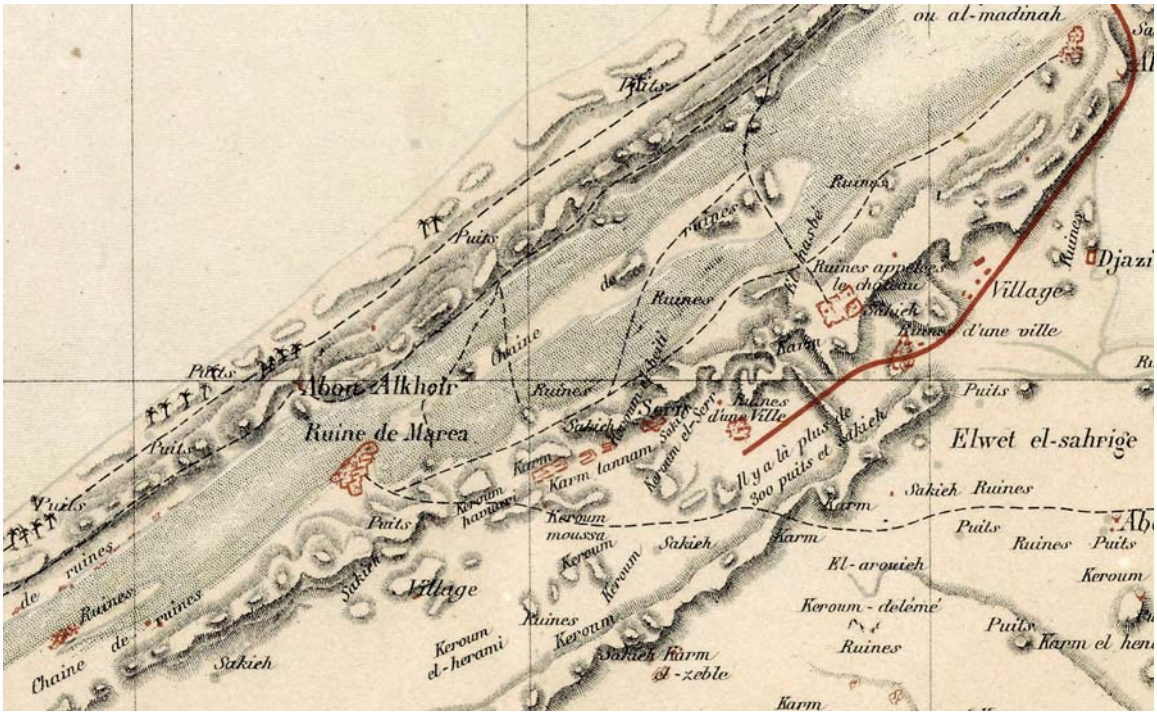


Fig. 5. Fragment of the map depicting the vicinity of Alexandria on a scale of 1:200,000 by Maḥmūd al-Falakī published in 1866. The range of the ruins at the peninsula of "Marea" repeats that known from the maps of *Description de l'Égypte* (source: Gallica: Centre d'études alexandrines, 36 × 55 cm)

[2] Le Père 1829: 47. On the subsequent page he offers a description of an intriguing structure in the distance, 1.2–1.5 km in the direction southwest from the site in the dry bed of the lake—it is supposed to have been a rectangular enclosure of dimensions 20–25 × 50–60 m constructed in the manner of the piers of the peninsula. For the author's description of Mareotis, see also Le Père 1823.

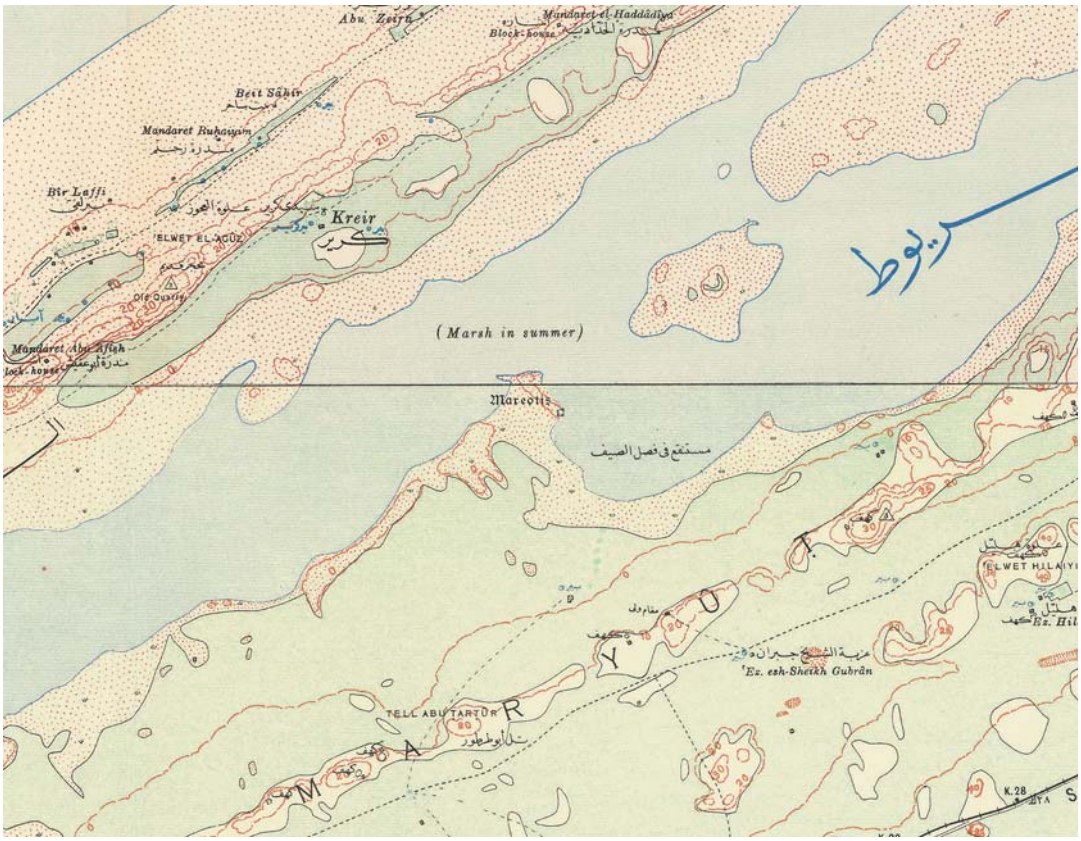


Fig. 6. The peninsula in focus as documented by the survey which took place between the years 1907–1908 and published in 1910. The border between sheets on a scale of 1:50,000 runs through the island north of the peninsula, which was then part of the mainland due to the lower water level. The border between sheets is seen as a black line, as both sheets of this survey were digitally conjoined: the northern one of Kreir (Sidi Krir) and the southern one of Bahîg. Maps of this survey have significant value as many of the *karms* and *koms* south of the lake were documented (source: Rumsey Collection, sheet no. 20 [Kreir], List No. 10285.029, 51 × 52 cm; sheet no. 47 [Bahîg], List No. 10285.042, 51 × 52 cm)

however, many more ruins in this region than the previous ones, giving an image of a once extensively inhabited area [***Fig. 5***]. The ruins were subsequently recorded several times at different scales and at different depths of detail, but without contributing to their better rendering, such as on the revised edition of 1882 of the map *Carte hydrographique de la Basse-Égypte et d'une partie de l'isthme de Suez* at a scale of 1:250,000, supervised by Louis Linant de Bellefonds (1799–1883) and originally issued in 1855.[3] On the map on a scale of 1:200,000 from the year 1882 by the Intelligence Division in Great Britain's War Department, the ruins of the peninsula were marked as *Assarat Khedimeh (Ruins)*.[4]

[3] See also Rodziewicz 2003: 33.

[4] The name is transliteration of Arabic آثارات قديمة (ancient ruins). On this map also further west the *Ruins of Kadimeh* were marked, which might refer to the church complex of Sidi Mahmud or a winery complex in the western part of modern Burg el-Arab. Map in the Special Collections Library of the American University in Cairo. Sincere thanks to Tomasz Barański for elucidations of the Arabic terminology.

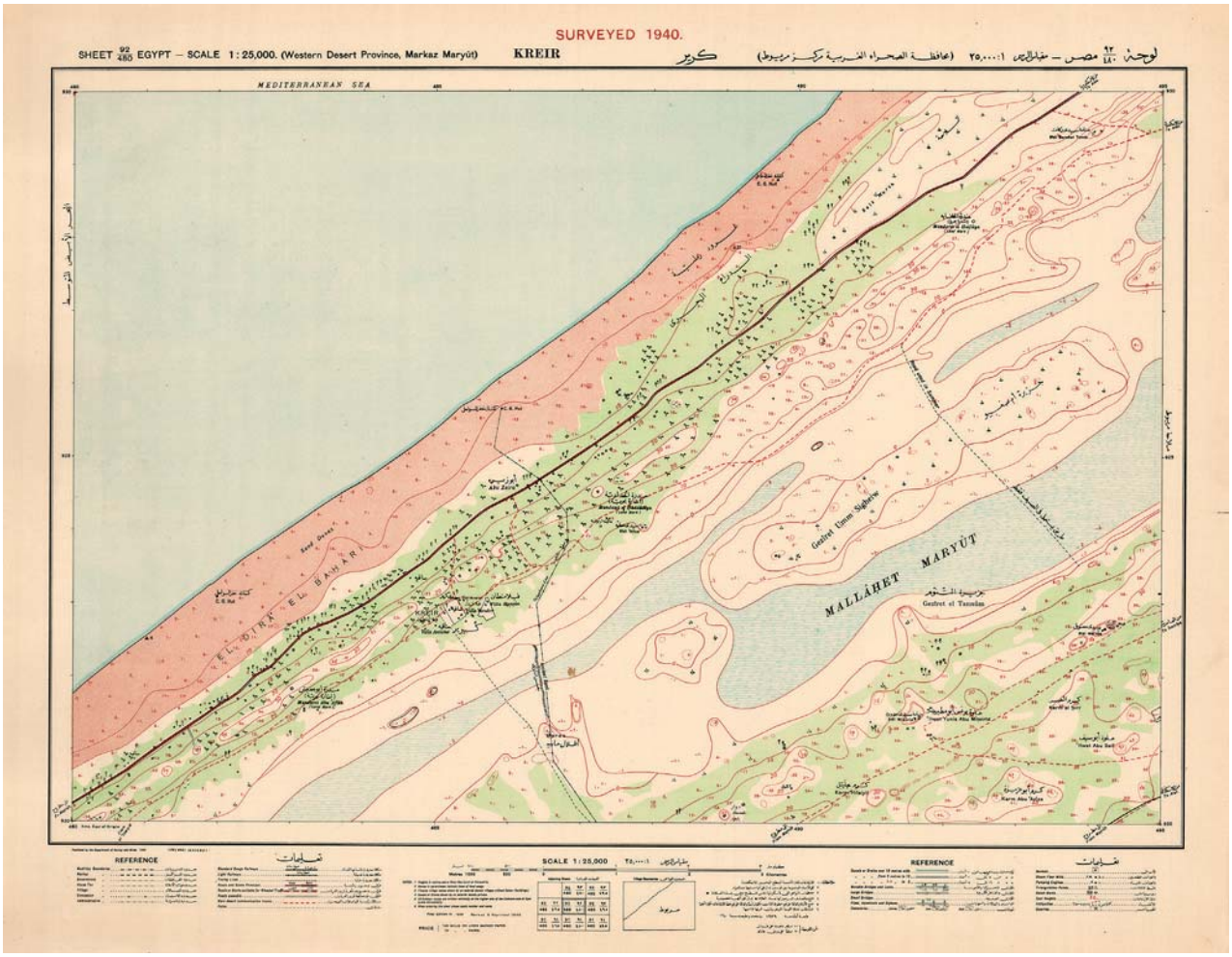


Fig. 7. Sheet 47 of the survey of Egypt map on a scale of 1:25,000, which was first published in 1939, here in the reedition of 1940. The lowered water table of Lake Mariout is noticeable when compared with the survey of the years 1907–1908. Despite its larger scale compared to the previous one, in this survey only a few more elements of ancient topography can be traced, such as the piers on the site (P3 and P5) (source: Musée royal de l'Afrique Centrale, sheet no. 92/480, Inv. 036478, 57 × 88 cm)

Some maps from the 20th-century surveys of Egypt, even though registered on a scale of 1:10,000 (the area in focus surveyed from 1907–1910, reprinted with corrections in 1914) and 1:25,000 (survey of 1940), did not provide a more detailed map of the site. In the case of the latter survey, the water was even lower than during the French survey in the Napoleonic era and the surface water level was 2 m below the sea level, so the width of the water basin north from the peninsula was not broader than 200 m. The causeway known from the first maps was described on the 1940 map as an *Ancient Bank*, and its location can be seen as prolonging the pier directly north from the basilica towards the village of *Kreir*.[5] The name *Mareotis* in the 1914 edition and *Marea* for the 1940 map was used for the complex of the ruins at the peninsula [***Figs 6 and 7***].

[5] Also noticed in Crépy and Boussac 2021: 47; see also Le Père 1829: 49.

Archaeological mapping in the 20th century

The more detailed map depicting the disposition of remains of the various settlements in the region was published by Anthony de Cosson (1883–1940) (1935: 134–135) [***Fig. 8***] and gave insight into the main communication axes of the settlement. For the first time, four piers were recorded (including the pier at the island), as well as the causeway leading to the island, which were during de Cosson's time integrated with the peninsula because of the lower water table [see ***Fig. 8***]. An important map, although only on a scale of 1:200,000, was produced by Wolfgang Müller-Wiener (1923–1991) in 1967 (Müller-Wiener 1967: Fig. 1). The map was based on the surveys conducted in 1926–1930, published on a scale of 1:100,000, and supplemented with the author's own research. The ruins at the peninsula were named *Marea*. Another complex of ruins, 2 km south of the peninsula, and almost as big as those in the north, was designated *M.* The latter area was an urban settlement referred to in the later archaeological literature as Mit Abul Kom.[6] This map plays an important role in understanding the character of the vicinity of

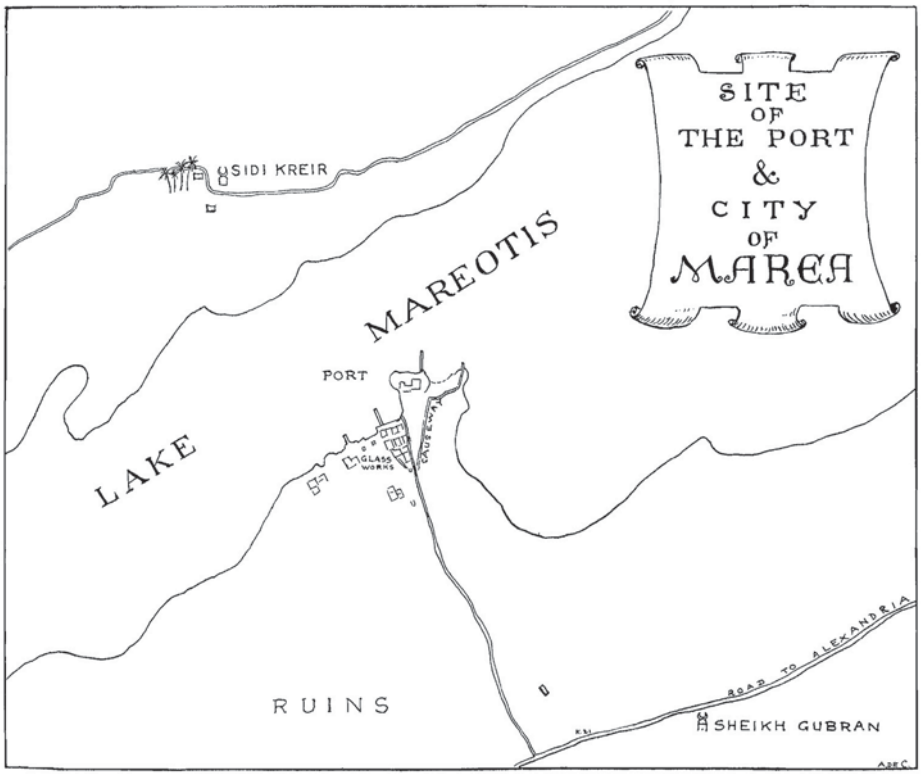


Fig. 8. Disposition of the site as drawn by Anthony de Cosson. Of the various structures noticed by him were the piers and the causeway (P1–P4), the built-up areas of districts A, D, E, and F (see Chapter 6), probably the grange complex and glassworks, which could be hypothetically identified with the recently surveyed structures of kilns (FR1 and FR2) (after de Cosson 1935: 134–135)

[6] Fournet, Redon, and Vanpeene 2009: 494–495. The place was also treated as a part of Hawwariya (Haggag 2010: 53).

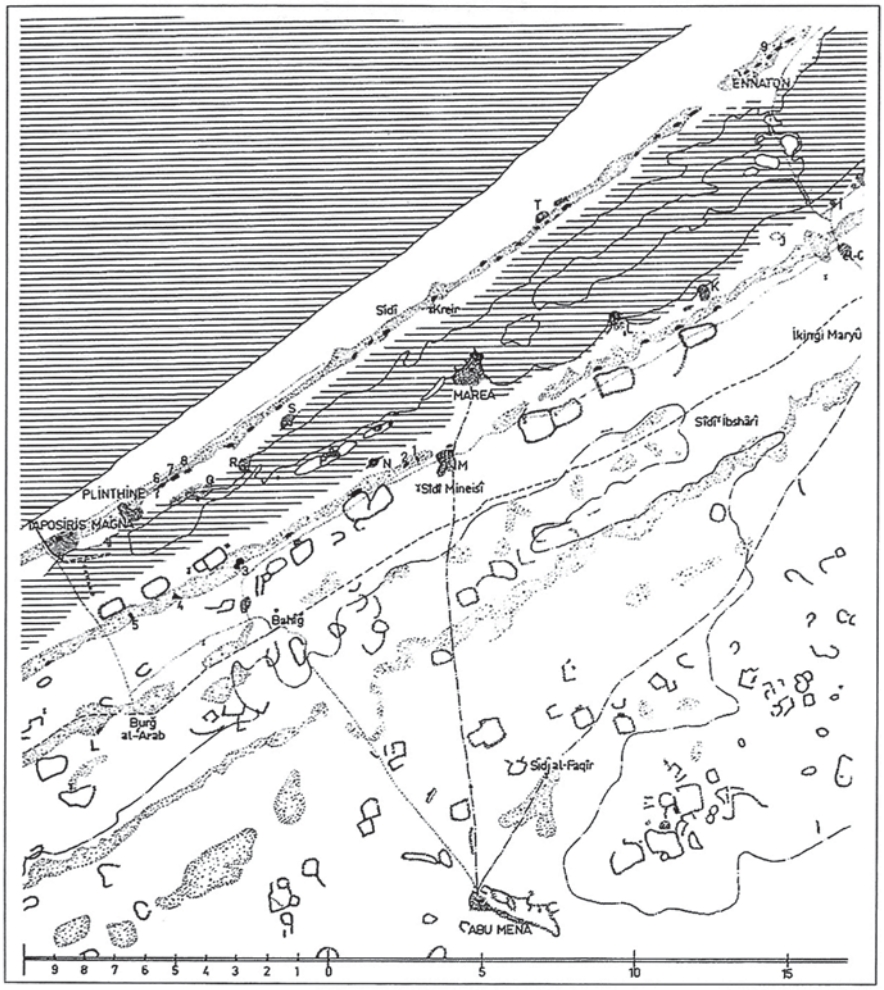


Fig. 9. The map of the region by Wolfgang Müller-Wiener, published on a scale of 1:200,000 (after Müller-Wiener 1967: Fig. 1)

Philoxenite, which will be discussed in the chapter concerning the town of Philoxenite and its place in the region [***Figs 9 and 10***]. This site, so far barely investigated, can be seen as a possible location of ancient Marea.

The maps presenting the area on a more detailed scale were not published until the 1970s. During the work conducted by the Alexandrian University, various buildings were unearthed (Haggag 2010: 53), when in the years 1977–1978, the site of "Marea" was a field of archaeological excavations directed by Fawzi el-Fakharani (Petruso and Gabel 1980: 23; el-Fakharani 1983: 175). In November and December 1976, a mapping of the site and a magnetometer survey, at the invitation of el Fakharani, had already been conducted by Mahmoud Sadek from the University of Guelph, Ontario. Sadek's map was published already in 1978, giving a rather distorted and geometricised image of the site (for a map by el-Fakharani from 1977, see Haggag 2010: 51; Sadek 1978; 1992) [***Fig. 11***].

From 1979, the Boston University's Summer Term and Study Abroad Program supported an archaeological field school at the site of "Marea". It took three consecutive seasons, one month

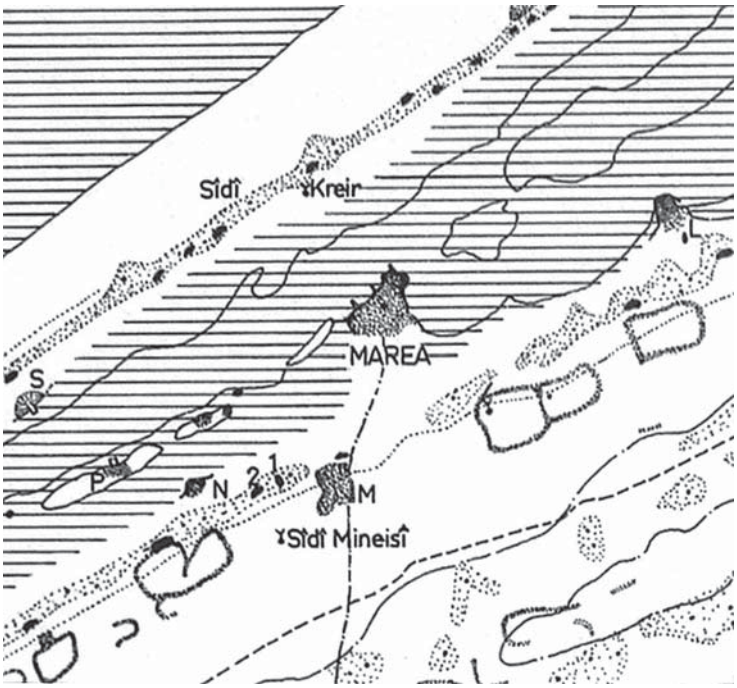


Fig. 10. Fragment of the previous map depicting the peninsula in focus, comparable in size to the settlement of Mit Abul Kom, here marked with a letter M (after Müller-Wiener 1967: Fig. 1)

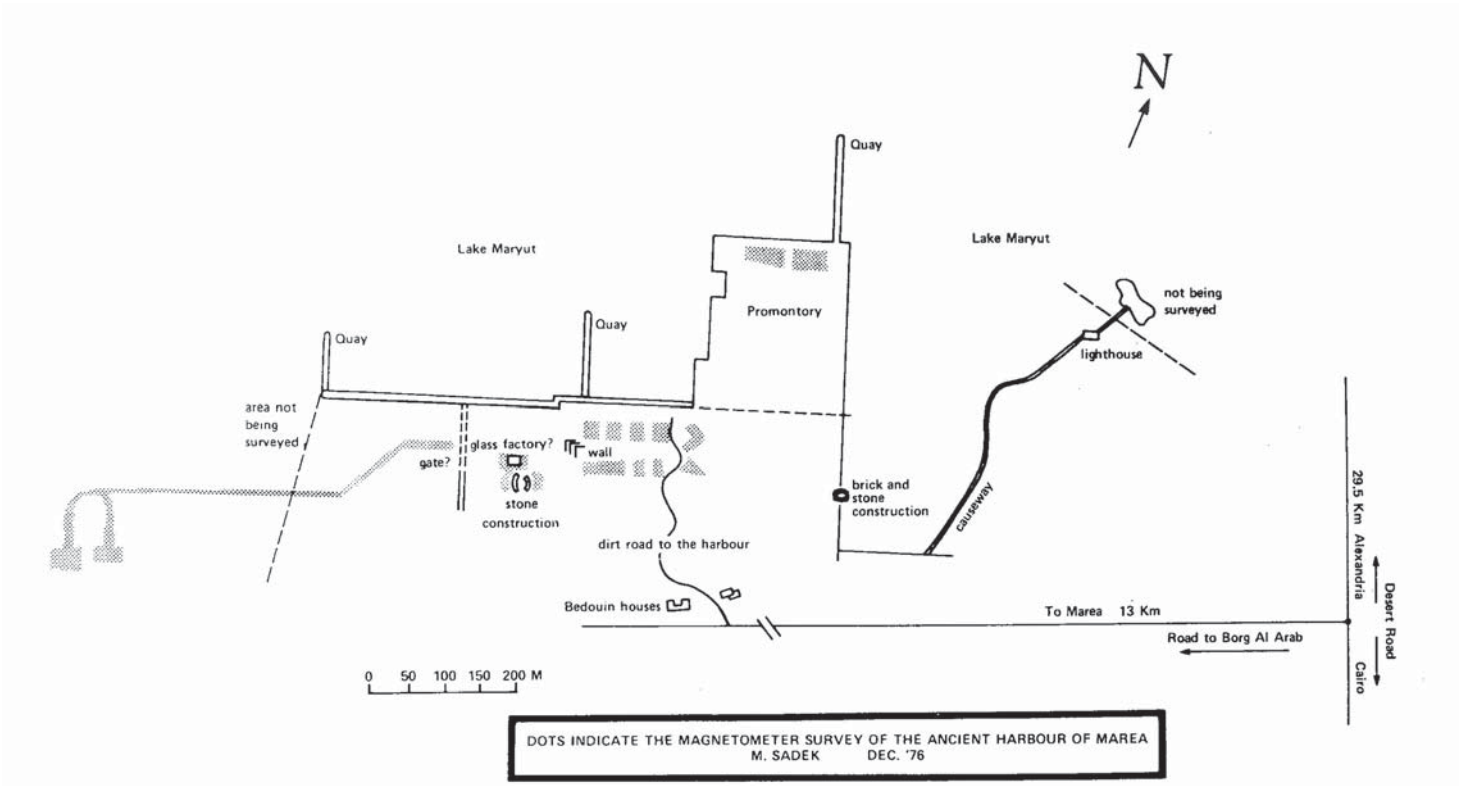


Fig. 11. Map of the site by Mahmoud Sadek from 1976 (after Sadek 1992: 553)

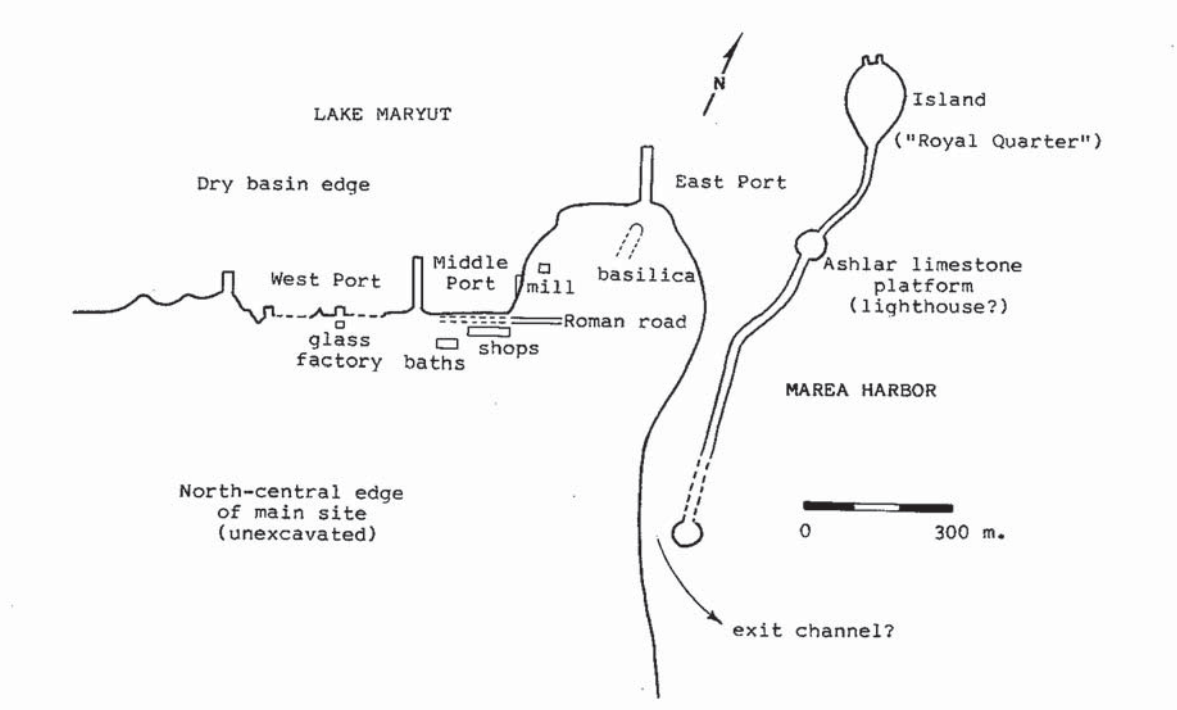


Fig. 12. Schematic map by Creighton Gabel and Karl Petruso of the northernmost part of the peninsula with a focus on the harbour facilities (after Petruso and Gabel 1980)

each year and was directed by Fawzi el Fakharani and Creighton Gabel in collaboration with Karl Petruso and architect Thomas Boyd from the University of Texas at Austin. The first sketch map of the site was published in 1980, giving only a schematic overview of the structures, including the great basilica, complex of baths,[7] shops and the basic topography of the site (Petruso and Gabel 1980) [***Fig. 12***]. A much more detailed plan was prepared by Thomas Boyd in the two seasons of field work 1980–1981on a scale of 1:500 and published in much reduced scale in 1982 (Petruso and Gabel 1982: Fig. 3) (see also Haggag 2010: 50–51) [***Fig. 13***]. Here, for the first time, the spatial relations in urban scale were documented. This plan remained unsurpassed in the rendering of the general urban stricture till the beginning of the survey presented here.

Chronologically, the next important contribution to recording the topography of the site is the extensive map published by Mieczysław Rodziewicz in 1998 (1998b: 95, 97). This map, though less detailed than the previous one, represented quite well the topographic features of the peninsula and the extent of the ruins, which were additionally set within the wider context of its vicinity with the variety of structures recognised in the radius of 2 km south of the peninsula. In addition, a bird's eye view of the location was presented. This map was reproduced in an article by the same author in 2003 (Rodziewicz 2003: 41, Fig. 3) with a minor change to the topography as a route to Abu Mena was added. The major change was, however, in the identification of the town: in 1998 it was named *Marea* but five years later labelled as *Philoxenité* [***Fig. 14***].

[7] It is noteworthy that the baths complex was properly identified in 1979, though designated as a church in 1983 (el-Fakharani 1983: 179).

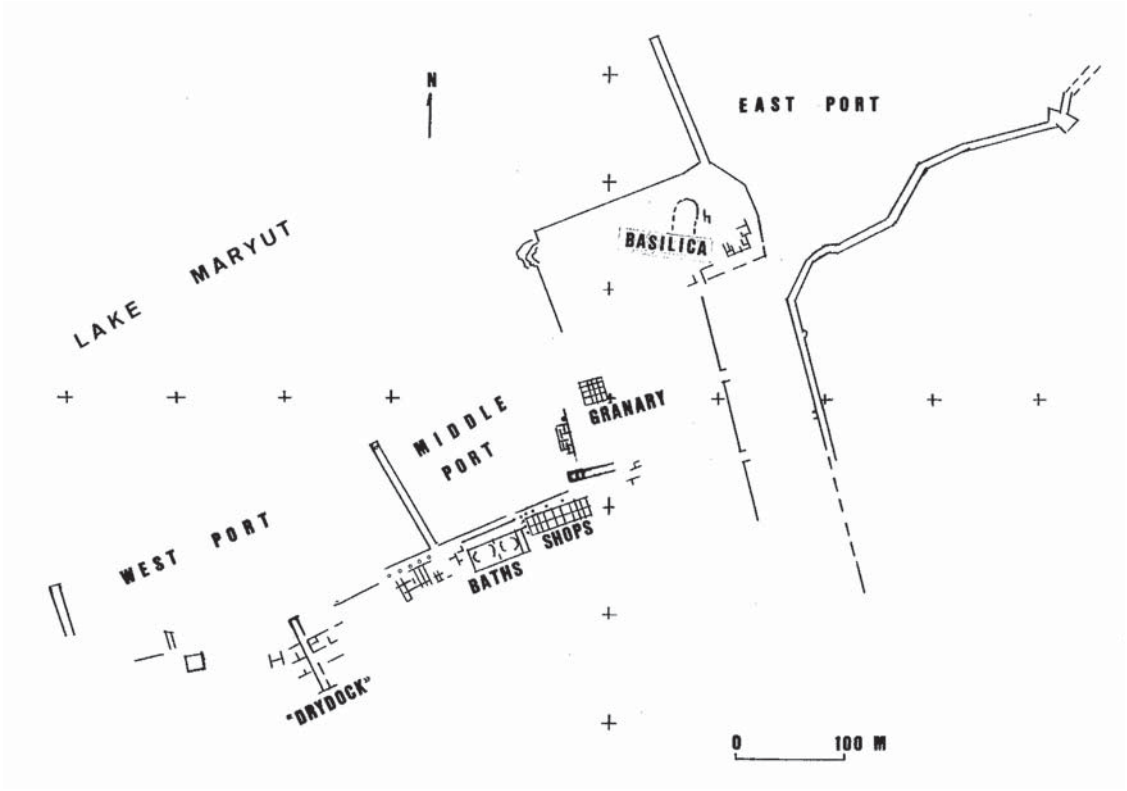


Fig. 13. This first map rendering building blocks on a scale of 1:500 by Thomas Boyd, then from University of Texas, Austin, as published on a reduced scale in 1982 (after Petruso and Gabel 1982: Fig. 2)

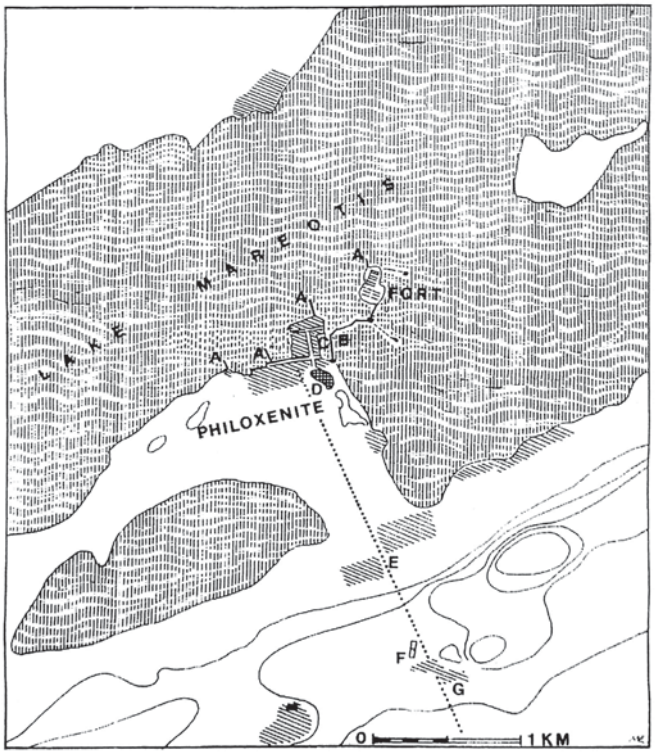


Fig. 14. Map of the site by Mieczysław Rodziewicz from 1998, here in its second redaction from 2003 (after Rodziewicz 2003: 41, Fig. 3)

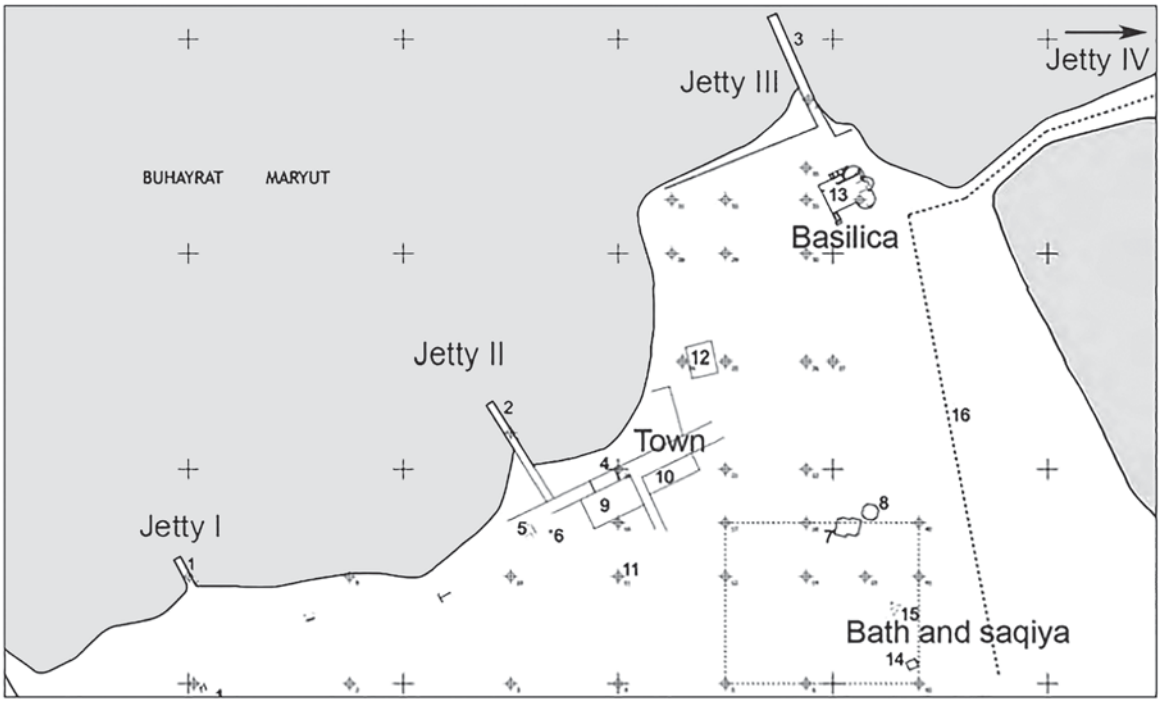


Fig. 15. Map of the site by Mieczysław Niepokólczycki with contribution from Artur Błaszczyk, created originally on a scale of 1:250, in 2008 (after Szymańska and Babraj [eds] 2008: Fig. 9)

In 2000, the excavations by the Polish Centre of Mediterranean Archaeology of Warsaw University and the Archaeological Museum in Kraków commenced, but the work concentrated on individual complexes. Topographic measurements of the site conducted on a scale of 1:250 by Mieczysław Niepokólczycki in November 2000 were published on much smaller scale in 2008 (Szymańska and Babraj [eds] 2008: 9, Fig. 9), when the map of the site was based on these measurements included contributions by Artur Błaszczyk, who visited the site in 2006 and illustrated the introductory part of the volume on the excavations in the seasons 2000–2003 and 2006. It was republished in 2010 (Babraj and Szymańska 2010: 76) [***Fig. 15***]. This map, however, incorporated fewer structures than the map by Mieczysław Rodziewicz published in the same volume of the International Conference on the Archaeology of the Mareotic Region in 2010, with until then the most extensive enumeration and proposed identification of different structures on the peninsula as well as a relatively accurate rendering of the ancient shoreline and its structures (Rodziewicz 2010: 71) [***Fig. 16***].

From 2003 the Centre d'études alexandrines was also working on the peninsula with a focus on the remains on the island connected with the mainland by an extensive stone causeway. The island was subjected to comprehensive study, which furnished much information about its topography and archaeological remains. A topographic survey was also undertaken on the main body of the peninsula by Cécile Shaalan, drawn by Isabelle Hairy and Valérie Pichot, and published in 2010, then republished in 2014 (Pichot 2010: 59; Pichot, Boussac, and Wuttmann 2014: 167) [***Fig. 17***]. The magnetic prospection conducted by Tomasz Herbich in 2004–2005 revealed

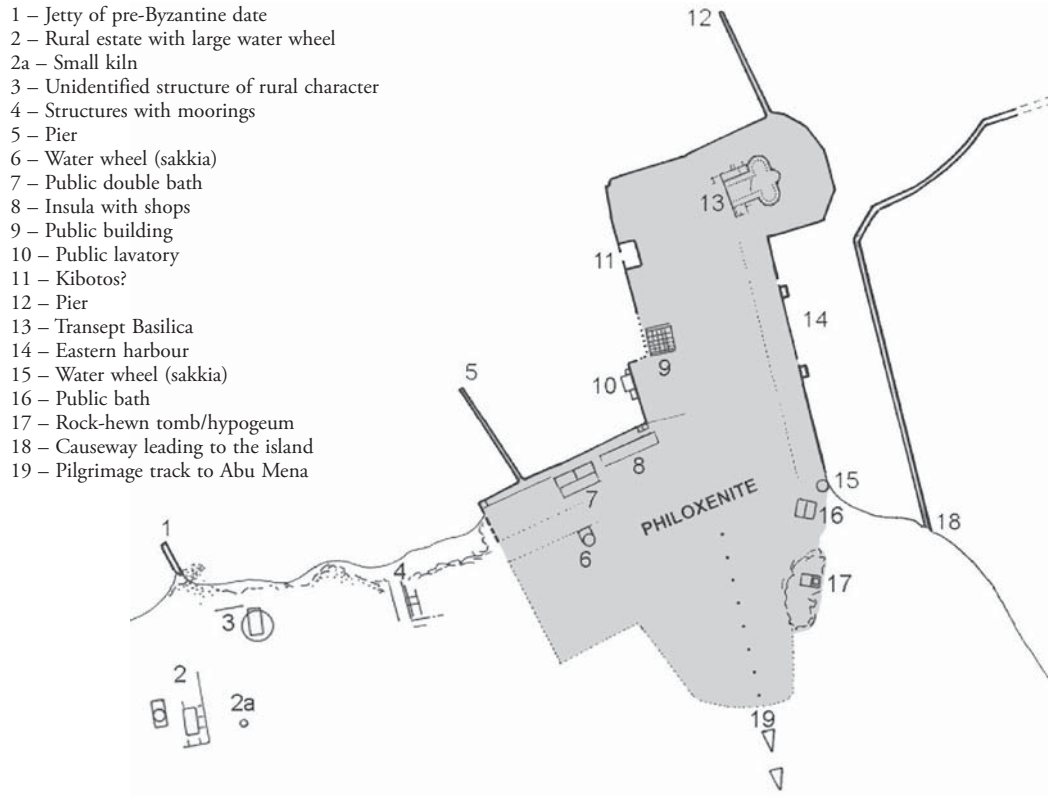


Fig. 16. Map of the site by Mieczysław Rodziewicz from 2010 (after Rodziewicz 2010: 71)

structures invisible on the surface of the island. Further archaeological investigation of the island uncovered them as remains of structures from Ptolemaic and Roman periods (Pichot 2010: 66).

The western arm of the peninsula, west from the Borg el Arab Airport—North Coast Road was included in the Lake Mareotis Research Project. Its three main survey seasons took place in 2007 and 2008.[8] The survey allowed identification and mapping of the structures at the lakeshore and on the hill in the central part of the arm of the peninsula, but the very western cape remained undescribed (Blue, Khalil, and Trakadas 2011: 113–118) [***Fig. 18***].

Several other maps of the peninsula should be also mentioned, such as that by Valérie Atef, published in 2010 on a scale of 1:9,000, presenting a general overview of the structures known since excavations by Fawzi el-Fakharani (Haggag 2010: 50 but also 48). However, the first attempt to place the buildings within their urban context on a more detailed scale were undertaken by Jacek Kościuk, who was invited to the site by Krzysztof Babraj in 2011. These efforts concentrated on the areas adjoining the eastern part of basilica and the plans were also a base for metrological studies. The plans were published in 2012, varying in the detailing of scale from 1:100 to

[8] Blue 2010: 25; Blue, Khalil, and Trakadas 2011: 29. The project was realised in collaboration between the Centre for Maritime Archaeology at the University of Southampton and the Department of Underwater Antiquities of the Supreme Council of Antiquities. During the five seasons (in 2004 the pilot survey took place, and between autumn 2006 and summer 2008 further four seasons were organised) the coast of the lake west from the modern road crossing the peninsula of Philoxenite was surveyed.



Fig. 17. Map by Valérie Pichot, which presents the outcome of a survey conducted under the auspices of the Centre d'études alexandrines (after Pichot 2014: 137, reproduced with kind permission of Valérie Pichot)

1:500; in the same paper a satellite image of the northern part of the peninsula with labelling of few structures of the site was also presented (Kościuk 2012: 30–31).

The surrounding area was surveyed several times, by Wolfgang Müller-Wiener in the 1960s, by the Lake Mareotis Research Project in 2000s, and currently, in a more detailed way by the Centre d'études alexandrines, whose completed outcomes are yet to be published (Pichot 2009; 2010; 2012; Nenna 2015; Pichot 2017; Nenna 2018; Nenna et al. 2020a; 2020b; Nenna and Pichot 2021; Awad 2023; Pichot and Simony 2023). Archaeological work was undertaken at several sites between the peninsula and Abu Mena, as well as on the lakeshore. These surveys allowed documentation of at least some of the elements of the landscape of the 6th and 7th centuries BC, which included numerous wineries.[9] These surveys and research have contributed to better understanding of the region of the site and provided source material for depiction of "Marea"/Philoxenite in a wider context.

[9] Apart from the work concerning Abu Mena as the most important the following should be enumerated: el-Fakharani 1983; Rodziewicz 1988; 1991; Abdel Aziz Negm 1993; Grossmann and Khorshid 1994; Rodziewicz 1995; Abdel Aziz Negm 1998; Abdel Aziz Negm and Empereur 1998; el-Ashmawi 1998; Empereur and Picon 1998; Grossmann and Khorshid 1998; Rodziewicz 1998a; 1998b; Abdal Fatah and Grossmann 2000; Grossmann 2002; Rodziewicz 2002; Grossmann 2003; 2007; Grossmann and Kościuk 2007; Solieman 2007; Grossmann 2008; Abd el-Fattah et al. 2009; Grossmann, Abdal Fatah, and Bolman 2009; Dzierzbicka 2010; Pichot 2014; Pichot and Şenol 2014; Grossmann 2019.

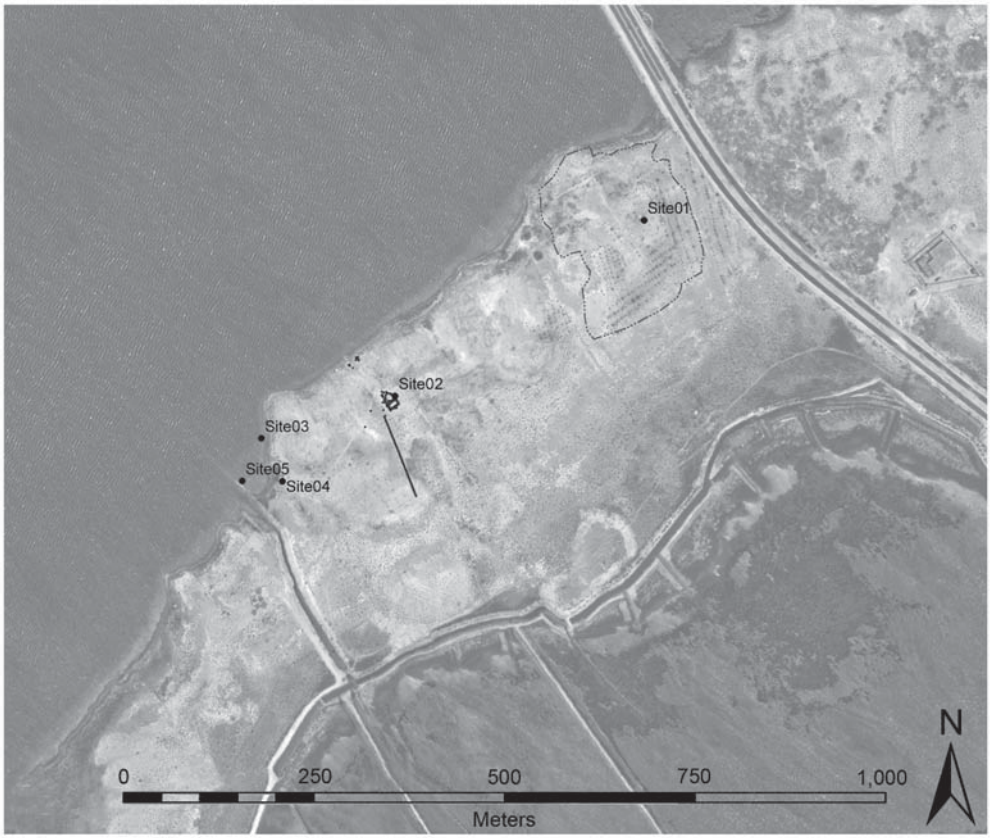


Fig. 18. The only existing attempt to map the western part of the peninsula, which was part of The Lake Mareotis Research Project, led by Lucy K. Blue and Emad Khalil (after Blue, Khalil, and Trakadas 2011: 114, reproduced with kind permission of Lucy K. Blue)

Objectives and progress of the survey in the years 2018–2021

The main objective of our survey was to collect data required to compile a general plan of the area of the settlement and its vicinity. The main targets of the planned mapping work were completed during seasons 2018–2020. During the first season, the survey was concentrated primarily in the northern part of the site, at the promontory stretching approximately 220 m northwest from the main body of the peninsula, in the area between the great basilica and the eastern baths. The second season of the survey, in 2019, with the support of the magnetic prospection of the northern part of the site, enabled the mapping of the promontory, as well as the eastern part of the settlement, including the necropolis hill. The measurements taken in 2019 also allowed incorporation of the existing surveys of the basilica (B1), the eastern thermal complex (T1, SQ1) and a burial chapel (CH1) into the general plan of the site. These three surveys were the result of the documentation work by Daria Tarara, which commenced in 2000.[10] During the 2019 season, it

[10] The plans of the baths and the burial chapel was published in Szymańska and Babraj (eds) 2008, and the plan of the great basilica and the old basilica in Babraj, Drzymuchowska, and Tarara 2020. The plans published by Jacek Kościuk of the buildings east of the basilica were also partly incorporated into the main plan (see Kościuk 2012).

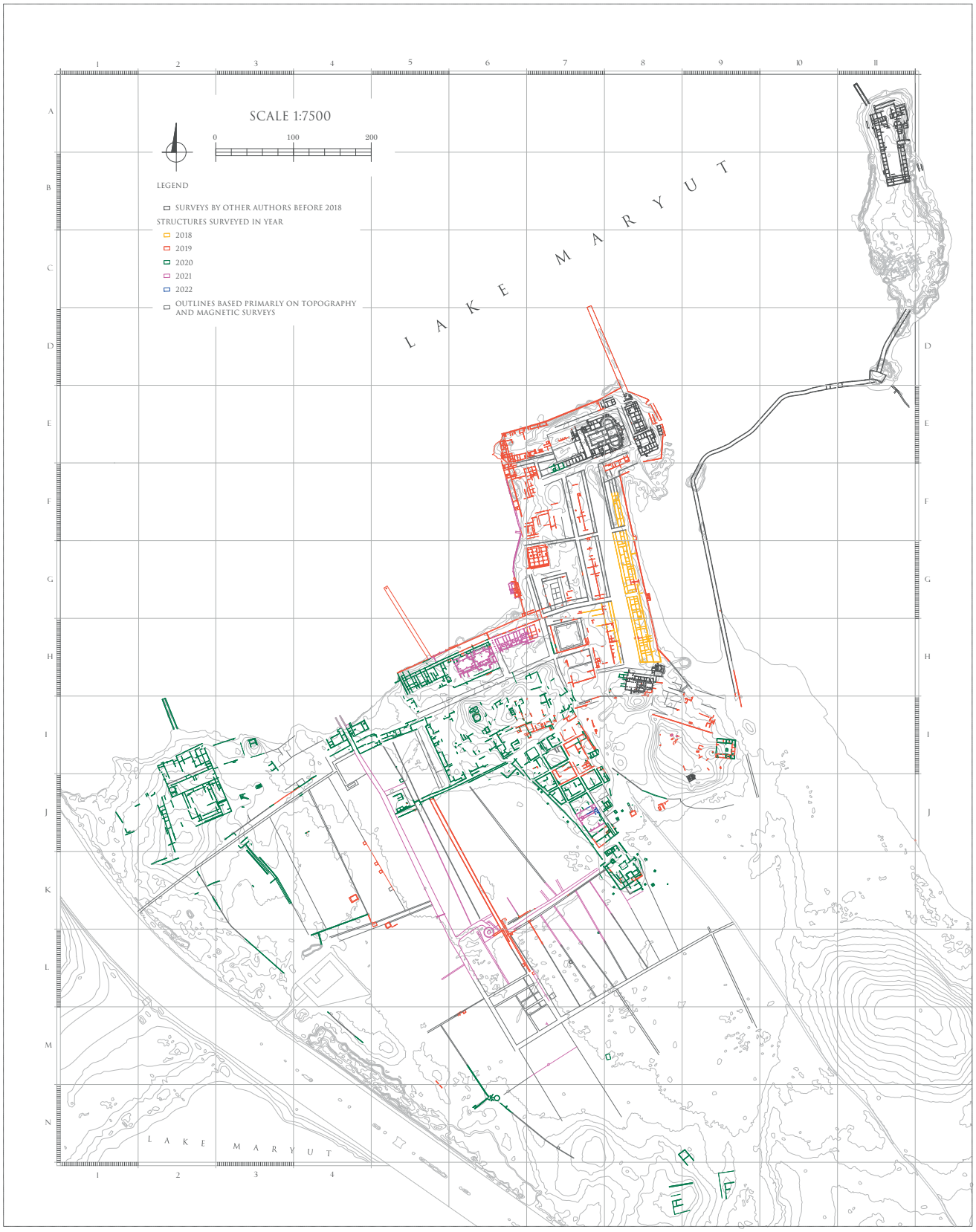


Fig. 19. Survey progress between the years 2018–2022 (drawing A.B. Kutiak)

was also possible to identify the main outlines of the irrigation system on the southern part of the site, as well as to start work in the southern part of the urban settlement, especially in its southernmost district. The latter became the starting point of the survey in the 2020 season, when the southern, central, and western parts of the site underwent the extensive mapping. This season was the most comprehensive in terms of the extent of the surveyed area [***Fig. 19***].

The survey in 2021 was focused on mapping those remains on the site which earlier were out of reach, as they had not been revealed during excavation works or had been inaccessible in the previous seasons because of the higher water level. However, the work contributed significantly to understanding the main characteristics of the urban structure and to mapping its agricultural vicinity. The survey was supported by the magnetic prospections coordinated with the direct outcomes of the mapping of the structures visible on the surface.[11] For that season, a more detailed survey of the western baths (T2) was scheduled as the assessment of the already functioning in literature plan of baths and the adjacent buildings had revealed the need for their reassessment before incorporating them into the general map of the site (Sadek 1978; Petruso and Gabel 1982; el-Fakharani 1983: 179–180; Sadek 1992: 554; Fournet, Redon, and Vanpeene 2017: 485–486). The more than 0.5 m fall of the lake water table in comparison to previous seasons also allowed the tracing of earlier unnoticed lakeshore structures. The excavation accomplished on the necropolis hill and in Area N1 revealed further structures, which were supplementarily surveyed and incorporated in the main plan. Thus, the survey of the area could be considered as thorough, understood as mapping of structures visible on the surface and those already archaeologically investigated up to the year 2022. The outcome outstripped initial aspirations, as the area assumed to bear any remains of built structures had been initially estimated to be about 15 ha and at the final stage the general map of the site covered approximately 50 ha; the area of urban settlement alone can be estimated to be approximately 11 ha [***Maps 1 and 2***]. The overview of documentation progress during each season is presented in ***Fig. 19***.

Methodology

The methodology for the survey was adapted to the character of the site and to the preservation state of the building structures; in most of the area, the remains of the walls made of ashlar stones were visible on the surface without any archaeological intervention. Some copings were covered with loose silt not deeper than a 10–15 cm, which in many cases could only be uncovered with a brush. Given these circumstances, the basic outlines of the buildings, in many cases on a room unit scale, were detectable without any extensive archaeological interventions. To this main body of surveyed remains can be counted also the structures revealed in the previous archaeological works from the 1970s onwards, as they have usually remained exposed. They are relatively well-preserved, with walls in certain areas reaching a height of approximately 2 m, which allows detailed architectural documentation, but their direct urban contexts in most cases have remained unclear until recently. The urban and architectural outlines are more difficult to obtain in the areas where the majority of buildings were constructed from rubblework, if they were not at least

[11] The magnetic prospection in the 2021 season was conducted by Tomasz Herbich.

partly excavated—this building technique does not allow tracking the extent of the buildings in the same degree as the ashlar walls.

This described state of preservation of the remains allowed the application of a survey method yielding possible precise rendering of the built structures. To obtain the scale of accuracy of 1:200, the field documentation was executed on a scale of 1:100, as a manual drawing supported by tachymetric measurements, with the total station in the same coordinate system during all seasons since 2018.[12] For the sake of efficiency, the tachymetric measurements rendered only the most important and characteristic points of the structures. These points were plotted in overlapping, A4 paper sheets as a base for the manual drawing, supported with additional measurements conducted on the spot. This method not only allowed a staggering of the survey and precise rendering but also a double check of the measurements taken. As mentioned above, in some cases the existing plans, if of sufficient quality, were incorporated into the master plan.

The structures visible on the surface made it possible to render the general grid of the urban fabric. Its axes and extent could be identified for a major part of the site, and as such are to be treated as the fundament of the general plan of the site. In some cases, however, they were supplemented with indirect knowledge of structures which were invisible on the surface. This was possible with the aid of the magnetic prospection as well as the digital terrain model. These were provided in the 2018 season by Krzysztof Misiewicz and Wiesław Małkowski.[13] When combined with the tachymetric measurements of the visible, it was possible to gain a better overview of the whole site, especially in the areas dominated by rubblework structures and on the borders with the agricultural area, where the contrasts in the magnetic map were most prominent; also within the urban area it was especially helpful in following the general structure of the urban fabric. As for the area behind the southern limits of the magnetic prospection, the satellite image also provided clues which allowed placing the structures, and their better understanding in relation to the neighbouring structures, within a wider context. This became clear in the 2021 and 2022 seasons thanks to the geomagnetic prospections of Tomasz Herbich.[14]

Satellite images, the magnetic survey, and prospection on foot revealed that the areas of the site which were not taken under consideration earlier, bear significant number of structures, especially those connected with agriculture and water management. The earlier studies had been focused on the northern, built-up area of the peninsula, and the central and southern areas were not incorporated to the older plans of the site. Thanks to the later more detailed prospection, it was revealed that they have important value for the understanding the context of the town in its economic, agricultural, and urban planning aspects and yield much more information about the landscape of the major part of the whole peninsula. Every detected structure from in the range of the general map of the site [***Map 2***] was incorporated to the plan, though the plotting of those structures as presented here is far from being completed. The scheduled gradual extension of the magnetic will further contribute to the knowledge of the extent and character of the hydrological system and therefore to the correlation of urban and rural aspects of Mareotis in the late Roman period.

[12] EPSG 32635, total stations Leica TCR407 Power and Leica TS04.

[13] The magnetic survey was assisted by Tomasz Groszek. It covered the area of the peninsula north from the 3431300 parallel in EPSG 32635, see also Derda et al. 2021.

[14] In the latter season assisted by Konrad Jurkowski.

These different sources of information and the heterogeneous topography of the area in antiquity are reflected in the graphics of the presented general map. The visible and undisputed elements of the structures are shown in continuous bold line, the dashed line being reserved for the presumable but to some extent still hypothetical structures. The shades of grey were used for the topographical elements, such as the terrain relief, shoreline and also for those structures which are most defining for the landscape of the peninsula in its current state, such as the highway and the storage museum. The shoreline serves as an approximation, in the current state of the fluctuating water table of the lake: since 2010 the water level has been gradually rising, with a significant fall off between seasons 2020 and 2021. The traces of the irrigation system and divisions of the urban blocks based on the magnetic survey, satellite image or the topography were depicted in dotted line. The general plan [***Map 2***] on a scale of 1:3,000 covers an A2 sheet, but every part of it can be used for further studies and detailing in the abovementioned larger scales of up to 1:200. Although the focus of the survey was the northeastern part of the peninsula, the peninsula as a whole should be considered as an archaeological site of interest.

The map of the region of Philoxenite, Taposiris Magna, and Abu Mena on a scale of 1:60,000 in format A2 [***Map 1***], also requires a short explanation. It should be treated as an assemblage of different maps and plans of structures and settlements chronologically relevant to Philoxenite. The main sources for the topography of the area were the maps of the Survey of Egypt in both mentioned editions from the first half of the 20th century as well as the newest satellite images combined with knowledge of the region gained during multiple prospections.[15] These were supplemented with the data scattered through the literature, especially in terms of location of the sites which have been already excavated. It cannot be treated as a complete map of Mareotis region in the late Roman period but rather as an assembly of detected archaeological remains which are archaeologically relevant to that time.

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[15] Exhaustive compilation of the archaeologically relevant topographical features from the surveys of Egypt offers *Carte archéologique de la Maréotide*, see Nenna 2018, which was also a support for map no. 1. Special thanks also to Anna-Katharina Rieger for her input to the map.

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Chapter Six

AN URBAN SETTLEMENT AT LAKE MAREOTIS*

Andrzej Bruno Kutiak

Introduction

This chapter introduces an urban settlement on a peninsula at Lake Mariout in its current state of preservation, spatial disposition, the outline of its urban characteristics and discusses its intermediate topographical context.[1] The vicinity of the town—setting aside the discussion of whether we are dealing here with a *bourgade*[2] or a small city—within the topographical features and functional complexity of the settlement web will allow also us to define the role of this place in the wider context of the Mareotis region more comprehensively and to shed light on its development.

The outcome is based on the dating of archaeological evidence as established by specialists, combined with analysis of built structures both in their material and archaeological aspects but also their formal, geometrical features. The description and analyses are founded solely on material/archaeological evidence, but several further aspects, supported by the written sources, will be also incorporated.[3] The focus of this study is urban and architectural planning, but certain architectural details, where relevant for the process of deduction, will be also mentioned. The technical aspects of the constructions will be discussed whenever they are of significance for the dating or geometrical specifics of the given structure.

Within this framework, this chapter is as an attempt to describe the settlement in as much detail as possible in the current state of its exploration, to unveil its internal chronology with geometric and metrological analyses, and, in the analytical domain, to focus on the formal aspects. Underpinning this is a functional analysis, to the extent that the current state of exploration of this site after the 2022 season allows. It is hoped it will contribute to the urban studies of Late Antiquity as an exceptional example of an urban settlement within the Greek-speaking world, situated in the vicinity of the city of Alexandria and nestling in a lacustrine landscape with a link to the one of the most important pilgrimage centres of its time.

* Work on this chapter was completed in late spring 2023. For various reasons, the production of this book was delayed until spring 2025; in the meantime, the participants in the Philoxenite project published two articles closely related to the content of this chapter: Gwiazda, Kotarba-Morley, and Derda 2024 as well as Zalat et al. 2025. In particular, the first of these papers, in its descriptive layer, follows the trail of the topographical description of the site, fully presented only here.

[1] My first encounter with this archaeological site took place in 2010. As a student of architecture at the time, I took part in the last season of archaeological excavations led by late Hanna Szymańska. In the seasons 2014 and 2016, I conducted the architectural survey for Dagmara Wielgosz-Rondolino in the area east of the great basilica. However, the study emerged thanks Tomasz Derda, who in 2018 entrusted me with the area of the site almost as a *tabula rasa*; it was about to be filled with the picture of a forgotten landscape. The outcomes of this collaboration during four seasons of fieldwork and mutual inspiration can be now presented in the following contribution.

[2] Philoxenite, as well as Abu Mena was qualified by Luke Lavan as a *bourgade* (Lavan 2020: 30), a settlement form between a city and a village, which could have been regularly planned or of irregular character.

[3] For deeper analysis of written sources concerning this site, see chapters 1 and 3 in this volume.

When it comes to terminology, the Greek and Latin terms for the specific elements of urban infrastructure without direct modern equivalents will be preferred, as befits a settlement functioning in a Grecophone world; in other cases, the modern names will be used.[4] As has already been elucidated in the introductory chapter by Tomasz Derda, the main urban settlement, dating from the second half of the 6th century AD, will be referred to as Philoxenite. The reader will also find references to the detailed archaeological investigation of each trench within the next forthcoming volume.

In the present chapter, double numeration of the structures is used. The codes for the main complexes are usually letter-numbers, for example, V1, SQ1. They were created during recent years of archaeological survey and were used in previous papers concerning the site. The parallel numeration, ranging from 1–131, was created for reference to structures of the site as depicted in the maps of each district illustrating this chapter.

The contexts of the site

Geological and environmental situation

In its current state of hydrological situation [***Fig. 1***], the site is located on an L-shaped peninsula at Lake Mariout, which stretches almost exactly 1.5 km from the southern lakeshore northwards, its longer arm extending parallel to the lakeshore for 1.4 km. At the northeastern corner of the peninsula, approximately 340 m from its shore, there is an island of 125 m × 290 m, which is presumed to have been connected by a causeway with the peninsula since the Roman period (1st–3rd century AD) [***Fig. 2***].[5] This islet is only one in a sequence of islands located roughly in the middle of the lake. The shortest distance between the northern shore of the peninsula and the northern lakeshore is a few meters less than 1.5 km at water level as of 2020. The relief of the peninsula is diverse: the first 600 m at its base is hilly, reaching approximately 10 m above the lake level at its highest points. The land descends and flattens in the central part of the peninsula, becoming hillier again in the northern and western directions, where the parent rock is exposed in several places [***Figs 3–6***].

As a result of the parent rock formation, the topography can be seen as unchanged from the Roman times in its main outlines, especially in the southern and western part of the peninsula. Terrain relief and the shoreline of the northernmost part of peninsula was at some point remodelled by the settlement itself,[6] which will be discussed in more detail below.

Perhaps the most drastic intervention and change to the topography of the area was the construction of the highway Borg el-Arab Airport – North Coast Road, which runs through the longer western arm, and was constructed in the second half of the 20th century [see ***Fig. 3***, see also Chapter 5, ***Fig. 18***]. In 2010, a new canal at the southern base of the peninsula was built, virtually cutting the peninsula off from the mainland.

The vegetation in the vicinity of the lake is strongly bound to the hydrological situation of the region, which, being of a complicated nature, has been thematised by several authors in the past

[4] Which follows the rule taken by Lavan 2020: 6.
[5] Pichot 2010: 58; 2012: 98. However, no exact stratigraphy of this structure has been published.
[6] See also Gwiazda, Kotarba-Morley, and Derda 2024.

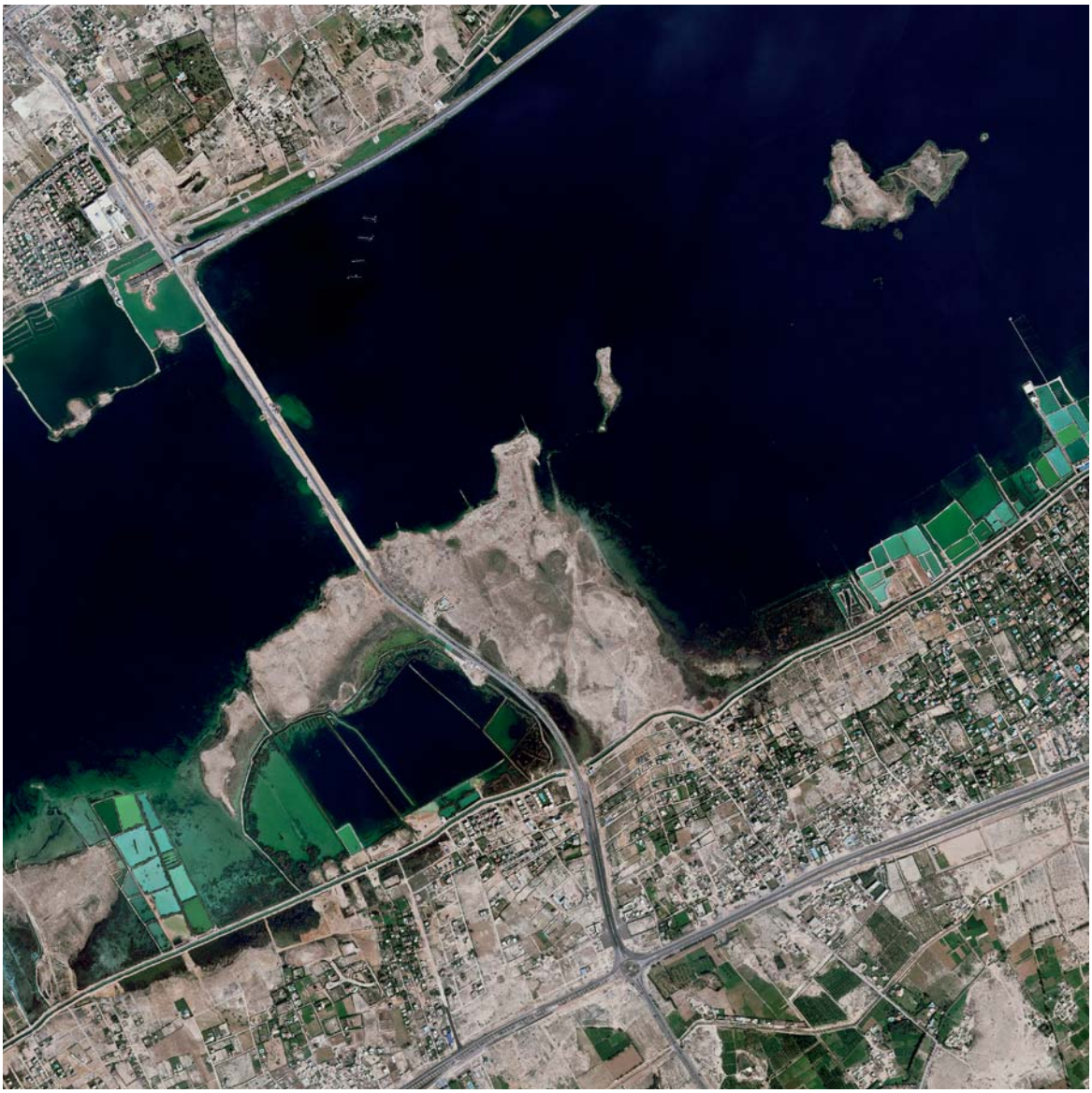


Fig. 1. Satellite image of the peninsula and adjacent region (GoogleMaps, 2023)

few decades.[7] Based on the collected evidence, both archaeological and geological, we can conclude that the water level of the lake has not been stable over the last two millennia (e.g. Gwiazda, Kotarba-Morley, and Derda 2024; Zalat et al. 2025). During the Hellenistic and early Roman period, the lake water table was assessed as being significantly lower than the mean sea level and

[7] Among the most important studies can be counted: Warne and Stanley 1993; Mycielska-Dowgiałło and Woronko 2008; Pichot 2009; Awad 2010a; 2010b; Blue 2010; el-Abbadi 2010; Flaux 2011; Khalil and Blue 2011; Flaux 2012; Flaux et al. 2012; Pichot 2012; Woronko 2012; Pichot 2016; Flaux et al. 2017; Shaalan et al. 2018; Nenna et al. 2020a; Flaux et al. 2021, but the most significant latest contribution is the study by Maël Crépy and Marie-Françoise Boussac (2021) and those in preparation under auspices of Centre d'études alexandrines (Pichot 2017; Awad 2023; Pichot and Simony 2023).



Fig. 2. The nearby island with remains of a Hellenistic settlement, connected by a causeway with the peninsula. Note the dense reed thickets characteristic of the shores of the lake. View from the south (photo A.B. Kutiak 2021)

therefore lower than at the beginning of the 2020s (Crépy and Boussac 2021).[8] This is also attested in the neighbouring archaeological site, 300 m eastwards from the base of the peninsula, which was surveyed by the Centre d'études alexandrines mission and is known by the name "Akadémia".[9] In Roman times, it was a place of intensive amphora production; it was later (in Philoxenite times) an agricultural area—in the intermediate period the water table rose by at up to 1.5 m between the 2nd and 5th centuries AD (Flaux et al. 2021: 100–101) and this lasted approximately until the 7th century AD (Crépy and Boussac 2021: 49; Flaux et al. 2021: 97–100). The exact extent of the fluctuations of the water table remains, however, disputable, as it might also be dependent on the seasonal floods. In the 6th–8th centuries, the water table at the highest tide must have been similar to that noted in 2021 (approximately 2.8 m above MSL in 1906) judging by the functional aspects of the lakeshore structures, i.a. the height of piers and functional levels lakeside latrines, stairs and artificial bays (see Gwiazda, Kotarba-Morley, and Derda 2024).

[8] Because of the hydrological situation, the western branch of the Lake Mariout should be reconstructed as a complex of several smaller lakes, partly connected near Taposiris Magna, with canals allowing waterflow from the eastern basin to the western ones. So, the described area would not have been such a strongly pronounced peninsula (Crépy and Boussac 2021: Fig. 7). The canal that cut off the westernmost cape of 390 m length from the main body of the peninsula might have been dated to Hellenistic to early Roman period (Crépy and Boussac 2021: Fig. 6). Another one of the recognised canals, according to the paper, was located in the proximity of the northern shore of the peninsula. This would also explain localisation and possible dating of the rectangular structure noticed by Gratien Le Père (1829); see Chapter 5.

[9] The name does not refer to the archaeological features of the site (Pichot and Şenol 2014; Nenna 2015; Pichot 2016; Nenna et al. 2020b: 22–35; Nenna et al. 2021: 22–39; Nenna and Pichot 2021).



Fig. 3. General view of the site from the southwest; the Borg el-Arab Airport – North Coast Road in the foreground (photo A.B. Kutiak 2019)



Fig. 4. General view of the western arm of the peninsula, as seen from the south, from the standpoint of the Borg el-Arab Airport – North Coast Road (photo A.B. Kutiak 2019)



Fig. 5. The northern shore of the peninsula as seen from District L, facing the northeast with the prevalent area of Philoxenite in view (photo A.B. Kutiak 2018)

The influx of the freshwater to the lake was supported in Roman times by the several canals from the Nile and rainfall.[10] As a consequence, the water of Lake Mariout was fresh, based on the ostracod and diatom species evidence sampled from drillings. This freshwater basin also supported vegetation different from that of the current brackish basin. This is attested by the vivid description by Strabo[11]—still from the early Roman period, alas before the documented high tide of the lake—and by the well-founded assumption that the landscape of Lake Mariout was this place, which is represented on the so called "nilotic mosaics" or at least was the main inspiration for them (Rodziewicz 2002; Pichot 2012: 98; Nenna et al. 2020a: 9–19). Thus, the direct context of the settlement, except for its physical properties, understood as a natural environment surrounding the town, should be understood as more diverse than known in its present state. Further archaeological remains, which will be described in this chapter, indicate that the lake, as a freshwater basin supported more than lakeshore vegetation. Salination, the fall of water table and

[10] Strabo (*Geographica* XVII I 14) mentions canals connecting the lake with the Nile, see Stanley and Jorstad 2006; Flaux 2011; 2012; Flaux et al. 2012; 2017; and especially 2021: 94, 101.

[11] Strabo, in Section 14 of Book XVII, describes Lake Mareotis, and in the following Section 15, he presents a longer description of a plant, which he calls *cyamus*: "But whereas the byblus is a bare stock with a tuft on top, the cyamus produces leaves and flowers in many parts, and also a fruit like our cyamus, differing only in size and taste. Accordingly, the bean-fields afford a pleasing sight, and also enjoyment to those who wish to hold feasts therein. They hold feasts in cabin-boats, in which they enter the thick of the cyami and the shade of the leaves; for the leaves are so very large that they are used both for drinking-cups and for bowls, for these even have a kind of concavity suited to this purpose", translation by H.L. Jones. The *cyamus* can be interpreted as the exclusively freshwater *Nelumbo nucifera* Gaertn, see Prigioniero et al. 2020: 65–66. It survived also (and not only?) as an ornamental motif in the Byzantine period wall painting of the region, see Rodziewicz 2002: 5, Fig. 9.



Fig. 6. Panoramic view of the site from the necropolis hill (photo A.B. Kutiak 2022)

eventually desertification of the lake between the 9th–12th centuries AD is attested by the geological surveys and the historical documents, and could be seen as a one of the factors behind the collapse of the human settlement in this region at the beginning of medieval times (Rodziewicz 2002: 9; Flaux 2011; 2012; Flaux et al. 2017: 678–680; 2021: 102; Gwiazda 2023b).

Area between Philoxenite, Abu Mena, and Taposiris Magna

The mapping of the web of settlements around the site owes much to the abovementioned publication by Wolfgang Müller-Wiener discussed in Chapter 5 of this volume, but since then many more remains have been excavated or noticed in the region (Müller-Wiener 1967; Rodziewicz 2010 and the abovementioned Centre d'études alexandrines surveys). To gain a clearer perspective on the urban and architectural aspects of the site, a short overview of the primary context of the settlement network outside the peninsula in their timeframe of Late Antiquity is required. These are graphically presented in Map 1.

The site is located approximately 36 km southwest of Alexandria city centre and can be reached on foot from that city in less than nine hours.[12] From the site to the shrine of St Menas (which will be important for further analysis) is approximately 16 km as the crow flies, but on foot the sanctuary can be reached in somewhat less than five hours by the most convenient path. The nearest larger settlement was Taposiris Magna (Abū Sīr today), also connected by a causeway to the southern shore of the lake. It is situated at a distance of approximately 14 km measured along the lakeshore and could be reached in less than four hours' walk.[13] Apart from Taposiris, one more urban site in the vicinity is noteworthy. There are remains of a settlement covering an area of at least 20 ha. They are located approximately 2 km south of the southern extremities of Philoxenite and less than 1.4 km from the base of the peninsula, so could have been reached in less than

[12] I would like to express my thanks to Przemysław Piwowarczyk for discussion on this subject; see Chapter 1 by Ewa Wipszycka in this volume for more exact calculations.

[13] For more about Taposiris and its role in the hydrological system of western Lake Mariout, see Crépy and Boussac 2021.

a half-hour walk from Philoxenite. This site appears in the literature under the name of Mit Abul Kom (Haggag 2010: 53; Fournet, Redon, and Vanpeene 2017: 494–495). In the current state of road infrastructure, it is located directly southwest of the roundabout at the crossroads of Cairo – Borg el-Arab Desert Road and Borg el-Arab Airport – North Coast Road. The remains of this settlement are at least as extensive as those located on the peninsula and were also serviced i.a. with baths. This area was partly excavated in the last quarter of the 20th century, but no extensive study has ever been published. The directions of the walls visible in different parts of the site allow us to hypothesise that it was an urban settlement that was at least partly regularly planned. It was inhabited contemporaneously with Philoxenite, though it might be older, and was occupied at least into the Fatimid period, as attested by pottery evidence and architectural elements visible on the surface. These two settlements: Taposiris Magna and the town of Mit Abul Kom, whose original identity is unknown, together with Abu Mena, seem to have formed the main urban centres in a radius of 16 km from Philoxenite.

The abovementioned island, neighbouring the peninsula from the northeast, connected with the promontory of the main body of the peninsula by a causeway, was especially intensively inhabited in the Hellenistic period, when its silhouette was dominated by the tower houses (Pichot 2014).[14] Later, during the 1st–2nd centuries AD, an extensive complex, *villa lacustris*, was constructed in the northern part of the island. The construction date of the causeway has been estimated to lie between the 1st and the 3rd century AD, so it must have remained connected in this artificial way to the main body of the peninsula at least since then (Pichot 2010: 58; 2012: 98). However, the island was not an important centre of habitation in the Byzantine period. This long causeway was not an exception in the region; even longer causeways and jetties existed in Taposiris Magna. As already mentioned, one of them connected the town to with the southern shore of the lake (Boussac and el-Amouri 2010; Crépy and Boussac 2021; see also Blue, Khalil, and Trakadas 2011: 291–292).

On the island west from the peninsula, further remains of settlements are known, and based on the pottery from this island, it was inhabited simultaneously with Philoxenite, as material from the 5th–7th century dominates, but was inhabited at least from Hellenistic period on. Among the most significant structures on this island is a harbour of *kibotos* type on the northern bank, where more remains of piers have been identified.[15]

Apart from the three main abovementioned urban settlements and both islands, in the vicinity of Philoxenite there are many scattered remains of built structures of various types, which are contemporaneous with the town or older than it. In the proximity of the site, within the peninsula, on the hill west from the Borg el-Arab Airport – North Coast Road, the Lake Mareotis Research Project has turned up pottery sherds, primarily from the 2nd–1st centuries BC, but with

[14] Considering the hydrological history of the lake, at that time it might have been a cape rather than an island.

[15] Blue, Khalil, and Trakadas 2011: 121–126, Site 09. Referred to as a "Pr-shaped harbour" in Haggag 2010: 47. Late Roman 1 and 4 are the best represented types of amphoras in the middle and in the northern part of the island. The oldest sherds recovered during the Lake Mareotis Research Project have not supported the hypothesis that the structures in the middle of this island should be interpreted as pharaonic Marea. The description by Mona Haggag of relicts of a supposedly pharaonic fort belong to the site 700 m west form the mentioned *kibotos* harbour (Blue, Khalil, and Trakadas 2011: 127–129, Site 13), on the lakeshore, not in the centre of the island, as the map suggests (Haggag 2010: 49, map 1 with marked "fortress"). It was also discussed in Petruso and Gabel 1982: 5–6. This structure stands out in its building technique, but there is lack of sufficient archaeological data to date it precisely.

a significant assemblage belonging to the 5th–7th centuries AD [see Chapter 5, ***Fig. 18***, Site 01].[16] To the north of the hill, a further structure has been identified: a wall aligned parallel to the shore, of unspecified date. Not discussed in the survey, elusive as they might be, are the vegetation patterns characterised by parallel lines at the slopes of the hill, almost perpendicular to each other [see Chapter 5, ***Fig. 18***, Site 01]. These might be a sign indicator of the ancient agricultural interventions in the topography; the existence here of a vineyard or an orchard can be hypothesised, but its exact character and dating require further investigation.

Further to the west, at the highest point of western part of the peninsula, a group of built structures has been identified [see Chapter 5, ***Fig. 18***, Site 02]. It consists of a basin of 12.1 m × 6.7 m made of limestone blocks and red brick and rendered inside with waterproof plaster (*opus signinum*); at the northern side of the basin, remains of further structures are also visible (Blue, Khalil, and Trakadas 2011: 117, Site 02). This complex, as seen within the surrounding topography, should be perhaps seen in the context of agricultural activities. The further three sites (03–05), identified for the first time in 2004, are located on the northwestern shore [see Chapter 5, ***Fig. 18***]; they are now submerged, including Site 05, where a pier was previously identified. Our prospection of the western end of the peninsula suggests the existence of a winery complex here. The extreme southwestern promontory of the peninsula consists of the exposed parent rock, and the south-turning elongated cape can be seen as a natural formation.

Moving southwards from Philoxenite but still within the peninsula, on the hills about 300 m south from the southernmost extremities of the built-up area, remains of buildings erected with stone blocks and rubblework are visible on the surface (V4). The hilly base of the peninsula was not subjected to a detailed survey and the existence of further remains cannot be excluded. The whole area between these southern hills of the peninsula and the town can be interpreted as having been exclusively used for cultivation of crops in the Byzantine period.

At the southern lakeshore, almost directly west of the beginning of the peninsula, the archaeological site "Akadémia" is located. The evidence collected on this site attests that this area was cultivated land with an irrigational system, contemporaneous to that known from the direct vicinity of Philoxenite (Pichot and Şenol 2014; Nenna 2015; Pichot 2016; Nenna et al. 2020b; 2021). Moving along the ancient road to Abu Mena facing south, less than 1 km after leaving the peninsula, a further significant structure can be found: a building with doubled peristyle courtyard [***Map 1***]. It might have been part of the eastern extremities of Mit Abul Kom (see above). The area of the peristyle building was excavated in the 1970s and 1980s by Fawzi el-Fakharani and surveyed by Mieczysław Rodziewicz (el-Fakharani 1983: 182–184; Rodziewicz 1988a; 1988b; 1991; 1998b; Grossmann 2002; Rodziewicz 2003). At the time of its discovery, this structure was treated as the hitherto largest known peristyle complex in northern Egypt, additionally equipped with a church and a baptistery. Its exact function, however, remains disputable (el-Fakharani 1983: 184–186; Rodziewicz 1988a; 1988b; Haggag 2010: 53). Approximately 300 m southeast from the peristyle complex, a winery is located and about 1 km from it, in the same direction, cavities cut into the rock with complex structures above, interpreted by Peter Grossmann as *gerontokomeion*, can be reached. This area, which also has a church, was occupied in the Byzantine period (referred to as Hauwarīya-South; see Abdal Fatah and Grossmann 2000; Grossmann 2002: 395–396). There are

[16] Blue, Khalil, and Trakadas 2011: Site 01, which had been also partly excavated by Supreme Council of Antiquities.

several further remnants of smaller settlements in a radius of 16 km from Philoxenite. Towards the south and west, the modern names of these localities are: Hawwārīya, Qasimiya, Zawiyet el-Iseila, Sidi Mahmoud [see ***Map 1*** and the map in Nenna et al. 2020a: 48]. They create a picture of a densely populated area with the land for the most part cultivated in the Byzantine period. Also worth mentioning is a pattern of settlement distribution: it creates strips parallel to the lakeshore and the ridges: 1 km south of the lake (i.a. churches at el-Quasimiya [Grossmann, Abdal Fatah, and Bolman 2009; Solieman 2007] and Sidi Mahmud [Grossmann and Khorshid 1994; 1998]) and another one about 5 km further south (i.a. Sanyet el-Asila [Grossmann and Kościuk 2007]) from the lake. The strip of land about 6 km north from Abu Mena seems to be scarce of archaeological remains but this might also only be a false impression based on insufficient data.

Among the most characteristic remains in the area described here and also within the peninsula itself are amphora production sites and wineries. The tradition of wine production in the region can be dated to at least from the Saite Period (664–525 BC) as is attested for the environs of Plinthine on the northern bank of the lake (Rodziewicz 1998a: 29, 36; Redon, Vanpeene, and Pesenti 2017; Boussac and Redon 2024). Numerous amphora kilns, especially on the lakeshore, eastwards from the peninsula, have been identified (Empereur and Picon 1998: 76, Fig. 1).[17] The vast majority of them, however, predate the settlement and can be dated to the Roman period (production of the *amphore égyptienne* [AE] 3 and 4); in at least seven kilns, the production of later amphoras AE5 = LR5/6—contemporary with the existence of our settlement—has been confirmed, and those are concentred in the direct vicinity of the peninsula (Empereur and Picon 1998: 85–88). These highly specialised pottery workshops are a proof of the existence here of a once vibrant viticultural region, as is known from the written sources.[18] The majority of these workshops seem to have ceased their work in the 6th–7th centuries.[19] This image is complemented by numerous wine presses, remnants of which have been identified in the vicinity. Several examples of wineries are known from Abu Mena, while other recognised examples are scattered in the vicinity of Hawwārīya, 200 m southeast from the above described peristyle building with a church and baptistry east of Mit Abul Kom and further west in Borg el-Arab (Rodziewicz 1998a: 34). They were similar to the wineries of Delian Hellenistic types and such forms were present in this region from the Hellenistic period. About 4 km from the mentioned winery in Hawwārīya, at the route to Abu Mena,[20] the site of Karm el-Agarma can be reached (see also Nenna 2018: 636, especially sites referred to in the *Carte archéologique de la Maréotide* as GMR0129 and GMR0133), and 4 km further on, Karm el-Bahma. The Arabic term *karm* (كرم) can be translated in this context as a vineyard (Nenna at al. 2020a: 36). *Karms* are also attested to in the area south from Abu Mena, like el-Baraasi, Gadoura, and aš-Šuwaīlhy/el-Shwelhy (Abdel Aziz Negm 1993; Abd el-Aziz Negm 1998a; Abdel Aziz Negm 1998b; Grossmann and Abdel-Aziz Negm 2000).

[17] The distribution of the amphora workshops, of which the majority identified were active in the Roman period, can be coordinated with the extent of the lake as reconstructed for that period by Crépy and Boussac 2021—they were located on the more eastern part of the western arm of Lake Mariout.

[18] Strabo (*Geographica*, XVII I 14), Athenaeus (*Deipnosophistaí*, I 33d–e), Horace (*Odes*, I 37), Virgil (*Georgica*, II 91); see also Rodziewicz 1998a.

[19] The wineries and amphora kilns were thematised in several works, the most important so far are Empereur and Picon 1998; Dzierzbicka 2005; 2010; Pichot 2012; Pichot and Şenol 2014; Pichot 2016: 58–59; Dzierzbicka 2018; see also Chapter 4 in this volume.

[20] For the general maps of Abu Mena, see Engemann 2016: Figs 1–2, and general overview of dating the development of that site on pottery finding (Engemann 2016: 9–16).

The spread of wineries and pottery workshops cannot be taken as fully representative as they constitute only a fraction of those that once existed in the area. Even further south of Abu Mena, at least in the 6th–8th centuries, a village like mentioned aš-Šuwaīlhy/el-Shwelhy [***Map 1***] existed, boasting multiple winepresses, decorated houses and a church in the form of three-nave basilica (Grossmann and Abdel-Aziz Negm 2000). Some wineries were still functioning after the Arab conquest, like the one in Abū Mīnā (Grossmann 2019: 51) which was in use in the 11th century AD, as noticed by the Andalusian traveller Abū ʿUbaid el-Bakrī (1014–1094) (Rodziewicz 1998a: 28 n. 8).[21]

On the northern bank of the lake, almost opposite the western wing of the Philoxenite peninsula, a place with a long history of habitation was identified, which continued from the late 4th century BC to the 7th century AD (Blue, Khalil, and Trakadas 2011: 151–153, Site 201). This site is only one among the array of further sites located westwards on the northern bank of the lake. Material collected during the survey in these scattered spots suggests a similar history of occupancy. The area east of the highway Sidi Krir – Borg el-Arab Airport was not studied within the Lake Mareotis Research Project but there is no reason to believe that it had been less habitable than the western part of the northern shore of the lake.

In conclusion, the region south of Philoxenite in the 6th or 7th century AD cannot be considered a deserted area. The distance between inhabited places was rarely longer than 4 km. The population density and the importance of agricultural production for the Alexandrian economy was already substantiated by the Lake Mareotis Research Project in the context of but not limited to the lakeshores (Blue, Khalil, and Trakadas 2011: 295–300).

The peninsula and its settlement

Introduction to the general description of the site—topography

The main characteristics of the terrain on the peninsula have already been mentioned; it can be added that its relief can be roughly described as a row of acclivities and declivities of various depths, with the most extensive lowland in the central and widest part of the peninsula. The concentration of built structures is located at the northernmost part of the peninsula and especially on its northernmost cape, which will be later also be referred to as "the promontory" [see ***Fig. 5*** and District H]. It covers relatively even land over the first 50 m from the lakeshore. The land borders of the ancient town can be unambiguously recognised on the topographic map of the site on its western and southern parts due to the land structure and the amount of rubble visible on the surface. This area protrudes above the surrounding land, creating an elevated platform densely covered with the debris of buildings. It is also noticeable that the shape of the natural geological features of this area is not reflected in the borders of the urbanised area, which were subjected to geometrical planning principles and in its extension not confined by natural landform, except for the lakeshore. The town was established in the slightly elevated northern area of the

[21] The economic and ownership structure of the wineries remains an open question. It is known that in this region domains of the Alexandrian Church were located, as derived from *Miracula of Saint Cyrus and Johannes*, *miraculum* 8, see el-Abbadi 2010: 8.

peninsula:[22] the highest point does not exceed 8.5 m above the current water level and is atop the waterwheel (SQ2) of the western baths (T2), which is 8.44 m above the current lake water level and 10.47 m above sea level (MSL 1906). The second largest hill enclosed in the urban complex, southeast of the main urbanised area with exposed parent rock and its cavities were of a specific character, serving as a necropolis [see ***Fig. 6***]. The westernmost hill at the northern shore, distanced from the urban settlement, was a place where a spacious grange was located and its function seems, at least at the current state of exploration, bound to the agricultural area in the southern and southwestern part of the peninsula.

The description and analytical focus are on the time of the planning and primary functioning of Philoxenite between the mid-6th and mid-7th centuries AD. Older and later activities will be only mentioned if they have relevance concerning the form of the urban structure during its main period or, in the latter case, contributed significantly to the distortion of the general image. During these at least one hundred years, the functioning of the town experienced changes which are recorded in the archaeological evidence, but only a fraction of it has been extensively studied. Due to these conditions, the image of the city depicted here is based mainly on the last phase of occupation, with the spatial maximum reached in the 7th century, and the decline in the Umayyad period a consequence of hydrologic, economic, and political factors. No later than in the second half of the 8th century the town was depopulated, its buildings deprived of furnishings and the building material itself was reclaimed (Gwiazda 2023b).

As the description focuses here on the urban structure and the architectural form, the main features of the town require at least a short introductory note in order to visualise them. The buildings, with their colours, volume and detail are what first and foremost affects the character and cultural imprint of the space. In Philoxenite, the architectural forms of the predominant urban fabric can be visualised in the most generalised terms as follows: the stone walls of the buildings were covered with lime plaster and their surface for the most part was whitewashed. The residential buildings had flat roofs whilst gable roofs might have distinguished more spacious buildings such as churches. The roof surfaces were covered in both cases with stone tiles and/or plaster. The windows, at least in the public and sacral buildings were stucco transennas with bluish-green glass windowpanes and the courtyards, streets and paths were, if not paved with rectangular stone slabs, then tamped with earth, crushed mortar and stones (see also Kucharczyk 2009; Gwiazda and Pawlikowska-Gwiazda 2019: 69, 74; Derda, Gwiazda, and Pawlikowska-Gwiazda 2020: 537; Gwiazda, Derda, and Barański 2022: 338).

As indicated above, we are dealing with a site whose area was subjected to gradual abandonment, reclamation of the building stone and its erosion,[23] and accumulation of aeolian sedimentation but was not reused for agricultural activity or new settlements. Approximately 2.8% of the site as depicted on the general map has been subjected to any archaeological investigation so far; the survey combined with the data from archaeological investigation in the form of several trenches is the basis for the following presentation of this settlement.

[22] Earthworks as a preparatory levelling of the land before the building works should also be considered, see Derda et al. 2020: 572 and chapters concerning W1-3, W1-4 and W1-5; Gwiazda, Kotarba-Morley, and Derda 2024.

[23] The erosion of the primary building material can be very rapid, as observed in the structures exposed during excavations in the late 1970s: in some cases, varying in the characteristic of the stone itself, more than 50% of an ashlar volume can be turned into sand in consequence of the atmospheric factors over fifty years.

Description of the settlement disposition by district

For the analysis and better navigation, the area was divided into several districts designated sequentially with letters from A to M [***Fig. 7***]. Their borders correspond as far as possible to the character of the remains. However, they should be treated only as an analytical tool as in many cases the exact character of a district cannot be defined exactly and they therefore serve as an approximation. The navigation and the "sightseeing" of the town will follow the route as if the town were being entered by a pilgrim travelling by water from Alexandria, landing at the northern pier (P3) and moving southwards, firstly to the eastern parts of the town, then to the western ones. This route is hypothetical and serves here as an aid in guiding us through urban structure of the town; pilgrims would also disembark at the pier at the western baths (P2). The westernmost parts of the archaeological site will then be described, followed by the agricultural area, whose characteristics will here be touched on only briefly (for more on this, see Chapter 7).

District A—the northernmost part of the peninsula

District A was one of the most prominent in the urban sense [***Fig. 8***]. It constituted the climax of the whole peninsula as this was the site of the largest church in the town—the great basilica with baptistry (B1) [***Fig. 9***] crowning the townscape and would have been seen by incomers arriving from the Alexandria by the waterway through Lake Mariout. The northern head of the promontory of the peninsula covers an area of approximately 20,000 m^2 and was surrounded mostly by water, as only about 150 m of its total circumference of 600 m forms the land connection. The whole shoreline was artificially shaped, as pertains to a whole urbanised area (districts A, B, C, D, and I), of which the almost 1100 m long lakeshore was the site of construction works. The urban settlement as a whole covered 110,000 m^2, not including the scattered complexes of districts J, K, L, M and the area of necropolis in District H.

This district can be reconstructed as a densely built-up area with practically all the shoreline accommodating mentioned extensive remodelling works (from east to west): the relatively low southern and eastern shore was defined by a stone embankment (2) to its limit in the eastern part where a latrine building (L1) was integrated, as well as further waterfront infrastructure (4), of which the most significant is the 120 m northern pier (P3) [***Fig. 10***]. The role of this pier requires at least a short elucidation, as all three piers on the peninsula (and the fourth one on the island [Pichot 2012: 98]) were built in different manner and from different sizes of ashlar blocks. In particular, the pier in the vicinity of the basilica (P3) with structures at its base (5, 15) bears traces of several building interventions, which indicates its complicated building history. It seems plausible that it was already constructed in accordance with the pre-existing wine and amphora production in the area and only later incorporated as a part of Philoxenite.[24]

[24] The stratigraphy of the piers was described in Babraj and Szymańska 2013: 172–175 and it was noticed that the first 31 m of the pier (P3) displayed a different manner of construction, especially in its lower part. The feature present in the pier, at the stones on the eastern side, at 15 m from the shore, are dovetail-shaped clamps. They were also used in the embankment stones near the triangular docking bay (9) on the western part of the peninsula. In the context of the water structures, they were used as a temporary stabilisation for the stones while the mortar was setting. This technique was extensively used in the Mediterranean in the antiquity and was inherited by the medieval masons. For reference, see Adam 2008: 57; de Vos 2013; Châtelet and Baudoux 2016; Ulrich 2017.



Fig. 7. Plan of the archaeological site with borders of the districts marked (drawing A.B. Kutiak)



Fig. 8. Plan of District A with numbering of the most important structures (for explanation, see the chapter text). Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

The lakeshore westwards from the pier was naturally ascending and created a relatively steep bank, as here the parent rock reaches the level of about 5 m above the current lake level. This northern lakeshore (6) at a distance of 165 m was unified with the waterfront wall made of ashlar blocks in an almost straight line (slightly changing its direction twice, 8°30' after first 30 m from the pier and 6° after another 74.5 m). It turns at almost a right angle at the northwestern corner of the peninsula, where the natural rock formation was not so steep, creating a relatively flat cape tip not much higher than water level, which was left outside the linear built structures (7). At the western bank of the district, a vertical wall of embankment was replaced with structures functionally opened to the waterfront (8). The character of the building founded on the stone cape cannot



Fig. 9. Panoramic view of the great basilica (photo A.B. Kutiak 2022)

so far be determined. Only the structure located southwards can be more easily elucidated. Here [***Fig. 11***], an outstanding urban situation was revealed: an artificially constructed triangular docking bay of 8.35 m × 6.85 m × 10 m, integrated with the shore walls (9). Its form suggests it may have been a derivation of the *kibotos* harbour.[25]

This harbour was dedicated to small vessels (no longer than 7 m). They were well sheltered in this location from northern winds thanks to the natural rock tip of the peninsula,[26] which must have been even larger at the time of the harbour construction considering the natural process of erosion. From the south, the harbour was limited by a built platform (10), which can be identified as an extension of the street leading to the atrium of the basilica (11). For a pedestrian, just after climbing few steps at the slope of the peninsula,[27] the entrance to the atrium and—depending on the form of the western wing of the atrium—the western gate to the basilica could have been visible. This small docking bay must have been an entrance of some importance, judging from its formal and functional location within the urban fabric. In contrast to the long pier at the eastern part of the peninsula, which was able to receive heavy maritime traffic, this small harbour would have disembarked incomers comfortably, but only in limited number. The line of the western embankment (12) of this triangular harbour continues for the next 90 m southwards in a straight line in the direction consistent with the axis of the *odos* in District B. The exact original height of the embankment remains unclear. Directly south of the stairs (13), leading from the triangular bay, a built structure of a height of at least one storey can be reconstructed, creating a kind of avant-corps of 3.25 m width (14). The axes of the buildings south of the probable street leading to the atrium (29) are consistent with the western shoreline.

Within the head of the promontory of the peninsula, enclosed by the geometrically defined shore walls described above, a densely built-up area can be identified. Its urban fabric was designed

[25] For Mareotic harbours, see Rodziewicz 2002.

[26] The rock itself was cut at its northern part to create 6.7 m long trapezoid shelf.

[27] In the context of steps at the waterfronts, see Rodziewicz 2002: 6–7. The stairs at the Mareotic harbours and their step piers can be understood as facilities allowing use during different levels of water fluctuating because of the Nile floods and/or rains in the region.



Fig. 10. The northernmost point of the promontory: facing the north, from the area where remains of structures at the base of the pier (P3), partly cut into the parent rock, can be identified (5, 15) (photo A.B. Kutiak 2019)



Fig. 11. The triangular docking bay at the western end of District A, with the surrounding area densely built up and the shoreline defined by the ashlar embankment, except for the westernmost rocky cape (photo A.B. Kutiak 2019)

on the geometric grid, as was almost the whole area of the town. The main blocks of buildings within this district can be described as follows:

The eastern *insula* with the courtyard building (H1) and neighbouring northern buildings was constructed on a modular scheme (16) (see Kościuk 2012; Gwiazda and Pawlikowska-Gwiazda 2019; Derda et al. 2020; Gwiazda 2023a: 200–201). Directly behind the courtyard building, at the lakeshore, the latrines (L1) were located and there were further buildings of unclear function north of these (4) (Derda, Gwiazda, and Pawlikowska-Gwiazda 2020: 538–542). At the base of the pier there are structures (5, 15) functionally connected with it, with their walls built directly on the parent rock, which was artificially shaped and therefore integrated into the whole structure. The elaborate shore infrastructure is nowadays only partly preserved, and platforms and short pier-like structures coordinated with the latrines (L1) east from the walls are now submerged in the lake water (3). The buildings of the *insula* might have been used (if an archaeological find can be taken as sufficient argument), at least at the end of the 6th century, as the seat of an administration office. Here, at the southern wall of the courtyard building (H1) a collection of documents on potsherds (ostraca) was unearthed; the documents contain accounts of construction works in Philoxenite, probably undertaken in the last quarter of the 6th or the first decade of the 7th century (Babraj, Drzymuchowska, and Willburger 2014: 53–54; Derda 2020; Derda and Wegner forthcoming).

A street (17) of approximately 17.85 m wide divides this eastern building block from the central rectangular area of 50 m × 97 m, incorporating the great basilica and its atrium. Some peculiarities of this street have been revealed in Trench S1 (Gwiazda and Pawlikowska-Gwiazda 2019: 65–68; Derda, Gwiazda, and Pawlikowska-Gwiazda 2020: 534–538), showing that the surface of the street was not paved with stone slabs but tamped. The street (18) along the northern façade of the *insula* by the basilica is of similar width and was extensively paved. This space was actively used as a traffic corridor, but also as a place of lively trade and craft activities, not only in the numerous rooms in the wings of the atrium but also in the public space of streets. Based on the recent discoveries, it is possible that the public space here was enclosed by wooden stands, mounted in the pits in the stone paving of the street.[28] From this northern street (18), the *insula* of the great basilica was also accessible. The area was serviced with public latrines (19), which were often visited judging by the smoothened stones of the doorsteps leading to its rooms. The surface of the streets was slightly inclined towards the lake, thus preventing the rainwater flowing down from roofs to stagnate. North of the *insula* of the basilica, a sequence of buildings (or one block of buildings) was situated, facing the lake to the north, with elaborate architecture and (presumably) porticos opening onto to the lake, though this has not yet not been fully ascertained (20) (Kościuk 2012; Derda, Gwiazda, and Pawlikowska-Gwiazda 2020: 543). The buildings also served as an architectural barrier, sheltering the northernmost street of the town and the *insula* of the basilica (B1) from the northern winds.

The urban situation at the western end of this street is unclear (21). It was probably a cul-de-sac, as the dense remains of buildings northwest of the atrium would indicate; here a dense and

[28] The multitude of holes carved in the street paving at the northern wall of the basilica was excavated during the season 2022 by Krzysztof Babraj, Daria Tarara, and Anna Starzycka. Its number, diversity, and layout suggest intensive use over years.

complicated urban fabric can be identified. The height of the preserved walls is, however, relatively low. Also unclear is the situation in the northwestern part of this district, which was enclosed by buildings from the embankments of the lake and was reached mainly from the east and south, whereas infrastructure connecting it with the lake from the western rocky cape cannot be excluded.

The border between the atrium (11) and the relatively dense urban fabric at the northwestern side is worth noticing because of the changing directions of the buildings' axes. The direction of the walls of the northwestern corner of the district does not follow that of the walls of the basilica and its atrium, but their axes can be interpreted as coordinated with the direction of the western embankment. Its chronology and functional connections, however, remain unclear.[29] Among these structures a row of very narrow compartments (0.75–1.00 m between walls) is worth noticing (23), though their exact form and function cannot be recognised in the present state of research—they were either separate rooms or low enclosures within rooms. At the northern frontage of the street, buttresses are noticeable (24), perhaps remnants of a portico, similar to those at the northern elevation of the baths complex in District D. However, the exact urban situation, especially in an area of as high importance as the entrance to the atrium (25), remains an open question, especially as we do not know the form of the street (with or without portico), nor can we determine the form of the urban space in front of the entrance. Another question concerns the presence of a gate leading to atrium. The area south of the triangular docking bay (29) was also densely built up, but the character of these buildings is still unclear.

The atrium of the great basilica (B1) is the main public space in this district (11). The atrium was subjected to archaeological investigation of its eastern part (Szymańska and Babraj 2004: 62; Babraj and Szymańska 2009; 2010; Szymańska and Babraj 2012), where remnants of a portico have been revealed as well as a row of rooms of commercial function in its southern wing. Its phasing is complicated, as the different compartments at the atrium wings were once open, once closed from one side or another. The atrium together with the great basilica was enclosed by attached buildings, creating a regular *insula* surrounded by streets of a width of approximately 5.5 m [***Fig. 12***], with the exception of the western side. Here the *insula* was mainly integrated with the neighbouring buildings, and its façade was probably limited to the presumed entrance section. The southern side entrance (26) to the religious centre of this district and the whole town, omitting the wide *exonarthex* (27), led to the southern nave of the basilica at the *esonarthex*. This entrance was at the line of the eastern frontage of the *odos*, which lead to the *insula* from the eastern baths (T1), through District B. Another side entrance (28) allowed access to the *exonarthex*.[30]

In District A, in contrast to the remaining parts of the town, elements of an older settlement are unambiguously traceable. They were also a factor taken into consideration during the planning works for the town in the 6th century and had an influence on the urban outline of the building in this area in addition to the natural formation of the shoreline and the parent rock. In this part of Philoxenite, an earlier Roman occupation has been confirmed. The most important structure of

[29] Ashes and slag are identified in the western, and especially southwestern part of the district (Derda et al. 2020: 556–561).

[30] The stratigraphy of the *exonarthex* signifies gross changes in its connection patterns: it was not constructed together with the basilica but added posteriorly; the entrance (28) was also blocked at some time. The *opus sectile* paving of *exonarthex* was dated on basis of the amphorae and used as foundation for the marble tiles as for the 7th century AD, according to Babraj and Szymańska 2009: 120–121.



Fig. 12. View from the northernmost building block of District B towards the complex H1 in the background, showing the coherence of the urban and architectural planning (photo A.B. Kutiak 2019)

the Roman settlement is an amphora kiln, which was used as a foundation for the eastern apse of the basilica (B1). The kiln was part of a big amphora production site, which was referred to as the workshop of Διονύσιος/Dionysios, and its functioning is estimated to have begun in the 2nd century AD and to have ceased production in the first half of the 3rd century AD (Szymańska and Babraj 2004: 62; Gwiazda and Wielgosz-Rondolino 2019: 263; Derda, Gwiazda, and Pawlikowska-Gwiazda 2020: 547). According to Mieczysław Rodziewicz, the majority of pottery kilns in the region were located near the shore and serviced by small harbours. The assemblage of the pier, amphora kiln, and remnants uncovered under the house (H1) would fit into this scheme. If so, the pier (P3) might already have been part of infrastructure functioning in Roman times as a part of larger rural estate exporting its products (Rodziewicz 2002: 3; Babraj and Szymańska 2013: 172–175). At that time, the neighbouring island was still occupied, and there was a large complex of mixed functional use (including baths) (Pichot 2014). The Roman structures, apart from a presumably older phase of the pier (P3), and the foundation of the apse of great basilica (B1) did not influence the outline of the urban grid in the 6th century AD in principle, as they had different directions. However, the direction of the axis of the basilica must already have been defined before the main planning campaign as it follows the direction of an older, smaller basilica (B2), which was demolished to make room for the great basilica (B1) (Babraj, Drzymuchowska, and Tarara 2020).

In summary, this district can be seen as one of the most liveable and visited areas of Philoxenite. It flourished in the direct proximity of the basilica, where the most important religious events of the town, if not the whole microregion, were held, drawing numerous visitors. The ostraca found

in one of the rooms of the atrium demonstrate that in the late 7th and early 8th century Philoxenite was still a busy trading post, not only serving the pilgrims but also constituting a transportation hub for the goods produced in the agricultural hinterland (Derda 2020: 64–66).

District B—the *odos* with the adjoining town blocks

The main street of District B [***Fig. 13***], directly south of the great basilica, can be considered one of the most important circulation spaces within the whole town, connecting the *insula* of basilica (B1) with the eastern baths (T1). This wide avenue, referred to here as ὁδός (*odos*), was 258 m long. From the southern entrances (26, 28) of the basilica (B1), the eastern baths complex (T1) at its southernmost end would have been visible [***Figs 14–17***]. It might have had the form of a colonnaded street similar to those known from Abu Mena, but also Iustiniana Prima, Constantinople or Antioch.[31] Its role as a major urban corridor is beyond question: it connected the important districts of the town and was surrounded by buildings, at least partly two or more storeys, constructed in a regular manner along its whole length, affording accommodation and services to incomers and inhabitants. However, whether there was a colonnade or any other form of portico is unclear, as only small part of the street has been excavated.[32] This biggest linear urban space is approximately 22 m wide and was defined by blocks of building of 80 m in length. Between the blocks, at regular intervals perpendicular to the main *odos*, were narrow streets of approximately 5 m in width.

The outline of the town-blocks in this area is in principle rectangular, but was changed both in the northern and southern part.[33] While in the north, the lack of perpendicularity was a consequence of the topography of the promontory and was harmonically resolved, the southern junction, and especially the spatial configuration of the baths (T1), is distorted despite the absence of such topographical constrictions. In the urban outline taken as a whole, the longitudinal axis of the bath deviates by about 18° from the east-west direction of the grid of the *odos* and its perpendicular streets. The axis of the baths complex (T1) is not much more coherent than District I, where the axes of the surveyed structures are not the same but deviates by about 11° from the axis of the baths and altogether 30° from the *odos*.

Without doubt, the complex of the baths (T1) was integrated into a bigger *insula*, the exact dimensions of which remain unclear.[34] Only on the north side was the complex of the baths open to the *odos* and adjoining streets—their junction formed a small square (32) at the eastern side, at the waterwheel (SQ1). From the southwestern side, this *insula* was adjacent to District G where the main road leading to Abu Mena perhaps began, as can be surmised from the topography and urban structure. Therefore, the *insula* of the baths played a role in closing off the main body of the town from the south. From the east it was adjacent to District I and, in its vicinity, the area

[31] The borders between terms and the legal meaning of the urban terminology in Late Antiquity remains obscure, the term used here chosen as a descriptive tool (Lavan 2020: 34–43 and personal communication).

[32] The archaeological investigation of the *odos* was limited to the trench of 3 m width, which allows only a narrow window for more generalised speculations (Derda et al. 2020, Trench W1-St2).

[33] The important junction area of the promontory southeast of the basilica with the *odos* and its northeastern corner is covered with debris deposited from the basilica and remained inaccessible for the survey.

[34] Cf. Szymańska and Babraj 2008b: 27, Fig. 12, where it was described as freestanding structure. Also, directly south from the excavated area of the baths (T1), a mound (30) conceals further unexcavated structures.

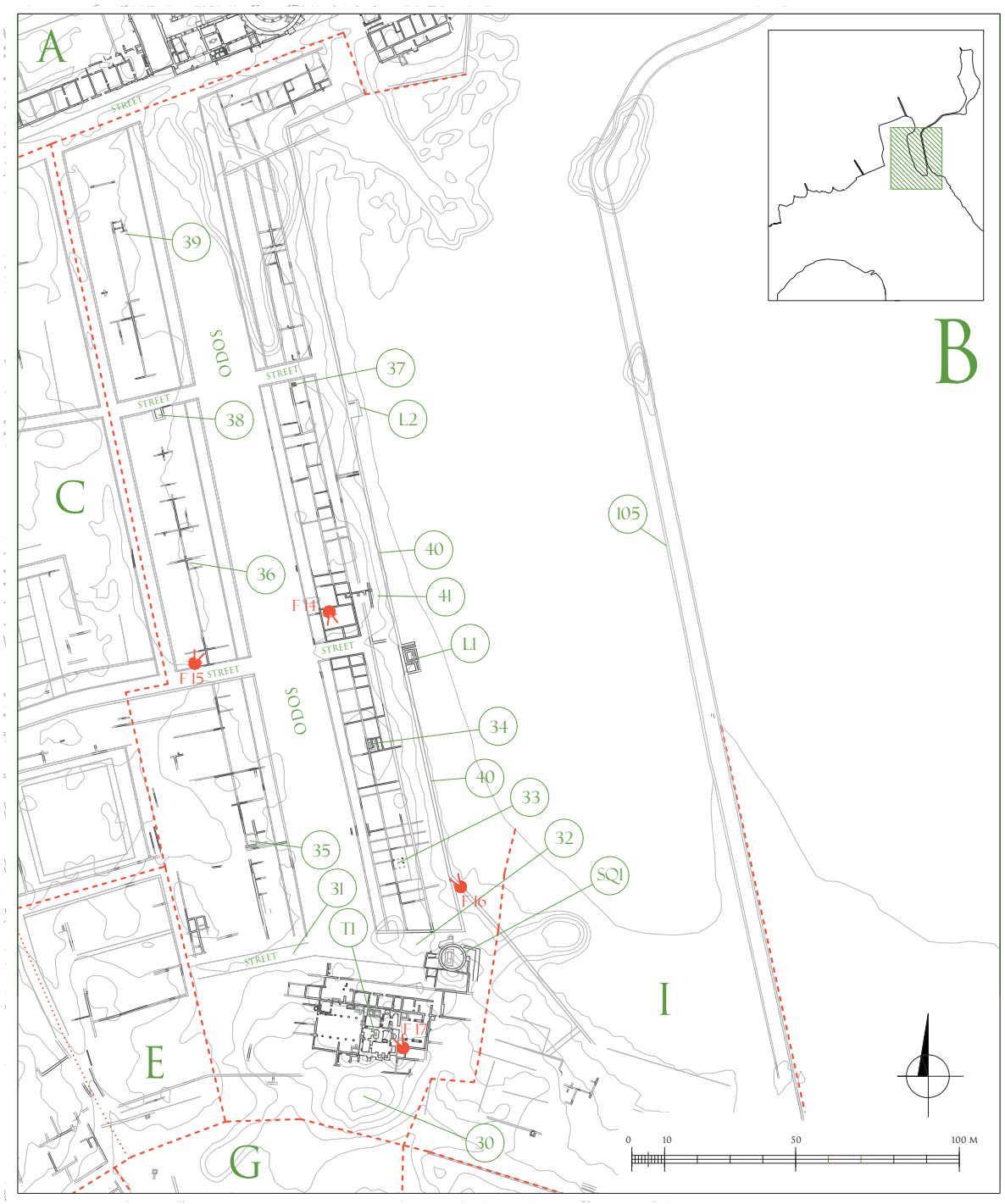


Fig. 13. Plan of District B with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)



Fig. 14. The eastern part of District B as seen from District A, facing the south; the current road, seen on the right side of the photograph, follows the route of the *odos* (photo A.B. Kutiak 2018)

of the necropolis within District H commenced. These two areas were, however, hidden behind the complex of the baths and the eastern frontage of the *odos*. The urban structure would guide the visitor more westwards, to District C, the next to be described.

The detailed reconstruction of the urban qualities of the *odos*, having a lean-to porch of wood or stone at least of some kind at the peak of the development of the town, remains in principle an open question. As in other places, stone paving has also here been excavated, but in the southern section of the *odos*, and can be dated to the later phase of the town.[35]

The picture of the architectural framing of this space must remain vague, but that the building was constructed with ashlar stones, on modular though diversified plans, is clear (see also Gwiazda 2023a: 202–203). Among the structures of importance identified in this district are staircases, but it should be expected that their number will increase during extensive excavations of this area.[36] The identified staircases comprise two flights (34, 35, 36), with masonry stones at least at the height of two first steps. The baths and other buildings were here serviced by a system of sewers; also, a well or cistern opening is visible on the surface (37) (Szymańska and Babraj 2008b: 28).

[35] Derda et al. 2020: 572, Trench W1-4; Gwiazda 2023b: 22–23. Also here, at the southern part of the *odos* a form of porch about 1 m wide is traceable. In this later phase, an area approximately of at least 2.8 m from the line of the so-called porch was paved with regular, rectangular limestone slabs. If this extent was repeated on the other side of the street, it suggests a reconstruction of the *odos* divided into three main sections: in the middle approximately 12 m wide, devoted to carriage traffic, and almost 3 m wide pedestrian sections on both sides. See trench stratigraphic unit W1-4-005, majority of paving had been looted in the abandonment phase.

[36] The excavation in the main *insulae* of the district was conducted in trenches W1-A and W1-B (Derda et al. 2020: 561–572).



Fig. 15. The western side of District B, in its middle part, at the staircase area (36) (photo A.B. Kutiak 2019)



Fig. 16. The embankment (40) of the eastern shore of the promontory as seen from its southern end (photo A.B. Kutiak 2019)



Fig. 17. District B seen from the caldarium of the eastern baths (T1). The current road follows the axis of the ancient *odos* (photo A.B. Kutiak 2022)

The image of the architecture becomes more complicated, as about 20 m north from the southernmost street (31) stones were found which could be identified as heavily eroded segments of column shafts, partly *in situ*. Their arrangement suggests a small atrium with a portico (33).[37] The state of preservation of the western *insulae* is much worse, but it is clear that it was planned on at least similar if not the same geometrical principles and as consistently as the eastern buildings were [see ***Fig. 15***]. The much worse visibility of the structures is reflected in the survey, as the western *insulae* could not have been depicted with the same detailing as the eastern.[38] Also here the remnants of wide staircases (35, 36, 39) indicate that the buildings had at least two storeys and were fully realised at the whole span of the *odos*; although their function remains to be resolved. Among other structures in this area, a brick basin (38) of inner dimensions 2 m × 2.7 m is worth mentioning, adjacent to the northern side of the mid-western *insula* of this district.

Behind the eastern *insulae*, at a distance of 7–10 m from the outer walls of the buildings, the shoreline along its whole length (235 m) was defined by a stone embankment (40) [see ***Fig. 16***]. The width of this ashlar structure varied in width, having on average 0.8 m, in contrast to the

[37] The standard and detail of this at least partly residential architecture was of high-quality, judging from the architectural plan and architectural details located in the area: In the proximity of "the atrium", a fragment of a small column shaft, about 0.15 m in diameter, made of nummulite limestone was found. Especially in the southernmost part of District B, even during this superficial cleaning works, pieces of marble slabs were found. They may have belonged to the furnishings of the building or, alternatively, have been dragged there from the nearby baths. The findings of fragments of marble slabs are not restricted exclusively to this part of the district.

[38] This area, as an exception, was inhabited in the 20th century, as Bedouins housing was recorded by Mahmoud Sadek (1978).

majority of the walls on the site, which were approximately 0.3 m or 0.6 m in width. The embankment was planned and primarily constructed in one building campaign; it is parallel to the axis of the *odos* but also to the causeway structure limiting the eastern boundary of the east harbour basin and connecting the island with the mainland (the causeway to the island, also having the function of a breakwater, will be described District I). There are two structures adjacent to this waterfront: latrines (L2, L3), the southern with dimensions of 3.5 m × 5 m, at the current state of preservation; and seemingly smaller, the northern one has dimensions of 4.2 m × 9.3 m. The archaeological investigation has shown that they were not built together with the embankment, as their walls are not bound. Because of the pottery assemblage recognised in the foundation strata, the construction of the latrines took place after the mid-6th century AD (Derda et al. 2020: 561–565).

The strip of land between the eastern *insulae* and the waterfront, its surface made of tamped sand and silt, also served as a connecting path for the eastern harbour (Derda et al. 2020: 565–569). It seems that this waterfront did not play an important or prestigious role in the urban structure; it was subordinate and purely functional, allowing access to the eastern *insulae* from the rear and from the eastern port mainly for their inhabitants. It might, however, have been of some importance for operating the adjoining harbour. The architectural framing of the waterfront is rather modest, in contrast to the northern waterfront in District D. This backyard was a place where garbage disposal at least occasionally took place, and not earlier than in the 7th or early 8th century at the eastern walls of the primary *insulae* buildings, new structures were erected that extended toward the waterfront (41) (Gwiazda 2023b: 21–22). Their construction technique and the quality of the material used were inferior to those from the main phase, but still they can be treated as buildings planned on geometrical principles.

District C—the western part with the mill (M1)

After this hypothetical stroll down the *odos* and visit to the southern baths (T1), one would go westwards along the northern wall of the mentioned baths complex and then turn right, northwards, to reach an important urban space in the town (A3) [***Fig. 18***]. Another way of getting there would be to take the western street at the *odos*, by the southern latrines (L3) in District B. The latter street was in fact a part of the longer communication axis, which at 275 m long, was practically equal in length to the *odos*. It begins at the *odos* and continues westwards, north from the square (A3), then along the lakeshore, western baths and other complexes (W1, W4, T2), practically to the end of the main urbanised area. It was not so consistent in its outline and was much diversified functionally and formally in comparison to the unified space of the *odos*. Either way, one reaches one of the most intriguing areas on the site, topographically central and functionally a junction point in terms of urban structure. The central square (A3) is almost perfectly quadratic at 31 m × 31 m and located at the crossroads of the town. Its shape is currently visible as a depressed area in the southern part of this district, additionally signified by grass vegetation, uncommon for the rest of the site [***Fig. 19***].[39] Based on the magnetic survey and character of the built structures surveyed in the area (42), it is probable that the square was an open space within the densely built-up urban fabric (Derda et al. 2021: 132).

[39] This grass from the genus *Cynodon* grows only in these areas of the site, where water is kept on surface for a relatively longer time that the surrounding area, but the soil is too shallow to support taller vegetation.



Fig. 18. Plan of District C with numbering of major structures; orange symbols indicate viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

In terms of function, this area was located between District B with its south-north communication axis of the town being the *odos* and the second important urban east-west axis in its two lines. The northern led along the lakeshore (partly in the form of a corniche), while the parallel southern street led to the western suburbs of the town, delineating the border between districts D and E. The architectural shape of this square (A3) and its function must remain obscure until further archaeological works are undertaken. Its outline and the construction technique of the stone structures surrounding it (42) show similarities to the putative sheltered arcade along the baths (T2). The commercial buildings (W2) and remnants of paving are also visible in its immediate vicinity. It might have been of the more elaborate urban and architectural quality characterising District D, especially in its northern, lake-facing part.

North from the square up to District A, the urbanised area continues. The basic outline of the structures here was mostly based on the results of magnetic survey, as a relatively small portion of the structures is visible on the surface and therefore accessible to the mapping of the remains [***Fig. 20***]. The exception are the remnants of a mill (M1) [***Fig. 21***], which was excavated in the years 1977–1981.[40] The deposited mound of debris in the near vicinity of this building prevents speculation about its immediate surroundings. The outline and axis of the structures in the northern direction (45) follow that of District B. However, the plans of the buildings are much more diversified and, as in the case of the mill (M1), display different techniques compared with the *insulae* at the *odos*. The axes of the walls in the vicinity directly south of the mill (43) mostly follow the direction known from the previous district. At about 25 m south from the mill (46), their direction changes, adjusting to the axis of District D. Also directly north of the square (A3), the direction of the secondary street coincides with that of the corniche of District D. The stone embankment (48) consistently follows the direction set in District A, then changes direction at the mill (M1) and heads towards the complex of the latrines (L4). The urban situation at the border between districts A and C (51) remains unclear but there must at least have been a functionally important junction between the street south of the basilica crossing at this point with connecting paths west from the atrium.

The mill (M1) is the only structure in this district that has been almost completely unearthed, and hence more detailed description can be provided (Salah el-Din Moussa 2003; Haggag 2010: 51). As mentioned above, the heaps deposited during excavations obscure the image of its direct relations to its surroundings. Its location at the extension of the walls at the shore side encourage study of its functional relation with the lake. The technological features of this building, with eighteen rooms, two of them equipped with a horizontal runner stone and bed stone pair made of red Aswan granite, offer support for interpreting this building as a mill. The presence of a cistern or a well, at least 2.8 m deep, and an extensive channel (44) suggest water was crucial for the technology and operation of this mill. Given its atypical building technique—so far unknown from any other structure on the site—where ashlar blocks were interchanged with brick layers, extensive use of gutters at the outside walls, and a slightly distorted angle compared to the rest of neighbouring structures (of 2–4°), allow us to hypothesize that its construction is to be seen as not contemporaneous with the majority of the surrounding buildings, at least in districts A, B, and C.

As already mentioned, the western edge of this vicinity (48) is a continuation, in terms of outline and construction, of District A. This lakeshore section was serviced with much more diversified infrastructure than the eastern one. Some of this can be identified as latrines (L4)—the most extensive known on the site, having dimensions of at least 20 m × 10 m [***Fig. 22***].[41] Sewer outlets

[40] Salah el-Din Moussa 2003; three building phases of the mill (M1) were identified, and its early dating 5th–6th century AD was proposed. See also Haggag 2010: 51, where this building was identified as a bakery. See also Szymańska and Babraj 2008a: Figs 1–12, where it was depicted after reconstruction works of 1985 (cf. Salah el-Din Moussa 2003: 484).

[41] The western latrines (L4) gained the name "enigma building" (see map of the site by V. Atef in Haggag 2010: 52). As they were already explored during the 1970s, multiple interpretations have arisen over the years: from a dry-dock, a fishery or a building for votive offerings in honour of St Menas and St Marcus. See Haggag 2010: 52, where the list of possible functions has been proposed—but except that of the latrines. The first interpretation comes from Mahmoud Sadek (1978: 70), the second one from Karl Petruso and Creighton Gabel (1982: 12), ascribed also to Nikkos Lianos (Haggag 2010: 52), the third one from Fawzi el-Fakharani. The building was properly identified as latrines, by Mieczysław Rodziewicz (2010: 71).



Fig. 19. Area A3 seen from the east, with the noticeable fragments of massive ashlar structures (42) surrounding this depressed area (photo A.B. Kutiak 2019)



Fig. 20. The northern part of District C, facing north. Remains of structures built with ashlar stones are visible, together with a reddish concentration of pottery sherds within building complex 45. District A is visible in the background (photo A.B. Kutiak 2019)



Fig. 21. The interior of the mill (M1), seen facing the northeast, with a runner and bed stone made of red Aswan granite (photo A.B. Kutiak 2019)

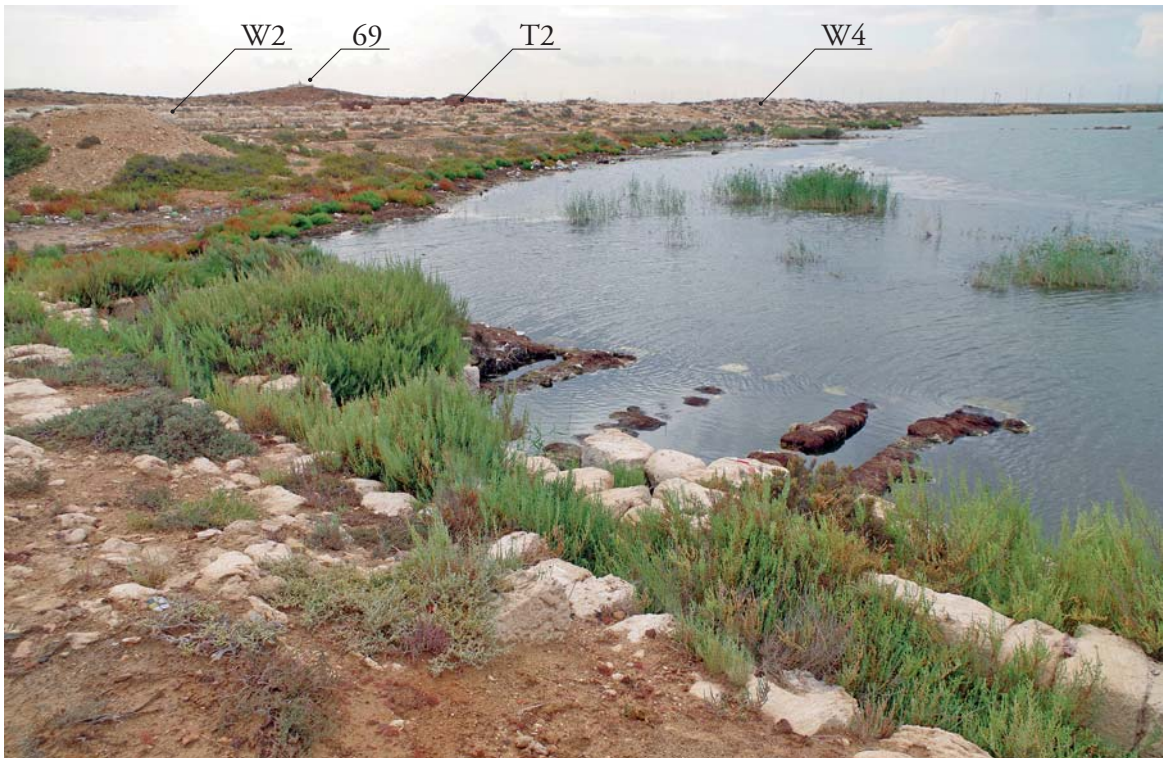


Fig. 22. Latrines (L4) and sewage channels (50) at the southwestern shore of the promontory. In the background, the embankment of District D is visible, with the excavated structures of W2 and T2 and the unexcavated mound of W4 from left to right. Further behind rises the prominence of District E with the remains of a waterwheel (SQ2), and at its highest point the grave of Raya (69) (photo A.B. Kutiak 2019)

were also located here (50), running from the town area, and structures which could have served as small piers lie 19 m north from the mill building (49). Remnants of further structures (47) are also visible, but their function cannot be identified at this point in the research.

The exact character of this area remains vague, though it is attested as having a manufacturing function, at least the middle part of the vicinity and in the last occupation phase.[42] The area south of the mill (M1) with the largest latrines in the town must have been often visited and was well connected with the embankment area of District D. The most southerly part of the district was in fact a crucial element in terms of urban structure integrating the core areas of the town, such as the lake corniche with the baths (T2), commercial functions (W2) in the west, and the *odos* in the east leading on to the great basilica (B1) and the eastern baths (T1).

District D—commercial building (W2) and the western baths (T2)

At the angle of the peninsula, at the crossing point of two corniches (northern [52] and southern [53]) this district begins [***Fig. 23***]. A visitor leaving the *odos*, moving westwards through the square (A3) in the central area of the town, would approach another prestigious public space in Philoxenite [***Fig. 24***]. The corner at the base of the promontory itself is worth describing. The excavated corniche surface was paved with regular rectangular stone slabs, at least 160 m long, hinting at the significance of this space in the whole conception of the town. At the corner, remnants of a structure in a belvedere-like form (54) are preserved [***Fig. 25***], which though of unclear function played a role in its architectural framing. This district, as with District A, was an entrance point for pilgrims coming here via Lake Mariout: a pier (P2) was located here, 108.5 m long and therefore the second longest pier on the peninsula, and it is therefore probable that a substantial number of incomers landed here. The structural consistency of this pier, in contrast to the northern one (P3), allows us to suppose that it was built primarily in one campaign along with the embankment. It is not, however, perpendicular to the lake embankment itself, having an angle of 96°40' to the line of the constructed lakeshore. The construction of this pier differs significantly from the remaining two (P1, P3), as an effort was made to reduce the use of the ashlar block: only its sides and the upper part of the pier were built with ashlars, the core part of the pier being constructed of rubblework. Reclaiming of the outer ashlars, especially near the lakeshore, led to the rapid disintegration of this pier.[43]

The vicinity of the corniche was extensively excavated during late 1970s and 1980s, when the baths complex (T2) and the adjacent east buildings (W2) were partly unearthed (el-Fakharani 1983; Sadek 1992: 549; Haggag 2010). Activities in those years were not limited to the excavations but also involved reconstruction. These works, which were partly anastylosis, were concentrated at the embankment wall (58) of this district and the mill (M1) in District C. In the area directly south of the western baths (T2) and commercial buildings (W2), several mounds of building materials for conservation works had accumulated. This material prevented documentation, especially south of the commercial complex (64). Only the northern part of the baths and

[42] Slag and ashes are visible on the surface, especially in the northwestern part, and northeast of the mill (M1). They were an anomaly in the geomagnetic survey of 2018.

[43] See Babraj and Szymańska 2013, where phasing of the pier was also suggested: the pier would be extended after 90th m of its length; see also Gwiazda, Derda, and Barański 2022: 349–351.

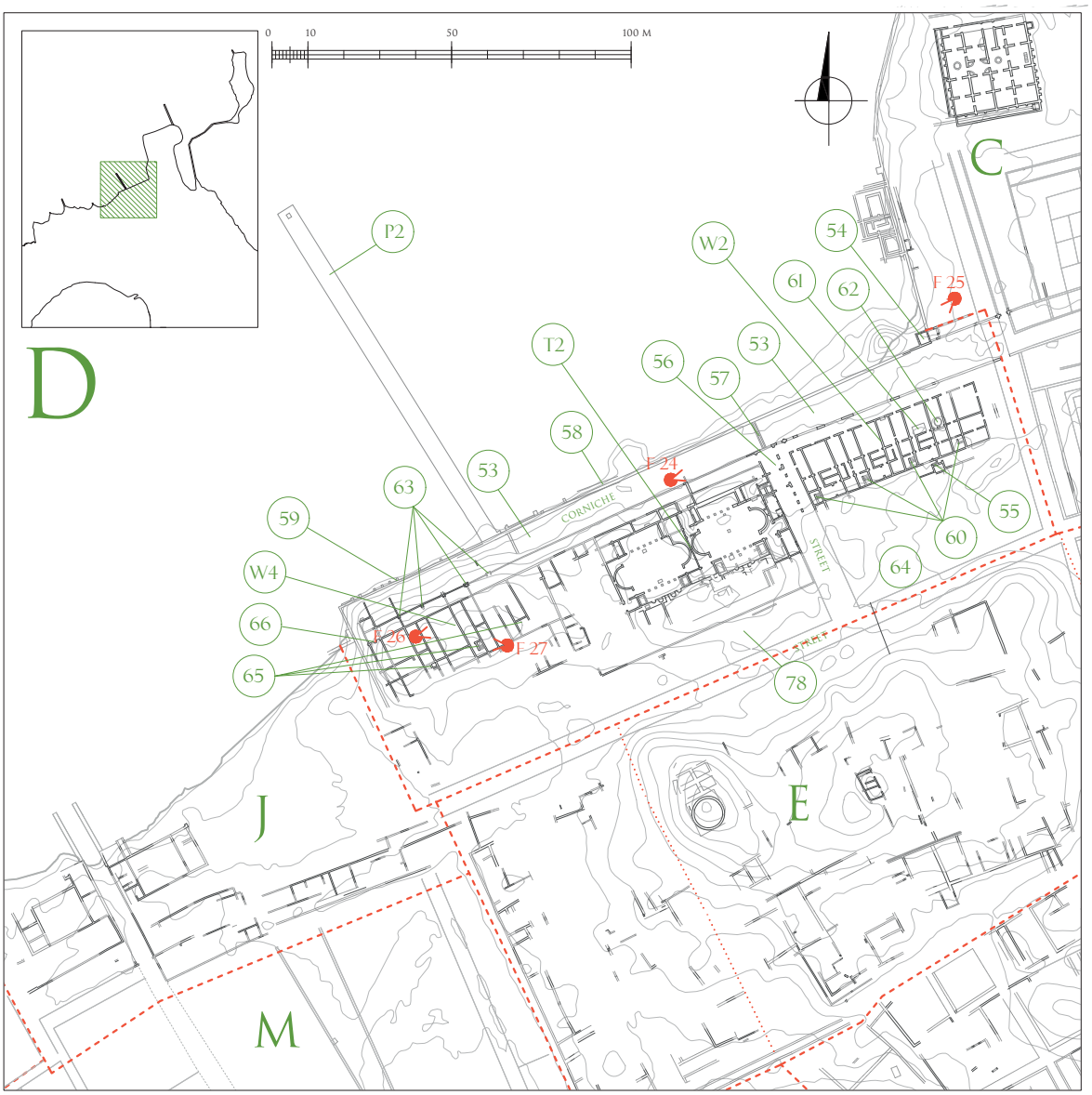


Fig. 23. Plan of District D with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

commercial buildings were excavated, as their southern part is buried under silt – partly beneath the mentioned building materials and partly beneath the modern road. The actual extent of these complexes remains especially unclear because the modern deposits disturb the geomagnetic prospections. With the exception of trenches WF17 and P2 at the base of the pier (P2) (Gwiazda, Derda, and Barański 2022: 349–351), this district was not studied any further archeologically in the years 2018–2022.

The district can be divided into three putative *insulae*. The eastern one, directly west of District C, will be referred to hypothetically as a commercial building (W2) because the compartments on the ground floor opened to the street and display remnants of built facilities such as a bread oven



Fig. 24. The corniche seen from the west, with the westernmost corner of the presumed portico of baths in the foreground (photo A.B. Kutiak 2020)



Fig. 25. View from the northeastern corner of District D, towards the corniche, which was one of the most prestigious public spaces in Philoxenite. Remains of a structure of unidentified belvedere-like function (54) just behind the paved area in the foreground (photo A.B. Kutiak 2020)

and stone platform, which mean it was unlikely to have been solely housing. The second *insula*, in the middle part of the district, is the baths complex (T2). The westernmost structures (W4)—here treated as one of the putative *insulae*—is of a different character and different function. This part of the district is, however, the area with the highest percentage of building material accumulated *in situ*, having apparently been subjected to lesser reclamation than districts A and B [***Fig. 26***].

These three *insulae* appear to be an urban area planned and realised during one campaign or in consecutive campaigns and based on a single comprehensive urban layout. This conclusion must be tentative, as the buildings show some deviation from a strictly perpendicular plan. In particular, the eastern *insula* (W2) was modified so that it creates a kind of changeover in the directions of the axes in District B and the southern part of District C to the directions of the baths' complex (T2). This transition took place in the *insula* of commercial buildings (W2), giving it a trapezoid shape. These measures can be explained by the assumption that it was forced to maintain the regularity of urban spaces, in this case, the streets. It must have already been undertaken in the planning phase, given that the economy of space usage and precise planning within the limited areal of the peninsula was evidently an important factor. It is possible the buildings were planned together with the urban layout, or, as also cannot be excluded, the urban grid was defined first and the buildings fitted into the street grid later. In either scenario, the geometry of the urban space was treated as a priority. Such an approach can also be traced in other parts of the town and will be discussed, together with the planning of the town, later in the analytical section below.

From the functional point of view, the three areas create one complex, connected and united by a 160 m long and 8 m broad corniche almost along the lakeshore (53), which is the westernmost section of the street stretching from the *odos* westwards for nearly 275 m. The quality of the



Fig. 26. General view of District D from the west (photo A.B. Kutiak 2020)

paving and the extensive adaptation of the lakeshore made this embankment a prestigious part of the whole urban settlement when compared with the much more backyard character of the eastern embankment in District B and the area of lakeshore with latrines east of the basilica. The baths and the whole *insula* of the commercial buildings were at least partly opened with porticos to the corniche. A form of sheltered passage was in all probability located (56) between the baths (T2) and commercial buildings (W2). The high quality of the urban detail, stone paving, elegant and spacious complexes with portico or arcade façades created a salubrious lakefront. As on the northern promontory of the peninsula, the corniche might have served as a reception point for incomers. However, this spacious corniche and architecturally framed lakeshore made this area a much grander urban space than the one north and east from the basilica. It must have played an important role in terms of the visual recognisability of Philoxenite.

The attention to architectural detail and the opulently framed urban space was not only devoted to the open, public space of the corniche, but also to the buildings and their interiors. The only half-excavated baths (T2) in the middle of the district were of much superior architectural quality compared to the eastern baths (T1) in District B, both in their monumental planning and the spacious, basilical bi-apsidal mirrored interiors of the frigidaria as well as the internal marble adornments of the baths.[44] They are superior also in mere volume, quadruple that of the eastern baths (T1); the eastern are a little over 600 m^2 in total and the western about 1200 m^2 in the cold sections alone (area measurement after Fournet, Redon, and Vanpeene 2017: 485, 487). Though the eastern baths (T1) were also decorated with wall paintings, these were of much more modest architectural plan compared to the western baths (T2). There has been much deliberation about the western baths (T2) in the literature, their dating even being proposed as the late 4th century AD, but there is no known archaeological evidence to support this claim. In the light of the building archaeology, it should be seen as approximately two centuries younger.[45]

The commercial *insula* east of the baths (W2) was spatially integrated with neighbouring ones; throughout the district, all the *insulae* are harmonised in their architectural patterns of modularity. They bear some similarities it their planning character to those along the *odos* in District B as they were also built with the use of certain modules, repeated at every span (see also Gwiazda 2023a: 203–205). The buildings (W2) east of the baths (T2) can be interpreted as functionally of a commercial nature in their northern part. In the later phase, a round brick bread oven of over 2 m (62) diameter and in an adjacent room a stone platform (61) are attested. Spacious rooms accessible from the lakeside portico were available for the customers. The tenants were also comfortable, as dwellings on the upper floor were accessible by wide U-shaped stairs (60), and even a private latrine (55) behind the bakery (62) can be identified. The unexcavated *insula* (W4), west of the baths (T2), also gives an image of comparable planning quality, but with a different function,

[44] See Fournet and Redon 2017: 308–312; Fournet, Redon, and Vanpeene 2017: 487–488. The dating of baths was estimated from the 5th to 7th century AD, also published with schematic plan in Sadek 1992: 552.

[45] In Grossmann 2003: 15 presented datings of the baths complex (T2) extend even to the late 4th century or the early 5th. Peter Grossmann compared the building and design quality of these baths with those in Abu Mena. That the first were more opulent should not be treated as sufficient support for their earlier progenity. This dating was repeated in Babraj and Szymańska 2008a: 13; see also el-Fakharani 1983; Sadek 1992. In Haggag 2010: 54 estimated for the 5th and 6th century AD, in Fournet, Redon, and Vanpeene 2017: 485 for end of the 5th century/beginning of the 6th century AD; the outcomes of excavations in trenches P2 and WF17 also do not support earlier dating (see Gwiazda, Derda, and Barański 2022: 349–351).



Fig. 27. One of the stone staircases (65) identified within area W4 (photo A.B. Kutiak 2020)

as yet unknown. One of the characteristic elements used regularly at the northern, outer wall of the complex is a square brick-stone structure (63), which repeats at regular intervals, every 6.2–6.5 m. The buildings at this *insula* were also at least two-storey, as suggested by the massive quarter-turn staircases (65) [***Fig. 27***]. Here modular architecture also gives way to diversified interiors, with more elaborate features as in the eastern complex of shops, such as in the north-western corner of the district, where a room with an apsis was documented (66).

This district played an important role in the whole settlement—it was an entrance to the town, but also a destination in its own right in the functional framework of Philoxenite. The western edge of the district also defined the western boundary of the core of the urban area. At this point, the dense urban fabric defined by the *insulae* and a web of streets ceases and becomes a looser structure. In the following lakeshore districts J, K, and L, which were still subjected to planning based on geometrical principles, space was organised beyond the scale of the individual building.

District E—the hill and adjacent areas

The district is geologically the most prominent on the entire site and comprises 18% of the urban complex [***Fig. 28***]. One more feature makes this district different from the whole built-up area: there is no regular grid of streets and clearly delineated *insulae* can be encountered in contrast to the relatively clear urban structure covering the remaining town area. This district is especially different from districts B and D in that it is heterogeneous in its architecture and outline characteristics.



Fig. 28. Plan of District E with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

It can be divided into three sub-districts on the basis of their outline, the character of the architectural remains, and topographical features. The easternmost sub-district borders with districts C, B, and G, and rises only slightly above District B and the square (A3) at the southern District C. Its outline was coordinated in the northern part (68) with that of the grid of the *odos* and the central square (A3), while in the southwestern as well as its central part it tends to be more irregular. The eastern putative *insula* of District E borders District G at the south, where it no longer displays an urban character. Of importance for the whole urban structure were the southeastern and western limits of this sub-district. There might have been a southern entrance to the town here, an exit from Philoxenite in the direction of Abu Mena. No wide street comparable to

the *odos* leading to southern perimeter of the town can be traced either in this area or elsewhere in District E. At the southeastern border of this district, in the vicinity of the possible entrance to the city, a water well or the opening of a cistern is traceable (67).

The central part of District E is also the most elevated part of the whole town, with the waterwheel in its northwestern corner (SQ2) at the very highest point of this plateau, ca. 8.5 m above the lake level [***Figs 29–30***].[46] The northern slope of this district, at the border with District D where a modern road is located, is covered with silt and debris, which have slid down, so identifying structures without more extensive cleaning is impossible. It may be that the line of this road follows the path of the ancient street (78) leading from the southwestern corner of the square (A3) to the western extremities of the town. Directly north of the waterwheel (SQ2), the remains of brick structures—water reservoirs (70) [***Fig. 31***]—connected functionally with the waterwheel are visible on the surface (Derda et al. 2021: 133, Fig. 12). This infrastructure fed the western baths (T2), which are located downhill, 30 m northwards from the basins. The remains are the only major clearly functionally identifiable structure in this district. The visible patterns of dense urban structure on the surface, however, reveal major building complexes. The first one neighbours the waterwheel from the south (71); the second one, presumably with a courtyard, is adjacent to the eastern side (72). In common with most of the buildings in the previously described districts, these complexes were erected with ashlar stones. Here, however, we encounter for the first time on this scale the second important type of wall structure; these are characterised by the extensive use of the rubblework as the dominant building material. The statics of such walls were strengthened by the use of ashlar blocs at the corners, wall junctions, door jambs and every essential span in longer walls. This type of wall structure will be referred to here as rubblework although the strengthening of the walls with cut stones, sometimes with vertically laid stone plates, suggests similar construction principles to *opus Africanum*. However, insufficient high sections of the walls were excavated to more exactly define the character of this masonry technique used in Philoxenite. About half of the middle part of this district was constructed of rubblework, what might be also treated as an evidence for later development of this part of the settlement (see more in the subsection "Urban analysis").

The surveyed structures of this district, the majority of which can be taken for building walls are characterised by their variable directions, what applies to both types of construction. At least eight different directions can be identified. Although the time of the setting here the new structures are consistent with the great urban works of the 6th century AD, a different attitude to the layout of this area was chosen since the rest of the settlement was subjected to relatively rigid patterns of urban grids. These specific characteristics can be determined by the fact that this less geometrically strict architecture would suit better the topography of the hill, which is of natural origin. Whether the reason for these differences is only the topography or other factors played a role (e.g. the date of construction) cannot be answered without proper archaeological investigation. So far, only one place has been studied archaeologically. It is in the middle of this small plateau and consists of three rooms of a larger complex constructed with ashlars stones (F2). The archaeological investigation dates it as erected in the Byzantine period, during the main building

[46] Over the ruins of the waterwheel, presumably in the second half of the 19th century, was erected a tomb of Raya (69), a local holy woman. At festive occasions, the gravestone is covered with a green cloth. This custom, followed by very few in this area, might be linked with Sufi traditions (personal communication with the local Bedouins, with special thanks to Cora Peters for interpreting). Compare its better-preserved form with Sadek 1992: Fig. 4.



Fig. 29. District E as seen from its southernmost corner. The noticeable straight lines of a rubblework wall running perpendicularly from this point in the northeast in a north-westerly direction were also borders of the main urbanised area of the whole town (photo A.B. Kutiak 2020)



Fig. 30. The prominence of District E as seen from its eastern sub-district, the latter being of more even topography and having building of plans similar to those from southern parts of districts C and B (photo A.B. Kutiak 2020)



Fig. 31. The area of the waterwheel (SQ2), with a vertical stone of Raya's tomb (69) and brick remnants of hydraulic infrastructure (79) in the foreground (photo A.B. Kutiak 2020)

activity at this site. Its less regular outline is not due to reuse of the foundations of some older structures (Gwiazda, Derda, and Barański 2022: 353).[47]

The western parts of District E are located at a much lower elevation than its middle and eastern part due to its natural topography, being on average 4 m lower than the waterwheel (SQ2). The geometrical form of the western and southwestern border of this sub-district are clearly visible [see ***Fig. 29***]. And indeed, in contrast to both sub-districts previously described, this area was planned on a relatively rigid perpendicular grid. The western edge of this district (73) was designed as a straight line integrated with the urban grid of the adjacent District D and comprised an outer wall of a single building or building complex (74) of approximate dimensions of 80 m × 50 m. The border of the district was also a border of the urbanised area, displaying a straight geometrical outline along the western and partly along the southern section of the whole town. Outside these walls, the agricultural area, here referred to as District M, commenced.

The buildings which once existed here were erected predominantly from rubblework. However, their remains are only faintly visible, prohibiting any straightforward interpretation of their function. However, regarding the architectural character of these buildings, the surface findings, especially in two areas, do allow us to hypothesise that more elaborate architecture features once existed here, as scattered remnants of marble tiles and regular stone paving have been discovered,

[47] This place was partly excavated by "The Mobius Group" attempting alternative methods of survey, which were conducted in the year 1979. See Schwartz 2009: 67.

especially in the central area (74). The surface deposits are diversified; several pottery mounds (75, 76) and ash deposits have been identified.

For District E taken as a whole, communication patterns are difficult to identify. Only the traces of an outer street are recognisable, especially in the lower northern part, close to District D (78), between this district and District C (76), as well as at the southern border, near District F. At least some of the streets or paths were served with water channels and/or sewers; their remnants are detectable on the southern slope of the hill in the middle part of District E (79).

To sum up, the whole district is of the most complicated topography and urban outline in Philoxenite. Its infrastructure played a role, especially at the highest point, in facilitating (SQ2) sufficient water pressure for the baths (T2). Some residential buildings can be here hypothesised but whether this was a dominant function of the area remains unclear. This is also the first district where on a bigger scale the rubblework building technique was used and which dominates in the two last remaining districts of Philoxenite, which can be unambiguously described as bearing an urban character.

District F—the southern salient of the town

The built-up area of Philoxenite was mainly concentrated in the coastal zone. But it had a landward salient of narrow, elongated trapezoid shape, stretching approximately 220 m in the southeastern direction, 100 m wide at the northern end and 35 m at the southern, having an area of approximately 15,000 m^2 [***Fig. 32***]. It is parallel to the direction of the presumed main road leading to the mainland and Abu Mena. Interestingly, its shape was not forced by the geological features of the land, as the floor level of the buildings was not much more elevated than the level of surrounding fields. Its current visibility in the hypsometric map of the site as an elevated area is due to agglomerated building debris. Its shape may be due to the pre-existing field boundaries and/or the disposition of irrigational system, as well as derived from the road, which might have defined its eastern boundary. Questions remain as to why this district was settled and took such a shape, and whether this happened because of one planning decision or was a gradual extension of the built-up area.

The district, at least at its western side, was demarcated by a low border wall erected with rubblework (81), with a pathway at the town side [***Fig. 33***]. Low enclosures are known from numerous Egyptian papyrus documents under the name πλαστή (*plaste*). These were not of a defensive character but were barriers for animals and could signify the end of a space of certain status.[48] Its general urban outline is based on organised geometric principles, as revealed by the magnetic prospection and confirmed by the architectural survey. The general outline of this district could be described as based on a grid of perpendicular streets 2.5 m wide, creating *insulae* of in principle 26 m × 20 m in size. Their shape, however, varies, especially at the borders of this district. In the northern part, at the border with District E, a row of smaller structures or *insulae* 14 m × 14 m (80) is noticeable. This framework cannot be treated in the present state of archaeological recognition as an unambiguous street-*insulae* grid, as these blocks might have been integrated in bigger *insulae* and not all of these "streets" were necessarily planned or realised as public spaces—they

[48] I am also thankful to Tomasz Derda for bringing this term from Greek papyri in Egypt into the discussion about the topography of the town. According to LSJ, πλαστή is a "mud-wall or -enclosure".



Fig. 32. Plan of District F with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

might have been passages within building complexes—nevertheless the grid itself and its basic geometric features remain valid.

The next to south row of *insulae* consists of a pattern of larger modularity, which dominates the rest of the district. The pattern was modified in the northwestern part of the district. A significant presence of complexes arranged around courtyards should be mentioned, which is not so evident for the rest for the town. In this area, during the survey, several depressed areas were identified. Although not all of them have been excavated, they bear the characteristics of places shown by archaeological excavations to hide relicts of courtyards.[49] Three big complexes with courtyards

[49] The coexistence of indicative features of topography, accumulation of building debris, their dispersion and characteristic vegetation, supported with by the magnetic prospection and the survey of built structures allow us to present such assumptions.

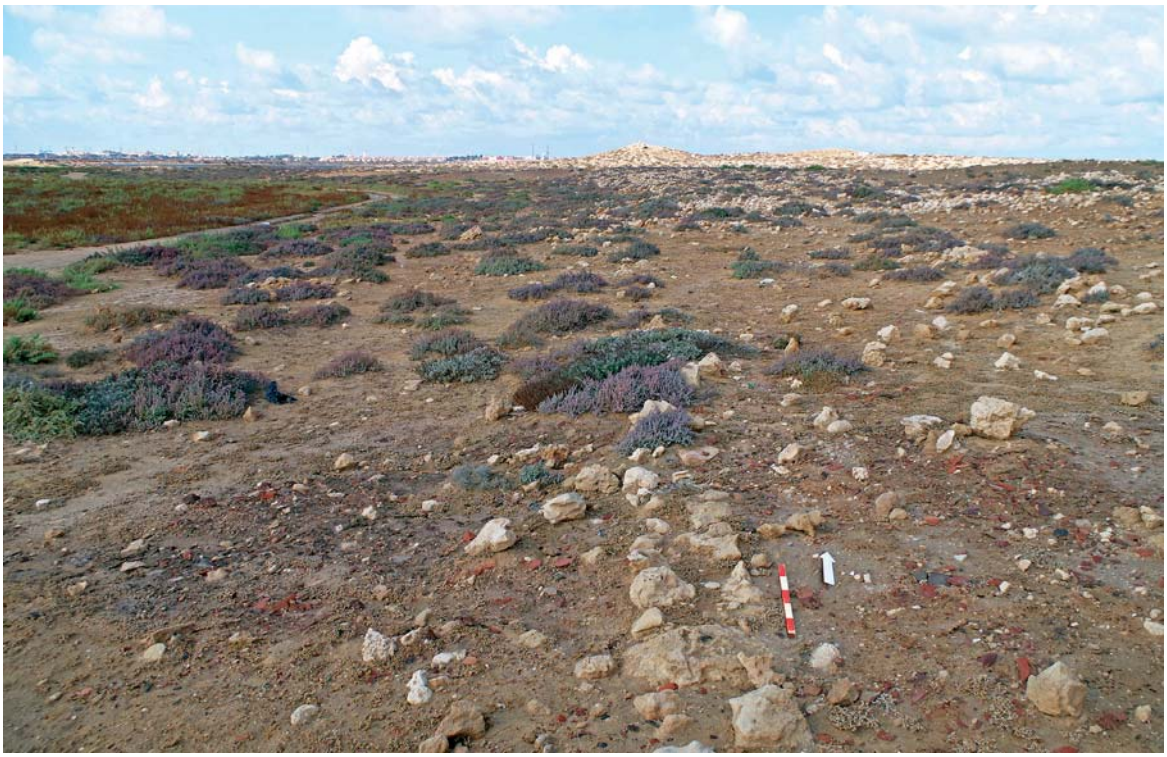


Fig. 33. The western edge of District F, where the straight line of a *plaste* built using a rubblework technique is well recognisable. Left of it once stretched an agricultural area, on the right was the area of the town. In the background the prominence of District E is visible (photo A.B. Kutiak 2020)

(N1, CH3, 83), which together define at least 20% of the whole district, are well attested; the existence of further similar structures in this district is highly probable. The functional character of N1 was clarified in the two last seasons of excavations: in Sector N1, the northern wing of the complex was of sacral character (Gwiazda, Derda, and Barański 2022: 355–366). while the northern complex (CH3) remains unexcavated. From the latter we begin an overview of the structures of this district.

With at least three wings, a courtyard complex (CH3) in the northeastern corner of the district suggests a complex of similar extent to CH2 and N1. A depression in the middle suggests an inner courtyard [***Fig. 34***], at the northern side of which a room of dimensions 9 m × 5.50 m with an oriented apse[50] with traces of decoration is located (82) [***Fig. 35***]. As such it can be interpreted as a sacral building, another church in Philoxenite (not smaller than 9.20 m × 6.00 m). It is possible that the courtyard was a part of a vast complex covering an area of about 1000 m^2. It occupied two blocks of the grid, from the west defined by one of the wings, whereas at the eastern side of the probable courtyard, at the road to Abu Mena, it might have been enclosed by a wall connecting the northern and southern wings. The fragments of nummulite limestone and marble within the space of this likely church allow us to hypothesise about its interior features. Of possible importance is the fact that from the west there is another adjacent room, where hydraulic

[50] The radius of the apse is smaller (approximately 1.05 m) when compared with other apses of the site (in N1 1.6 m and in CH1 1.2 m).



Fig. 34. The northeastern corner of District F with complex CH3, as seen from the south. The depressed area without stones was presumably a courtyard of the complex (photo A.B. Kutiak 2020)

mortar was used for the inner plaster. However, without excavation it cannot be confidently confirmed that the whole area was integrated into one complex though its architectural features would validate such an assumption.

The overall planning consistency of District F offers no simple answers. In the middle of the district, a high mound of waste with significant number of pottery sherds was located (MT1).[51] Despite the regular outline, this district might have functioned as an assemblage of complexes rather than coherent urban unity. The northwestern border of the district was densely built-up, but the character and function of this buildings is yet to be revealed. In this part, beyond the grid and a *plaste*, at the junction of districts M, E, and F, another accumulation of pottery, ashes, and dark coloured silt within a frame of rubblework structures has been found (84). This place was also recognised as place of a magnetic anomaly.

Going southwards, along the middle axis of the district, to the next *insula* south of the mound (MT1), is a likely further complex with courtyard (85). Another complex located almost in the geometrical centre of the district affords better clues about its form and function (N1). On the surface, a depressed area had already been noticed during the survey, signifying a courtyard. Here elements of more elaborate architecture were also identified, such as fragments of a stone cornice

[51] See Gwiazda, Derda, and Barański 2022: 354–355. This heap located in the middle of urban fabric of the salient might be also seen in context of regress of administration and authority, as observed in Abu Mena, see Kościuk 2003: 46.



Fig. 35. Close-up of the oriented apsis (82) in the northern wing of complex CH3 (photo A.B. Kutiak 2020)

or jamb, as well as an eroded marble capital.[52] Nearby, a brickwork construction of a small basin (approximately 3.6 m × 2.25 m) was also discovered (86). The excavations in N1 revealed the complexity and importance of this place. The northern wing houses a church with richly adorned interior and relatively elaborate architectural detail both inside and on its exterior, with a portico of marble columns at its southern façade. At the eastern side of the church, a baptistry was unearthed. The church and the adjacent baptistry creating a short wing of the complex are the only buildings identified in this district as being made exclusively with ashlars stones. The area was subjected to changes after erecting the church; the neighbouring buildings and structures enclosing the courtyard deviate from the direction set out by the church. They were also erected in a different manner than the church, with the use of the rubblework predominant in this district. The buildings in N1 were subjected to further changes and used extensively. Their exact function will be elucidated in upcoming research. We can already say that although this was not the only sacral complex in District F, it was probably the most important one, occupying an area of at least 27 m × 28 m.[53]

South of Sector N1, at the very edge of District F and the built-up area generally, a relatively spacious complex can be also identified (83). In its current state, it is cut off from the main body

[52] A fragment of a fluted limestone column was found there in the 2018 season.

[53] The archaeological exploration of Sector N1 has not been completed at the time of writing. The phasing of the buildings indicate that the rubblework walls were added to the existing ashlar structure of the church.



Fig. 36. The salient of District F, as seen from its southern end (photo A.B. Kutiak 2019)

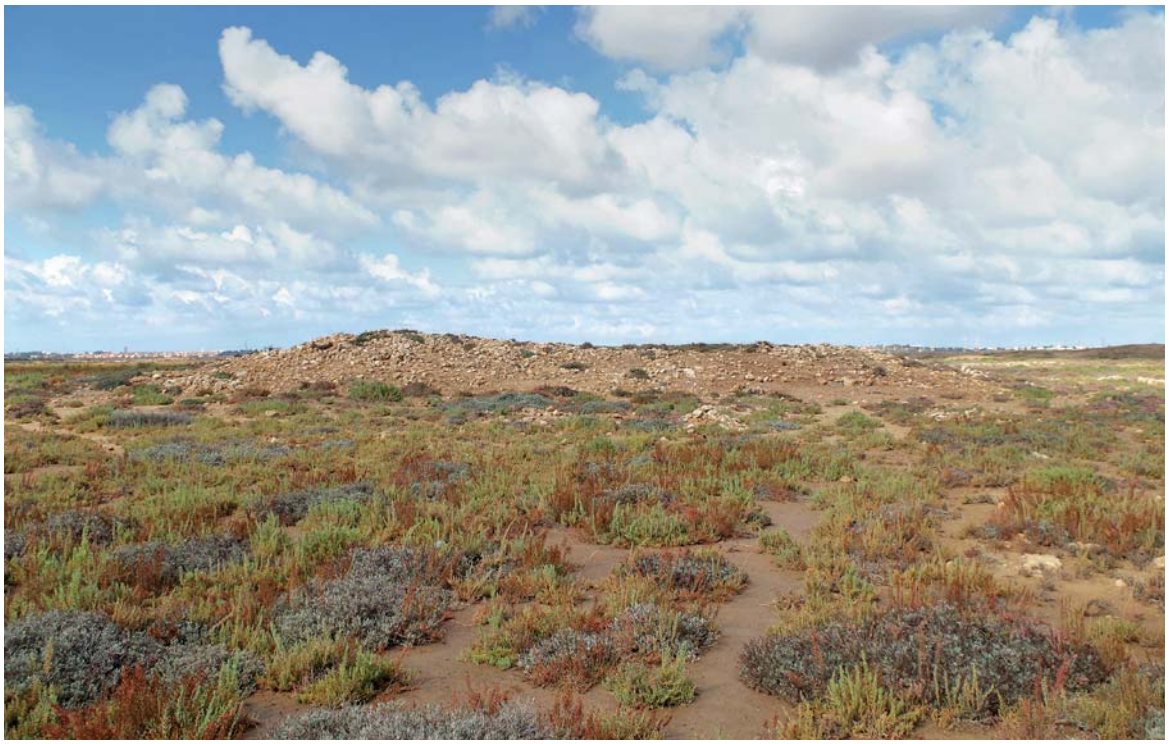


Fig. 37. The accumulated debris of District F creates a sharp contrast between the formerly densely built-up area and the zones dedicated to agriculture. At its southern extremity, the built-up area rises steeply above the grounds of District M (photo A.B. Kutiak 2020)

of the town by a modern road. The walls of this complex deviate by 4° from its northern, more regular part. The structures in its northern part cannot be identified as sole remnants of walls, but more as a platform-like construction, which can be seen just south of the modern road (87, 88). Also here, at least one smaller courtyard (atrium?) can be supposed (83) [***Fig. 36***]. The survey has revealed a spatial dependence of the buildings at the extreme end of the district and the neighbouring fields, which may have been fields and/or gardens cultivated at the peak of the development of the town [***Fig. 37***]. The buildings have doors and openings, giving practically direct access to its surrounding. At least one basin, made of bricks and covered with a waterproof mortar, was attached to the outer western wall of the building (89). This feature seems to be characteristic of the water storage system or of the buildings not enclosed by the urban space, as also revealed in the complex CH2 (see Derda, Gwiazda, and Burdajewicz 2023: 110).

This southernmost complex in this district (89) should not be taken as suburban structures of lower importance or quality. On the contrary, the detailing and features, such as a profiled stone jamb preserved *in situ*, stone cornices, paving with rectangular slabs are comparable with the best examples known from the site. The technique of rubblework wall construction is consistent with that predominant in this district.

District F was established either later than the main area of the town or somehow autonomously from it, as it differs significantly in many aspects. The pattern of the urban and architectural fabric is different, based as it is on a geometrical chequered pattern, with almost square presumable *insulae* and a different ratio of area of streets versus area of *insulae* than in the northern districts, given that such interpretation of structures is accurate. The dominant building material was rubblework; walls erected with cut stones have been identified only in the middle part of the district, with the church and adjacent baptistery of N1. Moreover, the specific location of this area within the topography of the town—outside the main urban tissue but along the main route leading to the mainland—should also be noted. The significance of these structures and their differences from the other districts at the lakeshore make District F an important field for further archaeological investigation. The role of the sacral complexes, their autonomy or their complementarity provoke questions about the possible role of private or episcopal foundations, sanctuaries or monasticism of some kind playing a role in shaping this district.

District G—between District F and the necropolis hill (District H)

This district covers the area between District F and the necropolis hill (District H) [***Fig. 38***]. It has not been investigated archaeologically, so the following presentation is based solely on the surface survey and contextual analysis. As such, they give only limited and vague information about a transitional area between the town and the agricultural area.

Here a significantly lower density of structures and an abrupt ending of the dense built-up area within the limits of districts E and B is visible both on the magnetic image and on the surface. This district cannot be considered an urbanised area in formal terms, rather a suburban one. Here the main road (90) leading to the mainland and to Abu Mena might also be located. This hypothesis, already put forward by Mieczysław Rodziewicz (2003: Figs 3–4; 2010: 71), is based on the topography of the peninsula and the principle of efficiency, as this would have been the shortest way from the urban centre to the mainland. Although the second path, going along the northern

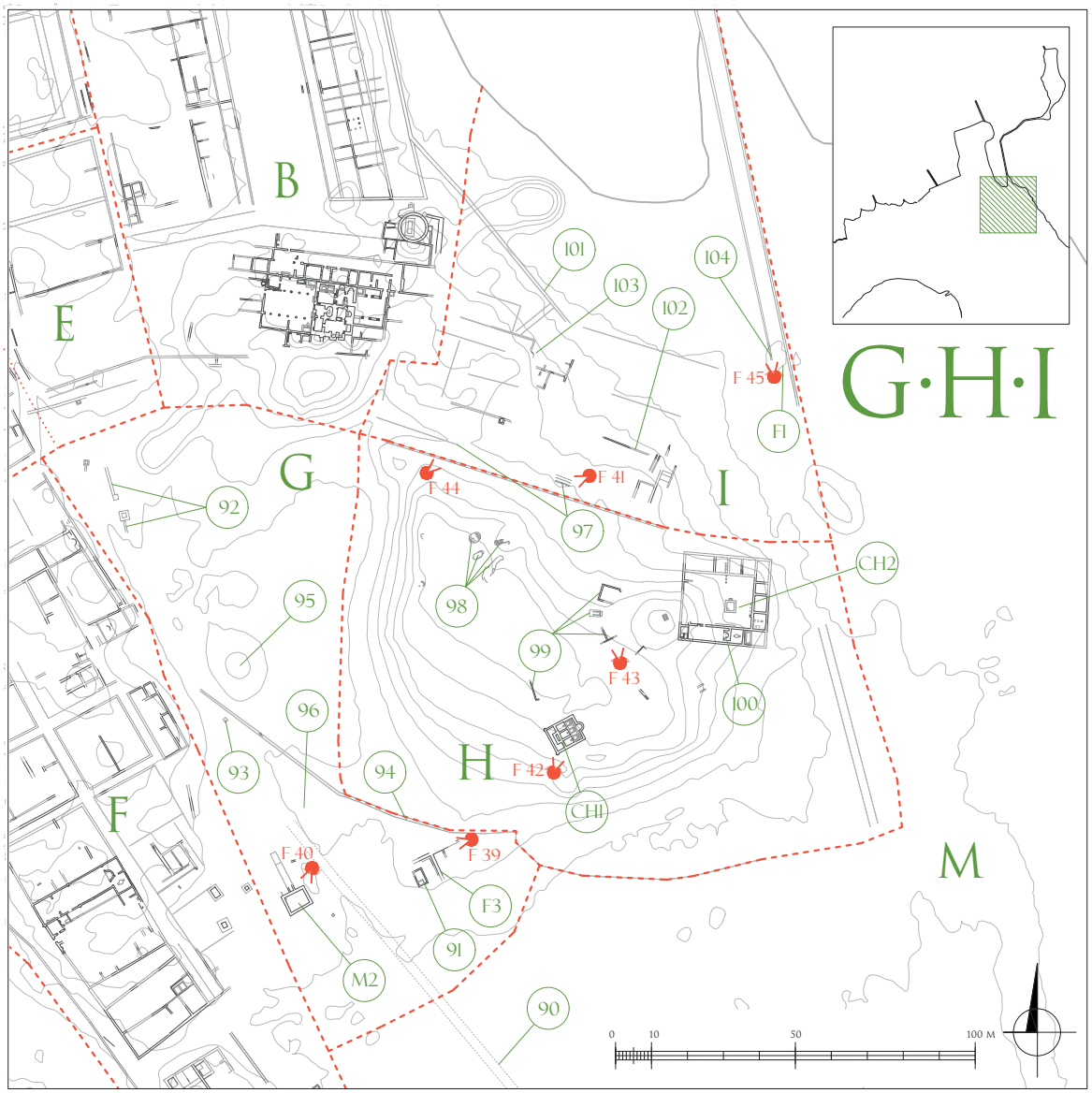


Fig. 38. Plan of districts G, H, and I with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)

slope of the necropolis is geometrically possible, its further route on the lower and therefore marshy land makes it a much less suitable place for leaving or entering the town on foot, by donkey or camel. The depth of the soil in District G is shallow to the extent that in some places the parent rock is recognisable on the surface and would have remained convenient for traffic even after heavy rains. Along this main road, this district is to be divided between the western and eastern parts.

In District G, two noticeable structures are visible without any archaeological intervention. One structure is located east of the main road, at the foot of the necropolis hill (F3). This is of much better quality in terms of building technique: the structure was constructed with the use of



Fig. 39. Remnants of structures (F3 and 9), view from the east (photo A.B. Kutiak 2019)

relatively big ashlars stones (0.7 m × 0.4 m) [***Fig. 39***]. In the western part, about 35 m east from N1, remains of a building of almost rectangular plan of 6 m × 7.3 m were identified (M2) [***Fig. 40***]. Its rubblework walls were founded directly on the parent rock, which is here exposed on the surface.[54] It consists of T-shaped wall remains and a small structure (4.65 m × 3.00 m). Its original dimensions cannot be exactly determined without proper archaeological investigation.[55] The smaller rubblework structure (91) was replastered inside at least once. These two buildings (M1, F3) have little in common, the west part being of very poor quality, but their general direction east-west is practically the same and is much the same as the main direction of the previous district. The second building, thanks to its uncommon features and unresolved immediate context, remains an important starting point for further investigations.[56] Regarding built structures from this district, some scattered remains of presumably hydrological installation are also noteworthy (92, 93).

The eastern border of this district coincides with the base of the natural hill where the necropolis is sited. But this border had the built form of a wall, whose remains are now preserved mainly as isolated ashlars of the primarily rubblework construction, a few meters north from the eastern structure (F3) and follow the northwestern direction for about 30 m. Its more extensive course in

[54] Its outline, building technique and dimensions resemble a building of a presumable mill located on a marketplace of the early medieval phase of Abu Mena (9th–10th century), see Grossmann et al. 1994: 100–101; Kościuk 1998: 204–205.

[55] The magnetic survey does not bring here support, as the parent rock level is very shallow making recognition of stone structures' layout stymied.

[56] Already on the surface here were found a bronze chain, human teeth, as well as the youngest so far pottery known from the site, Mameluke in type. Special thanks to Katarzyna de Lellis-Danys for this identification.



Fig. 40. The relatively well-recognisable outline of a building, presumably functioning as a mill. In the background, the prominence of District F (photo A.B. Kutiak 2019)

the northwestern, southeastern, and eastern directions are partly recognisable thanks to a combination of analysis of the magnetic image and scattered remains on the surface. These remains suggest that this is another segment of the low wall demarcating the border of the urban development, similar to that of District F, in this context delineating, at least to some extent, the western range of the necropolis. Towards the north, nearer the built-up area of the town, mounds of accumulated pottery sherds (95, 96) on the surface are noticeable.

District H—the necropolis hill

The necropolis hill is situated outside the main urban fabric [see ***Fig. 38***], separated from the town by the low mainly rubblework wall built on the slope of the natural rock hill, as confirmed at least for its southern (94) and northern (97) perimeters [***Fig. 41***]. The functional identification of this district is attested by cut-in stone caves (98), used as mass graves in the Byzantine period, and a burial chapel (CH1).[57]

The burial chapel (CH1) is located some 110 m to the southeast of the eastern baths (T1), is 9 m × 7.7 m and built with regularly cut stones [***Fig. 42***]. It was excavated in the years 2002–2003

[57] Whether the caves themselves are of older provenance remains an open question. There is a general association of burial *dromoi* with earlier activity (Hellenistic) in this area, but it would require verification. The description of burial sites in the vicinity of the site is offered by (el-Fakharani 1983: 176–178), but not accompanied by a map; cf. Rodziewicz 1990: 63; Babraj and Szymańska 2008a: 15; also Shaalan et al. 2018.



Fig. 41. Fragmentary section of a linear structure (97) running parallel to a rubblework wall delimiting the area of the necropolis on the northern slope of its hill (photo A.B. Kutiak 2019)



Fig. 42. The funerary chapel (CH1) from the south (photo A.B. Kutiak 2019)

and its usage was dated for the period from the 6th until the beginning of the 8th century. Its function has been identified as a family burial chapel (Babraj and Szymańska 2008b: 177–178; see also: Szymańska and Babraj 2003: 48; Szymańska 2004; Szymańska and Babraj 2004: 53). On the top of this hill, within approximately 40 m, east and north of CH1, the remains of seven small, freestanding buildings have been identified, which might have been other burial chapels [***Fig. 43***]. The majority of them are not directionally coordinated with each other (99). The figure estimated above should not be taken even as an approximation of the number of burial chapels or tombs that once existed on the hill. Most of the surface of the relatively flat top of this hill consists of bare rock and any building material could have been easily removed and reclaimed leaving only few remnants. The functional coherence of the T-shaped wall in District G with the necropolis is also a possibility.

One of the structures detected during the 2019 survey on the eastern slope of the hill contains an apsis (100) and rubblework walls. It was at first taken for another funerary chapel. However, during the excavations carried out in 2020, it was revealed that these are the remains of a church with a baptistery, secondarily incorporated no earlier than in the second half of the 6th century in the southern wing of a spacious (24.5 m × 24.5 m) free-standing house with an inner courtyard (CH2) (Derda, Gwiazda, and Burdajewicz 2023). The complex was located outside the main urban tissue behind the necropolis hill, does not fit any grid and is somewhat isolated. It is nevertheless not far away from the densely built area of District I and relatively close to the beginning of the causeway leading to the island. Therefore, in terms of its function in the later 6th and 7th centuries, this complex was collaterally located but should not be seen as completely remote.



Fig. 43. Remains of several small, freestanding buildings, possibly of funerary function, on the plateau of the necropolis hill (photo A.B. Kutiak 2019)

For further studies, the anthropological material obtained from the well-preserved burials in the graves will be an important source of the information about the inhabitants of Philoxenite. As for the reconstruction of the ancient landscape, the hill was barely visible from the town, as it was hidden by the relative high complex of the eastern baths (T1), but for an incomer arriving from the southeast, it—if indeed crowned with several free standing burial chapels—might have been one of the most characteristic elements of the townscape.

District I—between the eastern baths (T1) and the onset of the causeway (P4)

The district stretches from the eastern baths (T1) to the base of the causeway (P4) leading to the island northeast of the peninsula [see ***Fig. 38***]. It was somewhat hidden behind the complex of the eastern baths (T1) and located outside the main communications axis of the town. The approximate extension of the line of the wall (97) between the built-up area of District I and the necropolis seems to be the border of the main urbanised area. Its eastern border, like the lakeshore outline in Byzantine times, is still unresolved. The change in direction of the shore wall by 30° from the line in District B, north of the eastern baths, might have its continuation in this district, as the magnetic survey suggests (101). The time of the construction of the causeway has been estimated at the 1st–3rd centuries AD, according to findings at its southernmost point (Pichot 2010: 58; 2012: 98). Its exact role, building history, and functional importance of the island itself during the Byzantine period remains unclear,[58] except for lime kilns operating in the 6th–7th centuries AD (Pichot, Boussac, and Wuttmann 2014: 168). Functioning as a breakwater, and probably also as a pier, the causeway (P4) enclosed the eastern harbour basin. The structures of the large Roman estate with its pier (P5) were at least to some extent in use in Philoxenite times, whilst the Hellenistic tower houses were abandoned and remained in ruins (Pichot 2014; Pichot, Boussac, and Wuttmann 2014: 168).

The survey of remains on the surface was difficult, especially in the western part of the district, because the stone debris obscure the courses of walls [***Fig. 44***]. The general rendering of the structure characteristics within this district will thus be very brief. The structures follow a direction different from any other in the urban area, deviating from the direction of the baths by roughly 10°, following the direction of the wall delimiting the town area (97) at the northern slope of the necropolis hill. The southern shore of the lake between its embankment at the baths and the causeway was probably also set in this direction. Rubblework plays an important role in the building technique, but there are also brick constructions (in the context of water facilities and ovens); some of the identified structures were made of ashlar blocks in the manner typical for the main urbanised area. That an apse has also been identified here (facing southeast) (103) means the existence of buildings of more monumental character cannot be excluded. In this district, ashes from the baths were at least partly deposited (Szymańska and Babraj 2008b: 37). Garbage accumulation is also traceable at the base of the causeway [***Fig. 45***], where a significant dump with accumulation of pottery sherds is recognisable on the surface (104) (Pichot 2010: 58–59).

[58] The chronology and phasing of the causeway was not possible to be clarified in the current survey. El-Fakharani conducted his survey when the water level was much lower in comparison to the level at the beginning of 2020s and also much lower than the Byzantine period. He suggests a building history of this causeway with at least two phases: in the first phase, the so called "lighthouse" island was supposed to connect to the promontory of the peninsula in the shortest possible way but later removed when the southern branch of the causeway was constructed. This assumption must be viewed as highly hypothetical; see el-Fakharani 1983: 181–182, repeated in Haggag 2010: 49–51.



Fig. 44. General view of District I, facing the northeast. This area was dominated by rubblework structures (photo A.B. Kutiak 2019)



Fig. 45. The ashlar structure of the causeway exposed at area F1 (photo A.B. Kutiak 2019)

District J—shore infrastructure west from the main urbanised area

After the southeastern districts of the town, somewhat peripheral to the main urban fabric, the western extremities of the town also require attention [***Fig. 46***]. At the lakeshore, directly west of District D, lower in respect to the level of the corniche (53), a flattened area stretches, where no structures are visible on the surface. It was, however, flanked on the south (W3) and west (107) by buildings constructed according to the best technical standards known from the site [***Figs 47 and 48***]. The limited visibility of remains in the central part of the district might be due to the fact that this area is used by local anglers as a parking ground.



Fig. 46. Plan of districts J and K with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)



Fig. 47. District J as seen from its western border, in the foreground, structure 108, and further on, the mouth of the canal at complex DD1. In the background, the visible prominences of districts E and D (photo A.B. Kutiak 2020)

The main built structures are located in its southern and western parts and are clearly recognisable as the remains of regular buildings constructed with ashlars, possessing solid and rectangular stone paving. These structures can be divided primarily into two complexes: the first one close to the northwestern corner of District E (W3), of dimensions of approximately 60 m × 10 m, but—as can be judged from the magnetic image—at least additionally 12 m wider at its northern side (106) [***Fig. 49***]. In the western part of this district the second complex (DD1) can be easily spotted—its high-quality stone paving is well visible and enclosed by the remnants of ashlar walls not much covered by debris or silt. This complex consists of two buildings (107, 108) erected on a mirror-image plan [see ***Figs 47 and 48***]. They are located on opposite banks of a 5 m wide water canal (109). These twin buildings have courtyards and were functionally bound with the canal and the lake. Their wall lines at the canal side were prolonged to create two short piers of at least 15 m length (110). The side walls of this canal have been identified by Mieczysław Rodziewicz, as quays with moorings (Rodziewicz 2010: Fig. 4).[59]

The context of the buildings within the urban and hydrological structures allows us to assume it was a building dedicated to storage functions and presumably also water management. The canal between the symmetrical building complex is in fact only the first section of the at least 500 m

[59] This structure was excavated by the team from the Boston University, and the mouth of the canal was hypothesised to have been a dockyard (Petruso and Gabel 1982: 11–12), also revealing pottery from the 5th–7th centuries at the mouth of the canal; see also Petruso and Gabel 1983; cf. Sadek 1992: 553 and Haggag 2010: 52–53. The function of this structure in the context of the now recognised water canal, unknown to previous research, requires revision.



Fig. 48. Close-up of the mouth of the canal (DD1, between structures 107 and 108) (photo A.B. Kutiak 2020)



Fig. 49. The area of W3, facing the east. These structures connected the main urban area of the town with complex DD1 (photo A.B. Kutiak 2020)

long waterway running southeast, being the crucial element of an hydrological system of the fields south from the town. Its depth is estimated at approximately 4 m from ground level[60] and its width from 4 to 8 m—it was possible to use it as a navigable route for small vessels (see also Gwiazda, Kotarba-Morley, and Derda 2024). Perhaps there was a bridge over it at its southern part, at the twin-building complex, where buttresses at the western side of the canal are preserved (111). It can be hypothesised that the character of this district, as well as the next one, was not residential but that manufacturing and storage facilities were more predominant here, especially if compared with the lakeshore in districts A and D.[61]

District K—area with manufacturing facilities

In this district we definitely leave the urbanised, densely built-up area of the town. This area cannot, however, be considered as one dominated by agricultural activities, as in the remaining part of the peninsula. District K lacks one general grid and freestanding structures are scattered, but some linear structures and spatial organisation can be recognised [see ***Fig. 46***]. This district can be seen as a backyard either for the eastern side of the town, or for the western complex, namely the grange (V1) and the structures here had a principally utilitarian character. The northern part of the district was functionally connected to the waterfront, as is suggested by a rectangular structure hidden under a mound at the proximity to the lakeshore (112). The function of this structure, possibly more than one-story high, as the amount of accumulated debris and character of the walls suggest, remains unclear [***Fig. 50***]. Its follows the line of an ashlar wall (113) beginning at the grange. This wall at a distance of about 20 m westwards from the structures could have played the role of a shore embankment. These structures might have been part of a wider complex that stretched from the neighbouring District L.

Scattered remains of rubblework structures (115), south and east of the rectangular structure (112) do not allow any functional identification at this stage of the survey. Several linear structures are recognisable on the magnetic image as well as on the land surface (114, 116). In the southernmost part of this district (117) these might be seen as a part of the irrigational system of the agricultural zone, also following the course of one of the probable paths leading to the western part of the peninsula.

The most easily recognisable features of this district are kilns located in its southwestern part (FR1, FR2). Their surroundings are covered with scattered by-products of their activity within an at least 10 m radius [***Fig. 51***]. The western kiln (FR1) was integrated into a structure whose exact limits could not be determined at the current state of research. As the area has not been investigated archaeologically, it is difficult to determine the specifics of their production, but judging from the abundantly scattered material on the surface it can be hypothesised that the kilns were multifunctional.[62] Their locality in the relatively close vicinity of the grange complex (V1) might indicate they were functionally connected with the complex.

[60] Estimations on the basis of the geological drillings conducted by Abdelfattah A. Zalat in the season 2021, see Zalat et al. 2025.

[61] The difference in character of this area was already noticed in Petruso and Gabel 1982: 12.

[62] I am grateful to Alexandra Konstantinidou for this information and preliminary interpretation of the disposable material.



Fig. 50. Close-up of the northern massive ashlar wall of a tower-like structure (112) at the lakeshore (photo A.B. Kutiak 2020)



Fig. 51. Area of District K as seen from behind the eastern kiln (FR2). In the background, on the left side, a mound covering ruins of a structure (112) (photo A.B. Kutiak 2020)

District L—the grange (V1)

Moving westwards along the northern lakeshore, the area starts very slowly to accrue more rural character. In this district, the largest building complex of the peninsula outside the urban area has been identified [*Fig. 52*]. It is a spacious complex, referred to here as the grange (V1), built on a regular plan with courtyards (118, 119), measuring altogether approximately 65 m × 94 m, which totals an area of 6000 m^2. One of its characteristic features is a waterwheel with a water reservoir (SQ3) in its western part [*Fig. 53*]. The quality of the masonry resembles those of the urban districts B and D—the walls were built with ashlar stones and the rooms paved with regular stone slabs.

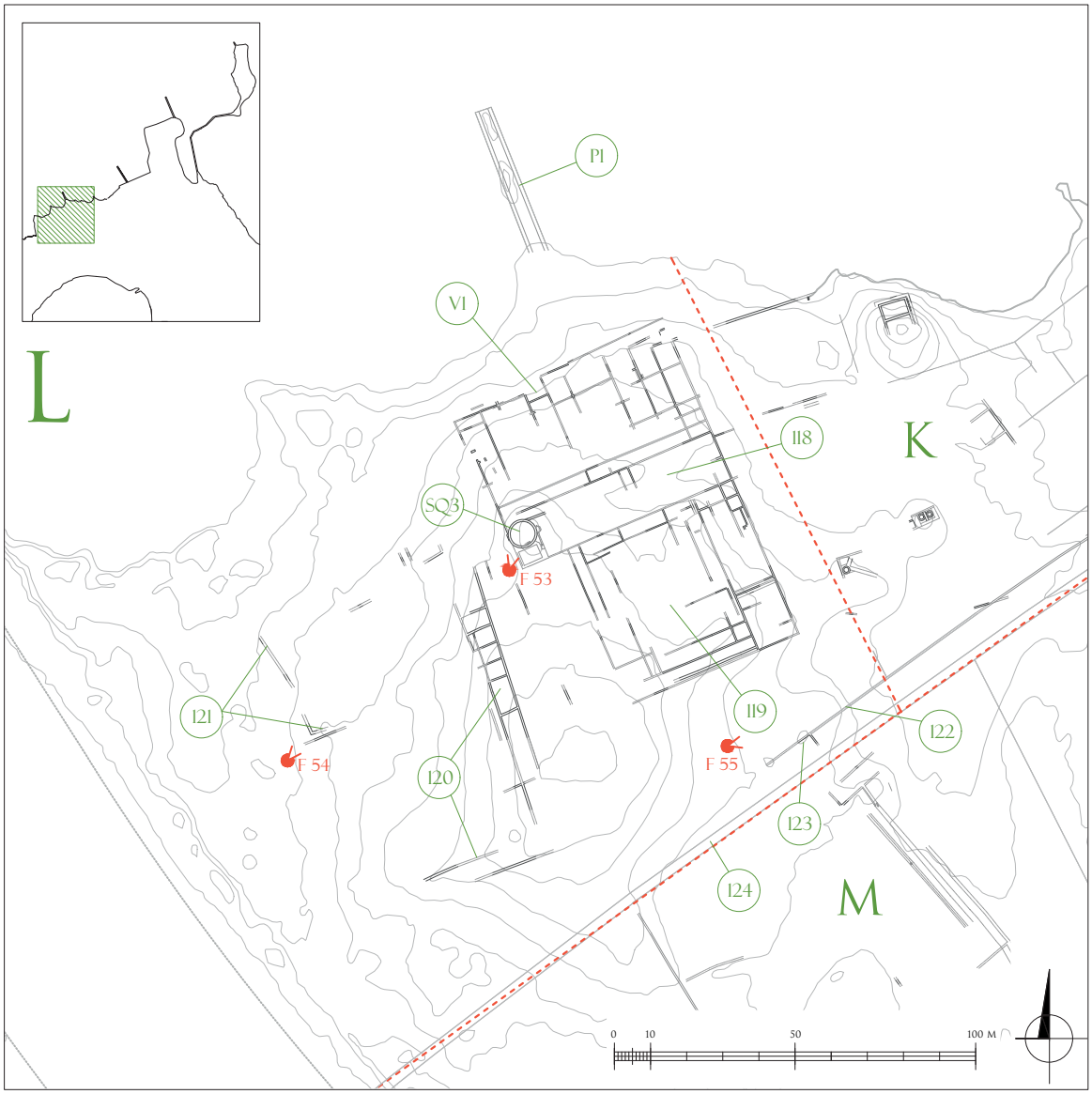


Fig. 52. Plan of District L with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:2000 (drawing A.B. Kutiak)



Fig. 53. The waterwheel (SQ3) of the grange (V1) with the pier (P1) in the background (photo A.B. Kutiak 2020)

The state of preservation of the grange and the fact that it is buried under silt permits no detailed overview. The function or functions of this complex cannot be conclusively stated so far, but a hypothesis can be put forward based primarily on the context. The waterwheel with the reservoir and the fact that many compartments in the northern part of the complex were plastered with a red hydraulic mortar suggest that water might have been involved in the production process. It is also possible baths might have been located here. The elongated section of the complex east of the waterwheel is lowered, suggesting another courtyard (118). In the middle of the southern part, another depression is visible, which might also indicate a further courtyard (119). The outline of the complex reveals its complicated but geometrically based structure and its orientation is consistent with that of District D. Its function is vague and residential use cannot be excluded; it may have served simultaneously as a kind of manorial complex, *villa rustica sui generis*.

Its location allows further speculations: it was not built at the highest point of the hill, but lies northwards, and the summit of this hill is south of the axis of the primary building complex. Such a location gives the complex better access to the lake, which was, at least in the eastern part of this district, furnished with a stone embankment (113), as mentioned above in the description of District K. Almost on the axis of this complex, another pier (P1) is located. It stands out from the remaining two because of its huge ashlars (on average 105 cm × 45 cm × 35 cm), its stepping section, and its height, rising 1.4 m above the current lake water level, which makes it the highest pier on the site; it is also the shortest one at only 43 m in length (Babraj and Szymańska 2013: 192). Its structure also suggests that more than one building campaign contributed to its form.



Fig. 54. Remnants of rubblework structures (121) west of the grange complex (V1) (photo A.B. Kutiak 2020)



Fig. 55. View of the site from the southern part of District L, with the whole area of Philoxenite visible in the background. The plain of the ancient agricultural zone, covering most of the peninsula, is also clearly recognisable (photo A.B. Kutiak 2022)

On the western part of the hill, and south of the main complex, the parent rock is visible on the surface. In this area, further structures (120) have been recognised; they were built in rubblework and not fully parallel in their direction to the main complex (V1). They are poorly preserved: a significant part of these buildings was founded directly on the bedrock and the constructions were stripped, probably to gain building material. The scattered stones are only a small percentage of the amount needed to construct any building of these dimensions. That the structure (120) was a building and not any kind of e.g. fence or wall is evidenced by the preserved architectural elements such as doorjambs. Moving further westwards, other remains of rubblework structures (121) are detectable, which are most probably only the eastern parts of a more extensive complex destroyed during the construction of the highway embankment at the westernmost part of the site [***Fig. 54***].

The amount of silt deposit rises significantly in the southeastern part of the district, where the remains of the irrigation system are also recognisable (122). Directly south of the southeastern corner of the grange (V1), some sections of walls emerge elusively from the silt blown here by the wind. They are scattered amid mounds of ancient waste (123), as the mixture of pottery sherds, ash, bones, oyster and *Hexaplex trunculus* L. shells, signifying a garbage dumb. The traces of a road (124) leading to the southwestern periphery of the peninsula are suggested at the border to the next and last district to be described [***Fig. 55***].

District M—the agricultural area

This last area covers most of the surface of this site—over 30 ha—and conceals the remains of a virtually complete irrigation system [***Fig. 56***]. From the point of view of the research of agricultural practices in the Byzantine Mareotis it is of unprecedented research value. In this strictly delineated [***Fig. 57***] area elements of this irrigation system [***Figs 58 and 59***] so far mapped cannot be taken as a complete recording of its remnants and further investigation of the agricultural area is in progress.[63] Here, only a brief overview of the general characteristics of this complex agricultural area will be presented. It is an important appendix to the description of the urban settlement, as these fields were the nearest to the town and elements of the infrastructure were related and incorporated to the suburban areas, especially of districts J, K, and L.

The irrigation system consists of at least three types of water channels: the largest identified so far has already presented in the description of District J, having a width of 4–8 m and a length of at least 500 m (109). This canal had at least one branch of similar width (128), which led to the waterwheel (SQ5 at V3). The most characteristic features of this district, striking in their clear geometrical outline and uncovered by the magnetic prospection in 2018, should be interpreted as a part of the water infrastructure. These consisted of two square structures (V5, 127) directly south of District J and west of District E, both at the line of the water canal (109) in District J. The western structure (127) as such is not visible on the surface, as this area is currently densely

[63] The magnetic prospection in 2018 by Krzysztof Misiewicz and Wiesław Małkowski was focused on the urban area (see Derda et al. 2021). Since 2021 a dedicated agricultural area magnetic prospection has been conducted by Tomasz Herbich, assisted by Konrad Jurkowski (see Chapter 7). Further prospections on foot were undertaken with Anna-Katharina Rieger in 2022. My sincere thanks for on-going supervision of pottery evidence during the survey to Katarzyna de Lellis-Danys.

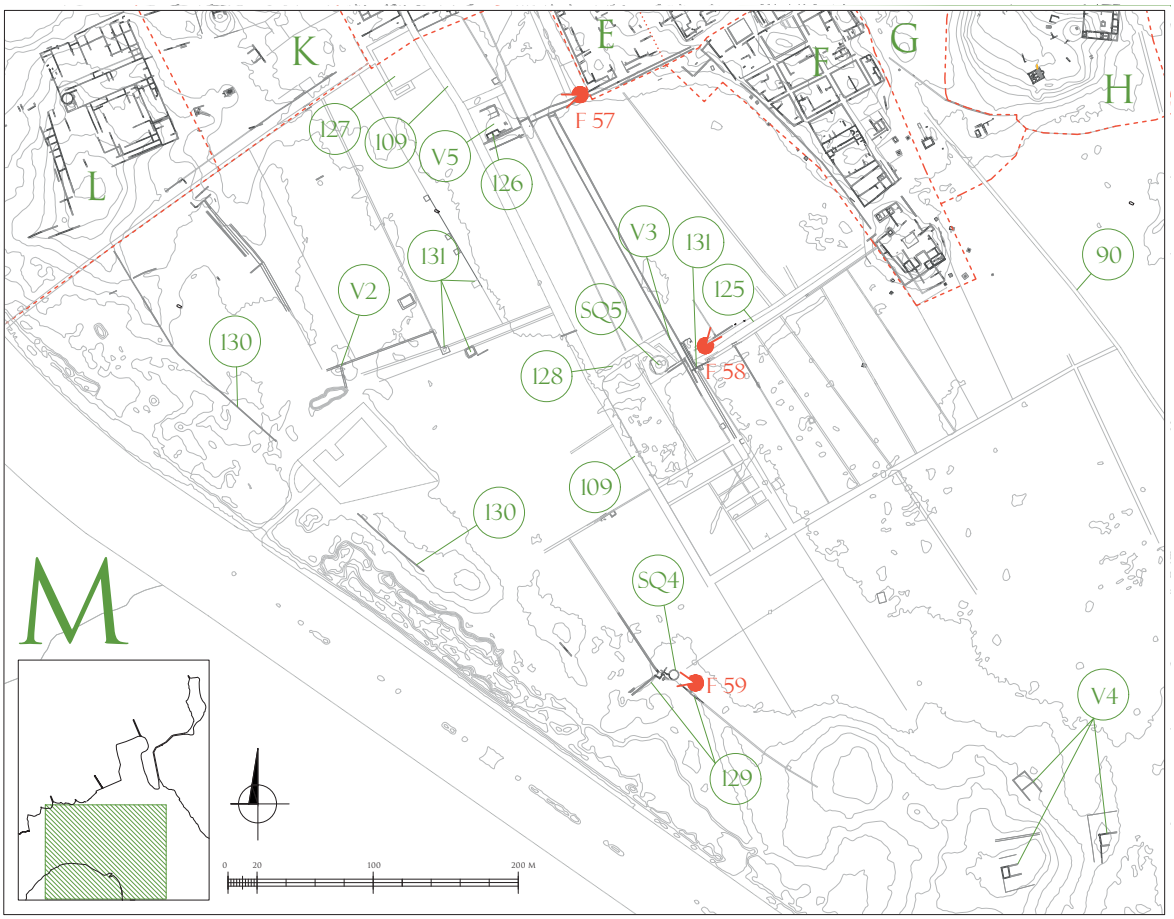


Fig. 56. Plan of District M with numbering of the most important structures. Orange symbols mark viewpoints of the respective photographs. Scale 1:5000 (drawing A.B. Kutiak)

covered with a lush vegetation.[64] In the area enclosed by the southern square structure (V5), documented by the magnetic prospection, remnants of rubblework are visible on the surface (126). In its vicinity, a relatively dense web of smaller irrigation channels is also preserved. Some of them were built with stone flumes, approximately 45 cm × 85 cm × 25 cm in their outer dimensions, rectangular in section, with walls 10 cm thick. Channels of this form (as for example 125) transported water for more than 150 m from the main water canal (109) [see ***Fig. 58***]. Other water channels were brickwork structures, plastered with hydraulic mortar. Within this web a set of small structures (about 3.5 m × 3.5 m) (131) made of rubblework are noteworthy, now mostly disintegrated, but in their geometrical relation fitting in the outline of the system. They can be seen as remains of water distributing basins, such as known from the contemporaneous archaeological site "Akadémia", east from the peninsula of Philoxenite.[65] Water was eventually led to the earth channels, irrigating the fields under cultivation.

[64] The vegetation density of the site has significantly risen between 2010 and 2022.

[65] Nenna 2015: 277–281. The excavated elements of the system have been dated to the 6th–7th century AD, and are therefore contemporaneous with the site in focus.



Fig. 57. In the northern part of District M, a linear structure was identified, possibly a *plaste*. In the background, the hill with the grange (V1) and the mound (112) in District K (photo A.B. Kutiak 2020)

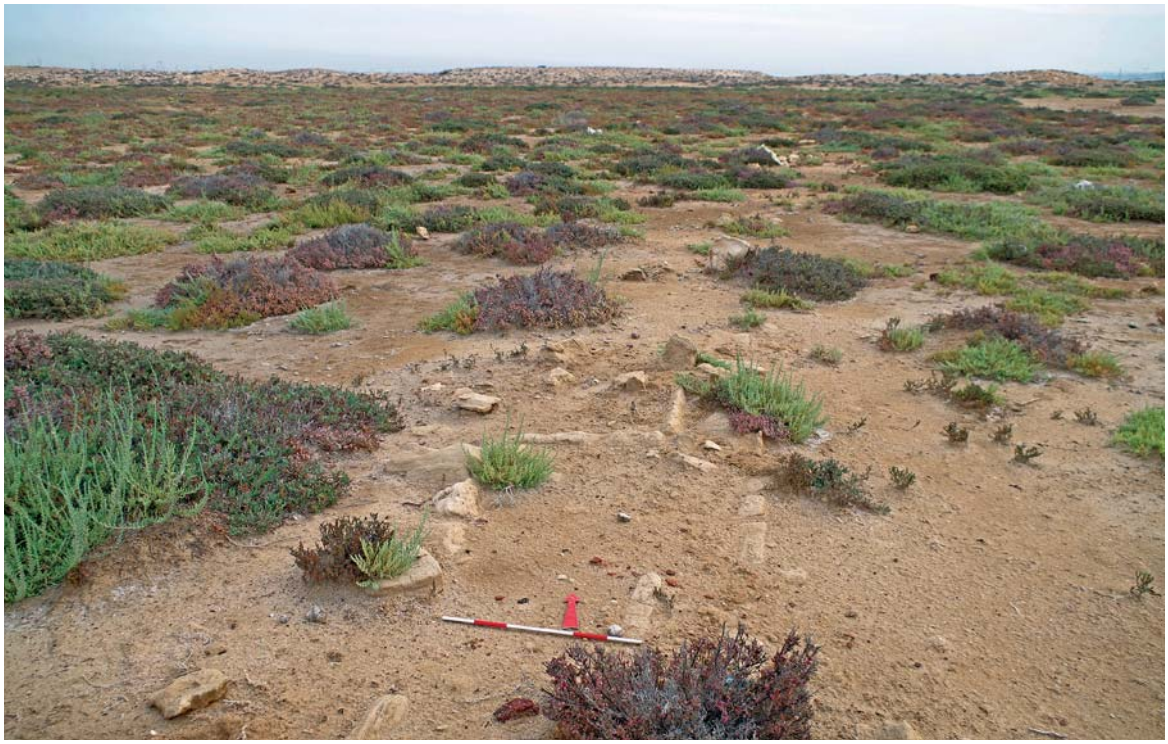


Fig. 58. One of many channels once irrigating the agricultural area, here in the central part of District M (125). In the background, the elevated area of districts E and F is noticeable (photo A.B. Kutiak 2019)



Fig. 59. The area of the southernmost recognised waterwheel (SQ4) with surrounding hydraulic infrastructure (129) (photo A.B. Kutiak 2020)

One more important element of the hydrological system should be mentioned: the waterwheels. They were already described in the urban context, especially as supplying water for the two baths complexes (T1 and T2). The largest one so far known on the site, with a diameter of almost 12 m, occupied a central place in the agricultural area (SQ5), midway between District F and the southern coast of the peninsula.[66] At the southern lakeshore, a further waterwheel (SQ4) complex has been identified, which consists of a brick basin covered with hydraulic mortar, several further structures, among them channels (129), as well as a stone circular structure, which delimited the area of the animal driving the waterwheel [see ***Fig. 59***]. A significant part of this complex is a promontory projecting south into the depressed area, which was just a bay of the lake before the construction of the modern highway. The promontory is combined with the waterwheel complex and seems not to be of natural but rather of anthropogenic origin.

In this vast area, not only are elements of hydraulic system traceable, on the southern part of the site, a long linear structure [see ***Fig. 57***] has been detected, i.a. (130). The direction of this probable stone fence continues approximately 80 m, cutting through the area of the modern storage museum, then deviating northwards, heading toward the structures in the vicinity of the grange (V1). The complete course of this wall (another *plaste*?) has not been identified so far.

Habitation in the Byzantine period was not limited to the northern shore of the peninsula. Approximately 330 m in a southerly direction from the most southernmost part of District F,

[66] It was located thanks to the magnetic prospection in 2021. The area of the waterwheel was identified together with an eastern branch of the water canal connected with the lake.

on the top of the hills, further structures have been located (V4). These buildings were constructed with ashlar stones and rubblework, and some of them are only barely traceable thanks to the differences in the vegetation and surface characteristics, so only the general contour of this complex has been delineated. Their exact extent remains unknown.

Apart from the last buildings on the southern hills, the linear structures, the main channels, possibly also roads, were based, especially in the central part of the site, primarily on the same directions as the urban pattern of District F. This coherency of the master plan of the area allows us to speculate about the interplay of the outlines of the rural and urban area, which will be discussed in the part dedicated to the chronological aspect of the settlement.

The main source of the fresh water for the agricultural activities on the site in the Byzantine period is an important environmental aspect to be investigated. That the extensive web of channels was connected with the waterwheel (SQ5) located at the branch of the main canal (109), filled with fresh water from the lake, seems, however, beyond dispute.

Urban analyses

The current state of the investigation does not allow us to present a complete street grid of Philoxenite and the detailed hierarchy and function of all the urban spaces. Most of the site, and many crucial points important for understanding its urban structure, are still prior to archaeological investigation. However, the survey of the structures visible on the surface presented above means the main outlines and the specifics of the urban plan can already be discussed at a certain level of generalisation, touching on the mutual relations and context of the architectural features of the buildings making up the urban fabric. Above all, we are dealing here with an example of extensive urban planning and its subsequent realisation. Some pre-existing structures and the topography had been taken into account by the planners and they influenced the shape of the newly designed town, but novel geometrical principles are predominant.

Urban grids and their modularity

The vast majority of the urban settlement, with very few exceptions, was built according to an extensive master plan: districts A, B, C, and partly E, J, and L share several common features based on geometrical principles, which allow us to hypothesise about their establishment during one planning phase. This need not mean a single building phase, as the planning of the town outline does not equal the delimiting time of all the planned urban area, let alone the time needed for the construction of all the buildings. It should be also mentioned that the known from the site building techniques can be hypothetically seen in the context of the chronology of the settlement and where the rubblework technique could be seen as a predominant in the later extension stage. This hypothesis finds also supporting evidence in the types used grids for the urban planning as presented below. The dispersal of each building technique within the site is depicted in ***Fig. 60***.

In fact, the abovementioned districts of the northern part of the site were based on a rectilinear grid, whose primary unit can be reconstructed as being a square of 16 × 16 Byzantine feet (*podes*) (1 foot—*pous* [πούς]—will be adopted as the equivalent of 30.8 cm for the purposes of this

analyses).[67] Several directions of the grid can be identified: that of basilica or the A-grid (the specific grids will be referred further under the names of the relevant districts; the overview of the grids is presented in ***Fig. 61***), the complex of the great basilica (B1) and adjacent *insulae* at the very northern part of the promontory is based on this axis, deviating approximately 21° from the north (derivation westwards; eastward derivation will be denoted with the minus sign). The northern waterfront (retaining wall) of District A, in its middle section, also follows this direction. District D runs in a similar direction on the grid, which was based on an almost 24° deviation from the north. The grange (V1) with deviation of 23° is surprisingly near to the grid direction at the basilica, but this may have been coincidental and caused by the course of the coastline. The complex at the mouth of the canal (DD1) with the strongest deviation, a little over 27°, falls also into this main group of grids [***Figs 61 and 62***]. The directions of grids seem to have been adjusted in an attempt to use the space of this irregularly shaped peninsula efficiently.

However, the axis of the great basilica (B1) and therefore of the urban grid in District A had already been settled before the major planning works: it follows the axis of the older basilica (B2) and its complex, which was demolished to make space for the newer one. Taking into account the topography of the peninsula itself—the axis of basilica complex as well as the eastern part of the head of the promontory—the grid was aligned to the shape of the peninsula in its middle and eastern part. The directions of the structures from the Roman period, as known from the layers under H1 do not follow this direction (Gwiazda and Wielgosz-Rondolino 2019: 261–264).

The urban layout of District A is, however, not homogeneous. At the border between the western side of atrium and the dense urban fabric in the western part of this district (22, 23), the direction of grid changes to one deviating approximately 14° from the north, so the deviation is little over 7° between this western part and the *insula* of the basilica. The grid of the western part of District A continues in the western area of District C, along the waterfront line (52) and the northern corniche with the latrines (L4) further south to the square (A3) and eastern part of District E (68). In the buildings in this area there are noticeable tendencies to mingle the directions of districts C and B, as for example in the complexes (43, 45) where meridian walls are aligned with the B-direction and the latitudinal with the C/west-A-direction. This mingling procedure is also visible in the eastern part of District D. The mill building (M1) was constructed outside of these two directions, with deviation of 9°45' from the north. The source of this deviation, also in the context of the exceptional building technique of the mill, might be due to the chronology of these structures: if the building was constructed in one building campaign, together with the rest of the neighbourhood, they would have stuck to one direction, unless there were changes forced by the topography, which is very even in this area. The C-grid is in principle near to the alignment of the grid in District B, which deviates by 11°35' from the north. This allowed a more efficient use the space, as the C and B grids are parallel to the lakeshores, west and east of the promontory, respectively. Their directions were then seemingly derived from the direction of peninsula itself. The same direction as in District B was used to delineate the causeway (P4), leading to the island, at least for its first 300 m. This coherence of the axis of the *odos* and the causeway—which was dated to the 1st–2nd centuries AD (Pichot 2010: 58; 2012: 98)—provokes questions about its

[67] This unit was already identified at this site at architectural scale by Jacek Kościuk (2012: 37), with further references.



Fig. 60. Dispersion of two main wall construction types on the site. Scale 1:7500 (drawing A.B. Kutiak)

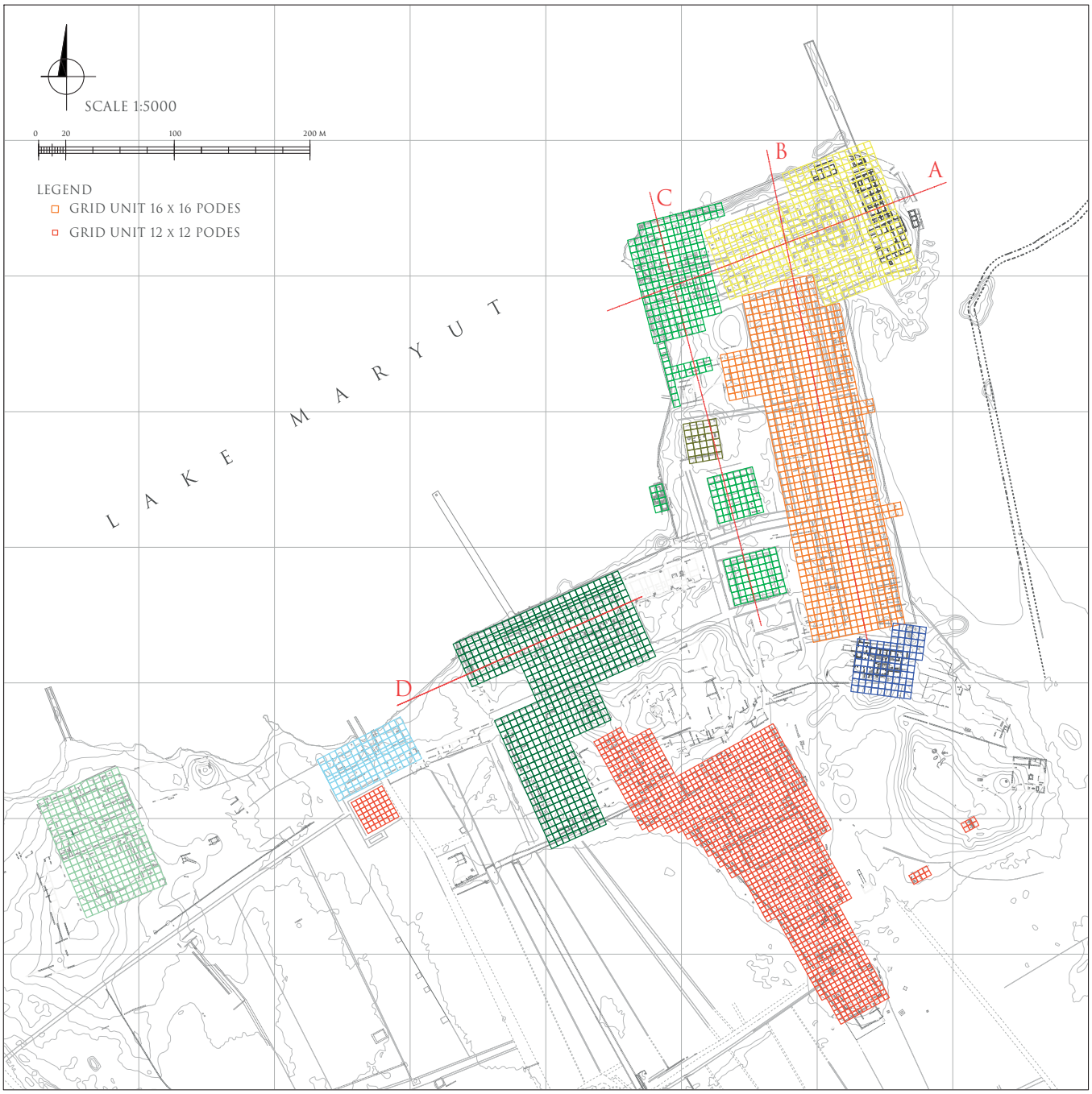


Fig. 61. The main urban-architectural grid used for designing Philoxenite can be identified as being of 16 × 16 *podes*, but its exact alignment differs within the site. The grid is here schematically depicted only in areas where sufficient data exist to identify the main axes of the structures. The four main axes A–D are also marked. Scale 1:5000 (drawing A.B. Kutiak)

proper phasing. However, the planning practice of referring to existing structures during the Byzantine building campaign cannot be ruled out. The existence of a further, older, Roman outline in this area also cannot be excluded, such as a purely hypothetical road parallel to the causeway leading to the kilns at the northern promontory, which direction would have been incorporated into the later urban grid. The much narrower streets are perpendicular to the *odos*, with the exception of the street directly south of the *insula* of basilica (B1), as it follows the axis of the sacral complex. Based on the magnetic image and scattered remains accessible to the survey, the sections of the next two southern streets in their western parts do not consistently follow their primary perpendicularity in respect to the *odos*. This deviation is caused by the different direction of the urban structure at the western part of the promontory where the C-grid dominates—with the mentioned exception of the mill (M1). Reaching the square (A3), the next street to the south changes direction on its western part, as it was united with the extension of the waterfront and the corniche of District D based on another grid.

The alignment of the grid in District D can be seen as another attempt to use the space efficiently by aligning the grid parallel to the lakeshore. It is however near to the direction of the axis of basilica (B1), with a deviation of only 3° for the baths (T2); this cannot be merely coincidental in the case of urban complexes planned in a short span of time. The transition between the rectilinear grids is seen between districts D and C, where the line of the waterfront (58, 59) was integrated in the layout of the streets with the possible aim of creating even street lines and urban spaces (such as the street between districts C, D and the square [A3]) with the detriment to the regularity of *insulae*, which became more trapezoid (especially visible in the plan of the commercial buildings [W2]). It can be treated as evidence for prioritizing the public space in urban planning.

However, not every urban junction allows us to draw such straightforward conclusions. The eastern baths (T1) and waterwheel (SQ1) complex, by contrast, lie outside of the mentioned grids. The discrepancy of the direction of the eastern baths (T1) (–7°19' from the north), not only in the context of the main grid of District B, but also of the neighbouring District I cannot be explained by the landform, as it is quite even at this part of the town. The city designers were not willing to significantly change the angle of grids according to the topography in the middle of urban fabric, except in places with significant differences in height (such as District E, located on a hill) or where they decided to follow the course of the coastline. Another explanation can be found in the relative chronology of the town. The fact that one of the regular *insulae* at the *odos* took the shape of a trapezoid to follow the line of the

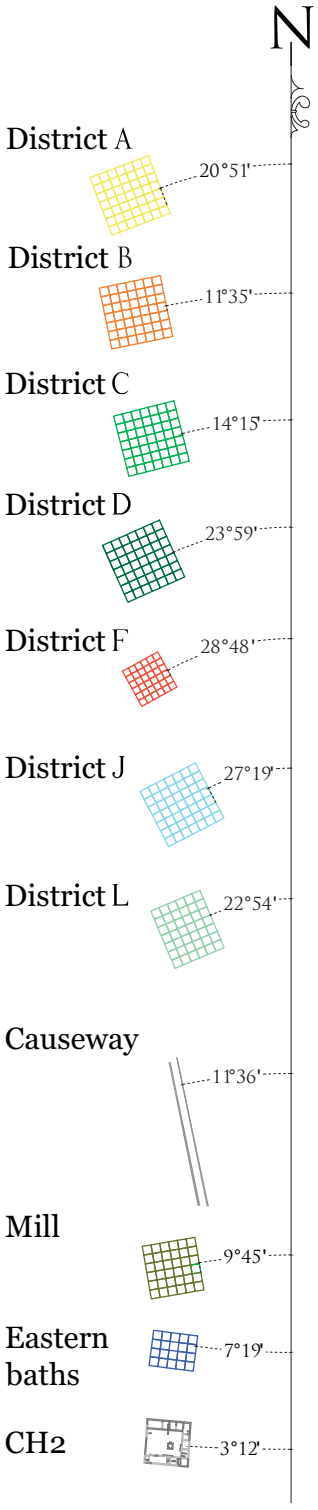


Fig. 62. Comparison of the grids and axes of significant structures identified on the site with regard to their deviation from due North. Scale 1:5000 (drawing A.B. Kutiak)

thermal complex (T1), which on its own does not exhibit any distortions of its rectangular plan, supports the hypothesis that these baths were established earlier than the urban fabric and before the *odos* with its *insulae* was staked out.

Behind the baths (T1), in the proximity of the necropolis hill, District I was dominated by structures planned in the direction deviating –23°39' from the north. This direction fits neither into the axis of the baths (T1) nor into other grids. The exact urban situation in this district remains enigmatic and does not allow us to present any further generalisations here. Topographically, this district was restricted from the north by the lake, from the south by the hill of the necropolis and from the east by the onset of the causeway.

The necropolis of Philoxenite, as far as can be understood from the preserved remains, was a complex of freestanding burial chapels and underground tombs, adhering mainly to the topography of the hill. Interestingly, the burial chapel (CH1) follows the direction known from District F. The largest complex of this peculiar district so far known is the house with a church and baptistry constructed in the second phase of its existence (CH2). Its direction is similar to the direction of the baths (T1), with a deviation of 3°20', but this may be purely coincidental.

District E is the most complicated in the terms of variety of architectural plans and building techniques. As already mentioned in the description of this district, it can be divided into three parts: the eastern, which is nearest in its formal aspect and mostly coherent with the C-grid; the middle part with complicated topography and multiple deviations in the direction of the wall; and the western part, consistent in principle arrangement with District D but different in building technique. In the middle part of District E, some structures are formally and functionally bound with District D, as is the waterwheel (SQ2) and water basins (70) which supplied the bath complex. It is most probable that this infrastructure was planned and constructed together with the western baths (T2). The structures covering the hill in the central part of the district needed to respect the topography, but they also seem not to be a one-time building investment, being an area of more complicated chronology. In contrast to the central part, the western was localised on practically flat area, which had been planned and realised, at least in its peripheral part, based on one consistent plan. This clearly rectangular complex (92 m × 60 m) is highly visible in both the magnetic and hypsometric image of the site (73, 75), with the clearest urban boundary of the whole town. This geometry was also consistent with the principal outlines of the irrigational system in the northwestern part of District M. The spatial and formal relation is clear but needs further archaeological investigation.

In geometrical relation with the grids of districts A and D is the symmetrical complex (DD1) at the mouth of the canal (109) at District J, changed by 3° in comparison to the D-grid. At a distance of 270 m from the western border of the main urbanised area, the grange (V1) in District L is also related to the urban grids, as the deviation of the meridian walls in relation to the two districts (A and D) of the core urban fabric is by only 2° and 1°, respectively. This direction is also noticeable, but not as consistent, for the linear structures in the agricultural area. Whether they were planned together, or one was derived from another, may be explained in the upcoming research. That these satellite complexes of the town were based in principle on the same modular grid might be demonstrated by the geometrical analyses: the width of the canal between the buildings (107 and 108 of complex DD1) is the same as the primary width of a street in District B, being 16 *podes*, and the outer perimeter of the building can be framed by a square 80 × 80 *podes*

and the complex of the grange (V1) in a rectangle of 208 × 304 *podes*, so functioning as multiplication of primary unit of 16 *podes*.

The last urban area which can be analysed in the context of the urban grid is District F, creating an elongated salient of the urban tissue, which runs 330 m into the agricultural area, being on average 70 m wide. It should also be pointed out here once more that this peculiar form was not forced, or directly induced by the geological features of the land, as evidenced by the archaeological survey (Gwiazda, Derda, and Barański 2022: 356–366). The direction of axes of its walls is of an approximate deviation of 29° from the north. This direction was followed with smaller deviations by the structures in District G (M2, F3) and also, as already mentioned, the burial chapel (CH1). Leaving aside the functional aspect of these structures, their grid and its modules do not follow the planning patterns of the rest of the town. The magnetic prospection combined with the architectural survey allows us to depict the structures especially at the northern, although also in a wider part of this district, as having been built based on a regular grid; the district does not, however, follow the 16 × 16 *podes* pattern but can be framed by a grid in a module of 12 × 12 *podes*. So, the unique character of this district lies beyond its place in the topography of the town, in its building technique, spatial relations of the structures, and also in the different geometrical patterns.

Urban and architectural modules

The mentioned urban grids with their modules of 16 × 16 and 12 × 12 *podes* could, hypothetically, also be followed on the architectural scale. It must, however, be stated that the deformation of the buildings—those intended and those resulting from the deviations during staking out and posterior distortions—allow only limited discussion in these metrological analyses. As was already observed for House H1 (Kościuk 2012: 34–37) and described above for the urban scale, further building elements of a grid system can be traced. As already mentioned, the primary width of a street was 16 *podes*, being the primary module of the grid. The *odos* was designed to be in a range four to five times wider,[68] the two northern *insulae* had a length of 16 modules, the southern 17, and the square (A3) is 8 × 7 modules.

The first module of 16 × 16 *podes* is to be found in various structures, starting with the basilica (B1), where the width of the corpus is 5 modules and the length 10 modules; in the western baths (T2) the frigidarium would have been enclosed by a perimeter of 5 × 5 modules; the mentioned complex at the mouth of the canal 5 × 5 modules (DD1); and the grange (V1) 13 × 19 modules. The commercial buildings (W2), east of the baths, were built on basis of a repeated plan, whose primary unit was 3 × 3.5 modules, and the core of the eastern *insulae* at the *odos* have a depth of 2 modules.

This enumeration is an argument that the town was coherently designed on both the urban and architectural scale. It supports the thesis that it was a realisation of an extensive and systematic investment. The planning enterprise required precise recognition of the features of the land foreseen as the location of the town, involving the mapping of its features, as well as being sufficiently well organised to stake out new urban fabric with all its infrastructure on a large scale. Further

[68] The western line of the frontage of *odos* was not excavated; the estimation is based only on the magnetic image.

metrological studies of the architecture would step outside the urban-planning focus of this chapter but this will perhaps contribute in future to describing and understanding more precisely the techniques of Byzantine architectural and urban planning used for Philoxenite.

Orientation of churches

In the context of planning and geometrical characteristics, one more aspect deserves at least short description: namely, the orientation of churches in Philoxenite and in the region. The problem of setting the direction of ancient Christian churches has been already widely discussed in the Mediterranean context (e.g. Dallas 2018). The practice of setting the sanctuary apses of churches in an east-facing direction was predominant, and was from about the mid-4th century onwards customary in the Eastern Roman Empire. Such churches earned the epithet "oriented".

The churches and chapels of Philoxenite, not only those within the urban grid, as in the case of the basilica (B2 and followed by B1) and the burial chapel (CH1) of the necropolis, exhibit a very similar deviation from the axis east-west towards the north when their configurations are compared. This can be treated as a deliberate decision, especially when the buildings were erected outside of an urban context. Only the church in CH2 does not follow this direction, but here the sacral context is posterior to the architectural structure of the building and its orientation did not play a role at the time of its construction. This deviation is evident in other churches and is predominant and relatively homogeneous in the whole region—for instance, the churches of Sidi Mahmoud, Karm aš-Šuwaīlhy/Tal el-Shwelhy, or the peristyle complex of Hawwārīya, not omitting the great basilica of Abu Mena. In order to obtain a more accurate picture of these deductions, the orientation of the aforementioned scattered structures should be verified.

However, with the current state of knowledge it is possible to draw the following conclusions from the known churches of this region, it can be state that the churches in the Mareotis region were predominantly planned to point northeast. This deviation might pertain to a connection with an astronomical alignment to some significant solar date, such as the time of the rising sun during the winter solstice or at the equinox, but might also have been not astronomically but geographically defined: the line connecting Mareotis and Jerusalem deviates by approximately 10° from due East. Whether the deviation of the orientation of churches is due to the fact that in summer at this latitude the Sun rises in the northeast or as a gesture of piety towards Jerusalem requires further studies.

Recapitulation

This deliberately and carefully planned town was a busy place, located at the crossroads of pilgrims and goods travelling to and from Alexandria and from that city also to more distant destinations. Consequently, from the very beginning its buildings and urban spaces were subjected to changes and extensions and its features should be seen as a development through time, as this settlement is not a single-phase one. The modifications and expansions of building were in most known cases realised in other techniques than the initial use of cut stones. Later, cheaper rubble material was preferred. If this is also the case on the urban scale, the western part of District E, the majority of

District I and the peculiar salient of the urban fabric, District F, were effects of the expansion of the town outside its erstwhile settled urban frames, albeit the chronological interval might have been very short, or the result of contiguous development. This would not have been an act of an uncontrolled sprawl but a continuation of the idea of planned urban space realised in different form and different—more affordable—building techniques. Additionally, the influence of different functions and different benefactors on the building form cannot be excluded.

This urban undertaking allowed its planners in Late Antiquity to present their mastery of urban design via the geometrical characteristics of the urban layout efficiently adjusted to the topography; its modular planning methods; the rich repertoire of urban forms (grand streets, corniches, squares) and ability to connect them; and last but not least, the technological and engineering prowess evident in the harbour infrastructure, water and sewage management. It was also a town without defensive walls, open to and connected with its agricultural vicinity, apparently erected in times of stability and prosperity in the region. It earns praise as an ambitious urban and architectural undertaking and can justifiably be called the swan song of Antique urban planning (Gwiazda and Derda 2021). It stands in contrast to Abu Mena, where the urban outline was an effect of gradual extension and agglomeration of complexes serving different functions and answering growing needs, and which were subjected in urban terms to the axis of the main *odos*, where one direction and width are never longer than a distance of 100 m.

The latest stages of occupation within the town can be dated to around the middle of the 8th century. In the short term the lively urban organism of Philoxenite was forsaken. New investments and the refurbishment of existing structures had a definitive end, in which the twilight of power of urban administration coincides with a slowing of the economy and environmental changes, leading in the longer term to collapse of the whole region. Any need for construction was reduced to a minimum as the space was gradually degraded after its abandonment. The majority of vacated buildings were an open invitation for looters not for new inhabitants, who were neither willing nor capable of redeveloping a town sinking into oblivion.

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Chapter Seven

NON-INVASIVE RESEARCH OF PHILOXENITE AND ITS AGRICULTURAL HINTERLAND

Tomasz Herbich, Krzysztof Misiewicz

Introduction

Geophysical methods were applied at the site of Philoxenite to determine the extent and layout of the urban area, a task too costly and laborious to carry out with traditional archaeological methods (Derda et al. 2021). Of the three geophysical methods commonly used in archaeology—magnetic, electrical resistance and ground-penetrating radar—magnetic prospection was the method of choice in this case. Its advantage lies in the relatively short time needed to cover a large area: half a day to two days, depending on the measurement technique, for one hectare of land. The electrical resistance method is at a disadvantage when surveying large areas because without proper humidity—and the ground at the site is overly dry in the summer and autumn, that is, during the fieldwork seasons—contact between the probes and the ground is poor and slows down the work. The other difficulty limiting the possibility of wider application of this method may also be the strong salinization of the near-surface layers. It can also reduce apparent resistivity values, limiting the correct determination of the natural resistance of individual layers, and thus also their actual thickness and the depth of the structures that are the source of the observed changes in resistivity values. However, research using this method is possible in limited areas and may bring useful information, as evidenced by the results published in 2021 (Derda et al. 2021: 127–129) or obtained at another site on the Mediterranean coast—in Pelusium (Herbich 2020). As for ground-penetrating radar, which is the most efficient method for tracing remains of brick and stone architecture at shallow depths, its application at Philoxenite is impeded by the stone debris scattered on the surface, constituting an obstacle for either wheels or runners for moving the antenna. In addition, the magnetic method has already yielded results from prospections carried out on the fringes of the site as well as on several sites in the close vicinity (not more than 20 km), which are situated in a similar environment, were developed at more or less the same time and were built up with architecture using similar building materials (Boussac 2007; Pichot 2010; Redon et al. 2020).

Another non-invasive survey method used at Philoxenite is digital terrain modelling (DTM) of the site surface. The substantial hypsometric diversity of the terrain is evident even at first glance. Several small hills with a relative height of 5–7 m, extending over an area of up to several hundred square meters, are characterized by an asymmetry of the slopes and evident flattening in places. The likelihood that they are the result of human activity is considerable, especially as their surface is covered with potsherds and architectural stone rubble, which is not recorded elsewhere.

The prospection was carried out by two different teams working within the frame of the same research project, Krzysztof Misiewicz and Wiesław Małkowski (Faculty of Archaeology, University of Warsaw) and Tomasz Herbich (Institute of Archaeology and Ethnology of the Polish Academy



Fig. 1. Location of the magnetic surveys superimposed on the Philoxenite map. 1. Caesium magnetometer survey, 2. fluxgate gradiometer survey (drawing A.B. Kutiak)

of Sciences [IAE PAS]) with Konrad Jurkowski (Institute of Archaeology, Jagiellonian University). The University of Warsaw team working in the 2018 and 2019 seasons used a caesium magnetometer and prepared the DEM model. The team from IAE PAS, which surveyed in 2021 and 2022, was equipped with a fluxgate gradiometer. The caesium magnetometer was used in surveying the area of the town and the adjoining terrain to the west, whereas the low-lying areas on the southern and southwestern side of the town were prospected with the fluxgate instrument [***Fig. 1***].

Geophysical surveys around Lake Mariout

Based on publications, the only geophysical surveys that have ever been conducted around Lake Mariout were carried out using the magnetic method. The first magnetic prospection at the site of Philoxenite, conducted in 2004–2005, covered a part of an island located northeast of the town [see ***Fig. 1***]. Remains of stone architecture built with locally quarried limestone were discovered at the time (Herbich 2005; Pichot 2010). Limestone is characterized by very low magnetic susceptibility, but the higher susceptibility of the fill within the ancient structures enabled tracing of the layout of buildings: the walls were mapped as negative anomalies, reflecting the difference in magnetic field intensity between architectural remains (lower values) and the surroundings (higher values) [***Fig. 2, left***]. This phenomenon was attributed, at first, to the industrial character of the area on the peninsula, such as metal processing among others, which mass-produced enough ash and slag to effectively raise the overall magnetic susceptibility of accompanying strata. However, measurement of magnetic susceptibility at the Kom Bahig site south of the Lake Mariout, preceding the prospection, demonstrated a similarly higher magnetic susceptibility of soils covering the limestone ridges and bars around the lake (Nenna 2016). The magnetic properties of these soils can be explained by their source and the chemical processes taking place in them. The formation of these soils is due to the deposition of aeolian dust in a process corresponding to a distinct drying of the climate in the central Sahara. The deposition occurred at the point of contact of dry masses of air from the Sahara and the humid masses coming in from the Mediterranean Sea (Mycielska-Dowgiałło and Woronko 2008; Woronko 2012). The highly fertile soil environment (demonstrated by the study) was conducive to processes leading to the transformation of iron oxides in the soil into oxides with high magnetic susceptibility. These processes, caused by bacteria, were observed in research aimed at explaining the higher magnetic susceptibility of topsoil layers in Europe in areas with no traces of human activity (Fassbinder and Stanjek 1993). Higher magnetic susceptibility could also be the result of anthropogenic activity—a fire, for example (Fassbinder 2017).

The prospection at Kom Bahig yielded similar results to Philoxenite, that is, stone structures registered as negative anomalies (Nenna 2016). The long higher-value anomalies separating various building complexes were interpreted as images of streets (Herbich 2017) [***Fig. 2, right***]. Observations on the imaging of stone structures in the specific conditions of the Mareotic ridge were repeated and confirmed at other sites in the region: at Plinthine (Herbich 2015) and Taposiris Magna (Boussac 2007). Similarly to Kom Bahig, the surveys at other sites also recorded sections of the street grid.

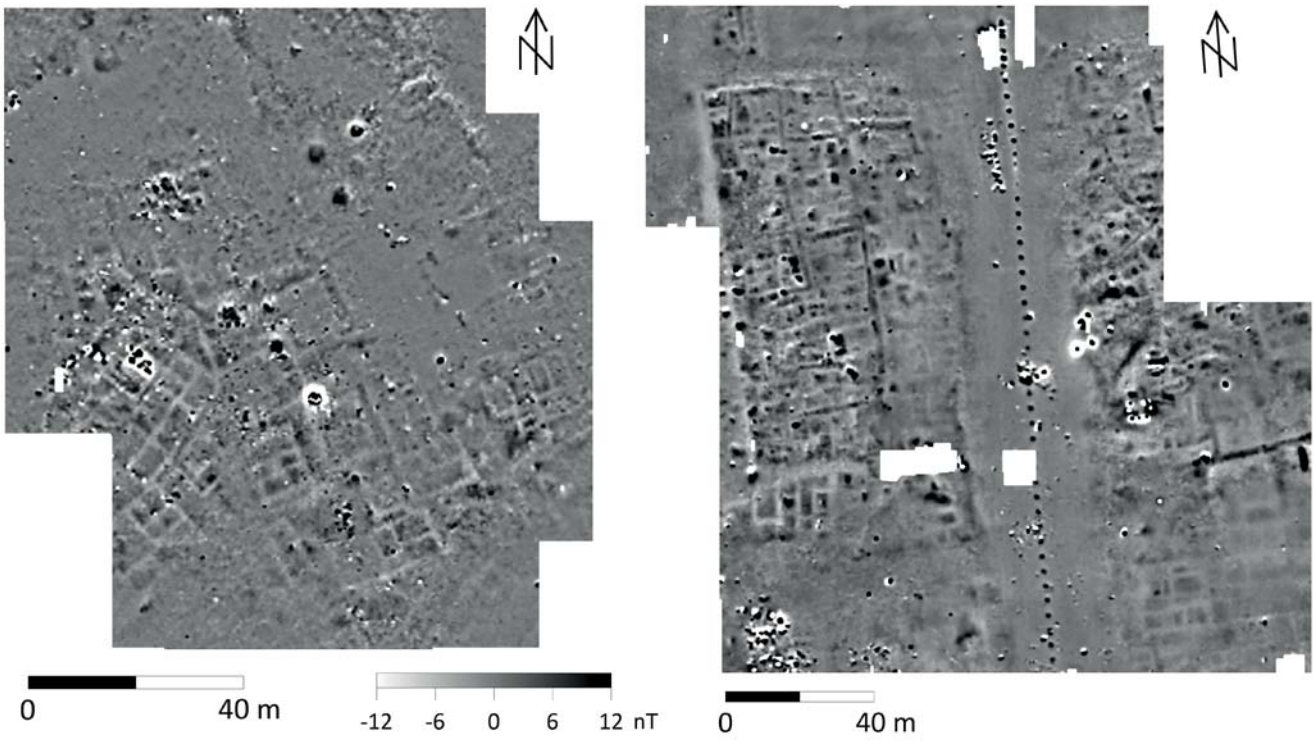


Fig. 2. Magnetic maps. Left: survey in Philoxenite (project of Centre d'études alexandrines). Right: survey in Kom Bahig (project of Centre d'études alexandrines). Fluxgate gradiometer, sampling grid 0.25 m × 0.50 m (maps T. Herbich)

Methodology and data processing

Caesium magnetometry

During measurements with a Geometrics G-858 caesium magnetometer at Philoxenite in 2018, the values of the total magnetic field intensity (TMI) were recorded and the pseudo-gradients of its horizontal component were calculated (based on the difference between two sensors). The measurement works covered an area of approximately 21.5 hectares. Field data were collected over 10 working days on parallel bidirectional profiles at 1 meter intervals on N–S lines. The sensors were placed horizontally 0.5 m above ground level. The acquisition frequency was 10 measurements per second, which makes a distance between readings of approximately 0.12 m. The prospection results prepared with Mapmag 2000 were presented graphically using the SURFER-14 package in the form of grayscale maps [*Fig. 3*].

Fluxgate gradiometry

A fluxgate-type gradiometer by Geoscan Research, model FM 256, 0.1 nanotesla (nT) resolution, measuring the vertical component of the magnetic field (Aspinall, Gaffney, and Schmidt 2008: 34–41; Gaffney and Gater 2010: 61–67) was used for measurements. Readings were taken in grids 20 m × 20 m, with points every 0.25 m along traverses 20 m long, set every 0.5 m [*Fig. 4*]. The

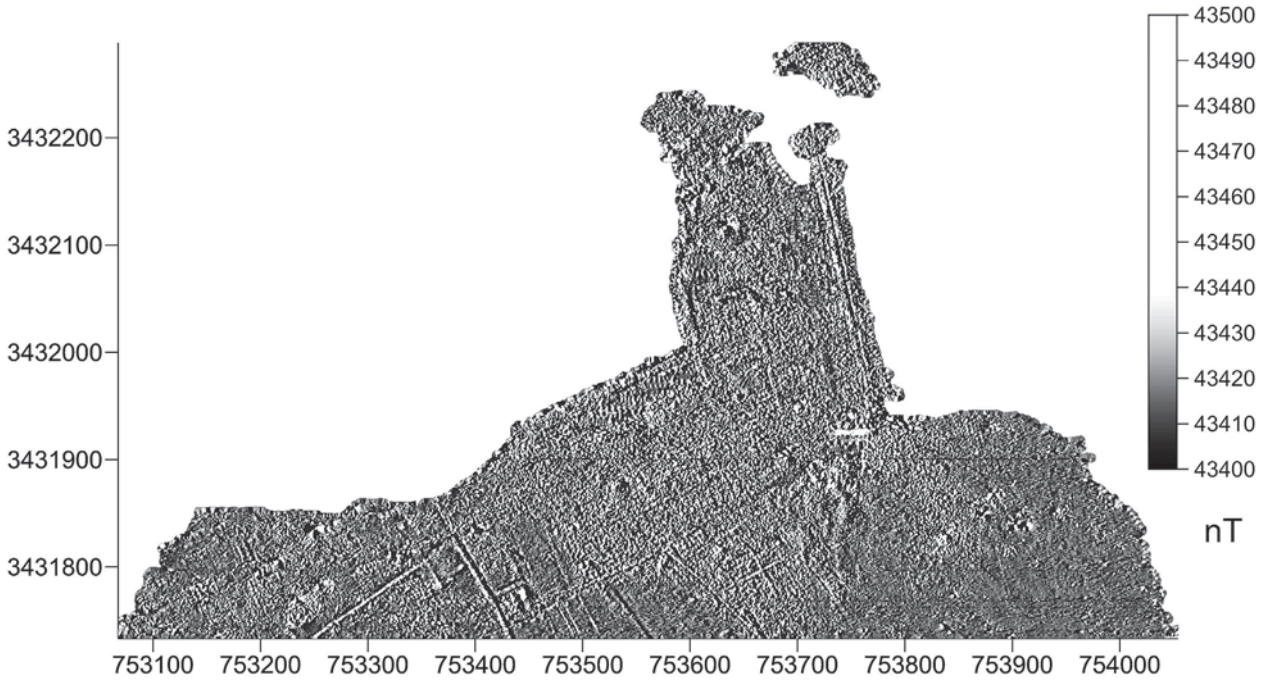


Fig. 3. Magnetic map of the northern part of Philoxenite. Geometrics G-858 caesium magnetometer (map K. Misiewicz)

traverses followed a N–S orientation. The measurements were carried out in zigzag mode, meaning that the instrument was moved along the traverses in two directions. A sampling density of 8 measurements per square meter (0.25 m × 0.50 m) guaranteed the recording of even small-sized structures (e.g. walls not more than 0.2 m wide).

Measurement data was processed using Geoplot 4.0 and Surfer 15.0 software. Algorithms applied included despike, destagger, zero mean traverse. The data were interpolated to a 0.25 m × 0.25 m grid and a low pass filter (Gaussian, xy radius equal to 2) was applied (Aspinall, Gaffney, and Schmidt 2008: 115–134). The results were presented as grey-tone maps, with white and black colours corresponding to extreme measurement values. Negative values are typical of measurements made with a gradiometer: the intensity of the Earth's magnetic field is measured by two sensors placed one above the other (0.5 m apart in the case of Geoscan equipment) and only the differences between the readings are recorded. This



Fig. 4. Survey with fluxgate gradiometer Geoscan Research FM256 (photo T. Herbich)

procedure limits the measurements to local changes of magnetic field, and avoids the disturbing influence of daily fluctuations of field intensity and of changes due to the varied geological ground structure. FM instruments by Geoscan Research are capable of tracing changes in ground structure down to a depth of 0.5–4 m, depending on the magnetic susceptibility of the features (Herbich 2014).

DEM

Topographic measurements were carried out using the precise SH3 Topcon Real Time Kinematic Global Positioning System which is part of a set of devices used for measurements using a caesium magnetometer [***Fig. 5***]. The aim of the research was to obtain data for the preparation of a digital land surface relief model. This type of measurements is increasingly used in archaeological research (Leckebusch 2005; Roosevelt 2014). In our case, base and mobile receivers were used. The mobile receiver recorded reference corrections measured by the base station and transmitted via radio in the UHF frequency range 410–470 MHz (0.5 W–1.0 W). During the measurements, corrections were sent in the compact measurement record (CMR) format. The data were recorded in the metric system (UTM—Universal Transverse Mercator—zone 35 N-EPSG:32635) and presented

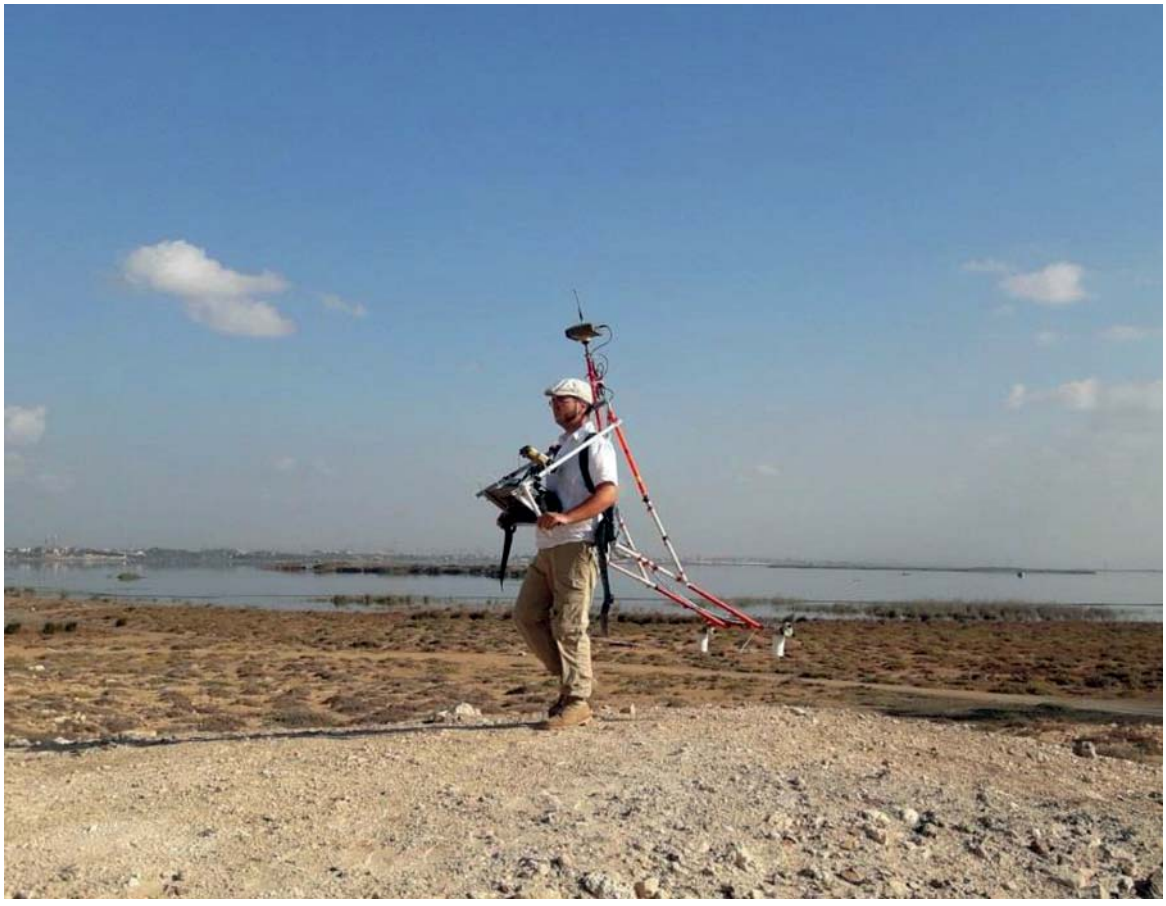


Fig. 5. Survey with the Geometrics G-858 caesium magnetometer and SH3 Topcon Real Time Kinematic Global Positioning System (photo K. Misiewicz)

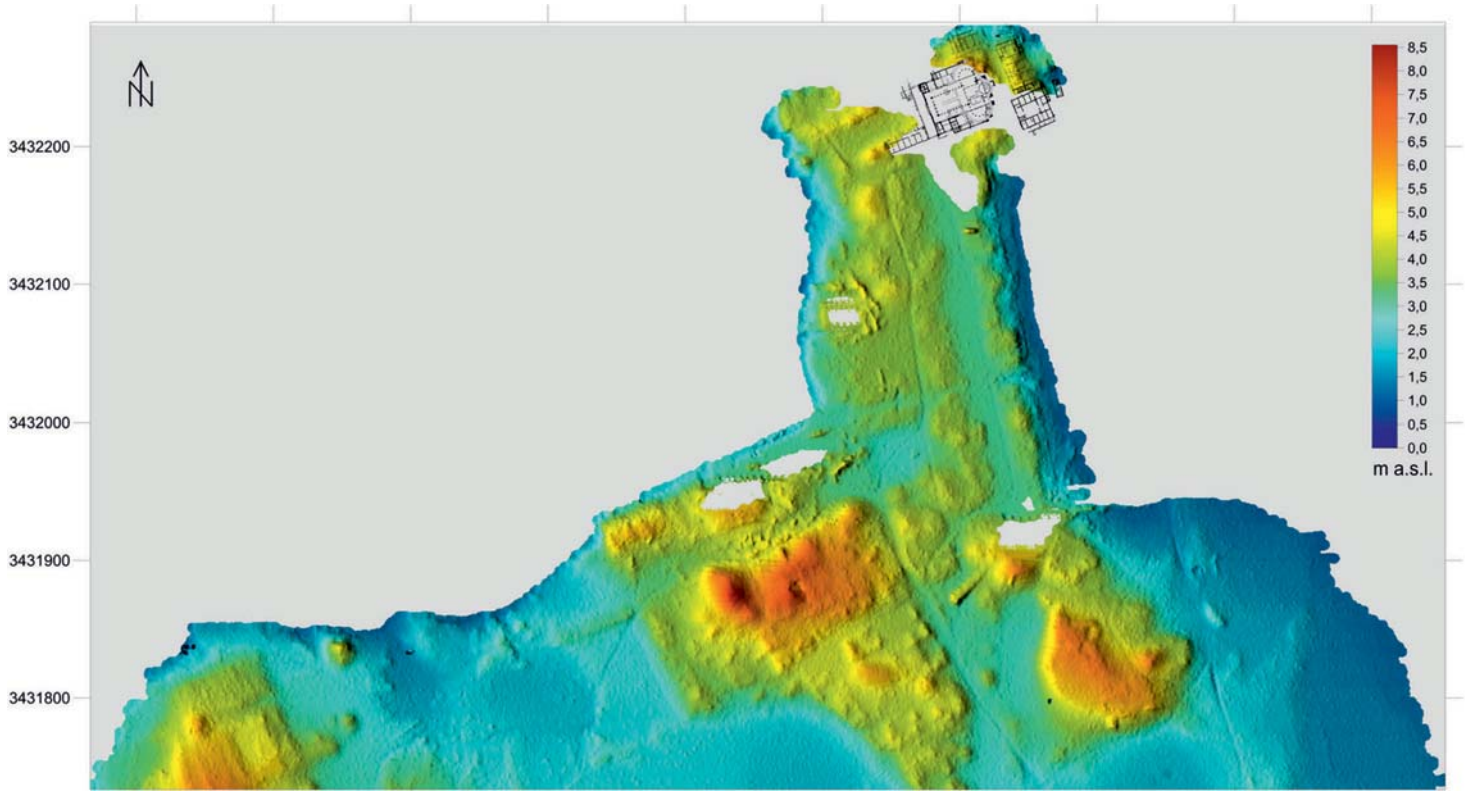


Fig. 6. Digital terrain model (DTM) of the northern part of Philoxenite (drawing W. Małkowski)

in the form of colour maps of the distribution of height values above the level seas [*Fig. 6*]. The potential preparation of a model of total elevation changes within the studied area required many additional topographic measurements in the field and was not entirely justified considering the amount of work in relation to the expected effects. This resulted from the fact that excavations are still being conducted in the northeastern part of the site, and the uncovered objects are exposed (after performing protective and conservation procedures) as permanent ruins. This applies to the Christian basilica and its immediate surroundings. Therefore, the effect of significant differences in the elevation of the terrain in places of already excavated objects and the preserved original surface of the site is normal. One possible solution would be to prepare a DTM by combining satellite image data with elevation documentation collected during the excavation. However, this approach raises the challenging issue of variable data resolution. Satellite imagery can range in spatial resolution from several centimeters to several meters; for the purposes of archaeological documentation at this site, the images were acquired at an estimated resolution of 0.5 m. Given that our objective was to obtain supplementary information facilitating the interpretation of recorded variations in magnetic field intensity—both in relation to buried features and to structures visible on the surface—the resolution available in the DEM was considered fully sufficient.

Results

Results of the caesium magnetometry in the urban area

During magnetic measurements at Philoxenite in 2018, a number of anomalies of various nature were identified, the source of which were both changes in the magnetic properties of buried structures and archaeological objects, the presence of contemporary rubbish on the surface of the site (including metals and heavily burned objects) and heaps deposited in the vicinity of archaeological trenches. The exact characteristics of individual anomalies (including attempts to determine the depth of objects that are the source of recorded changes in the magnetic field intensity) was already discussed in detail by Derda et al. (2021: 123–128). Therefore, this work focuses mainly on the presentation of documentation allowing the interpretation of structures that have not been previously archaeologically studied, while increasing the resolution and thus the readability of the graphical documentation from the conducted research [*Fig. 7*]. Also, greater connection of the distinguished anomalies with information on changes in the ground surface relief within the area covered by the measurements was introduced. Reanalysis of the measurement results for the



Fig. 7. Denotation of the most important structures within the town on DTM (drawing M. Gwiazda, A.B. Kutiak, and M. Łuba)

purposes of this publication was justified and even necessary, because the presence of strongly magnetized structures in the study area (furnace remains, heavily burnt red bricks, production residues on the surface) makes anomalies in places where the contrast between archaeological objects and their surroundings is medium, less legible.

Integration of caesium magnetometry results and DEM with archaeological data

The preparation of a new map documenting the results of magnetic measurements in 2018, as mentioned above, required the reinterpretation of some of the results obtained then. This reinterpretation required additional activities consisting of three stages. The first was to determine the types of detected magnetic anomalies; the second was to link them with information on terrain features—that is, to interpret the changes in the terrain height contained in the prepared digital elevation model (ground surface relief) DEM and, in the final stage, to link specific anomalies with archaeological remains invisible on the surface. At this last stage, cooperation with archaeologists working in the area was invaluable. This applies particularly to areas located near the excavation trenches conducted between the northeastern border of the site and the atrium of the excavated church [***Fig. 8: B1, H1***]. The results of magnetic measurements [see ***Fig. 3***] allow for the separation of various types of magnetic anomalies related to both the magnetic properties of buried structures and the type of deposits lying on the surface and changes in the surface relief. Three main types of anomalies were distinguished: clearly visible linear structures with different dynamics of changes—from several to a dozen or so nT—revealed in places where we were dealing with a significant magnetic contrast between the archaeological remains and their surroundings. We were dealing with both increases and decreases in the recorded values in relation to the background. of the source objects. The most visible anomaly of this type is a long, narrow linear structure located parallel to the shoreline of Lake Mariout. This is the longest anomaly visible on the map, measuring about 220 meters from the Basilica area to the place where one of the baths was discovered and partially excavated. The range of the recorded magnetic field intensity of this anomaly was between 10 and 20 nT. The second type of anomaly was a change with low dynamics that appeared in large areas with boundaries that were sometimes difficult to define. Their source was usually changes in the near-surface layers, very often related to the deposition of materials from previous excavations on the surface. The third type was a change with very high dynamics with characteristic decreases and increases in values to the north and south of the object causing them. These were the so-called bipolar or dipole-dipole anomalies, and the high and dynamic range of measured values (with the difference between the highest and lowest sometimes exceeding 100 nT) give us information about the possibility of strong burning of the object causing the recorded changes. These may be also invisible on the surface remains of kilns, e.g. metallurgical or glass furnaces, but also ash, slag or remains of casting moulds lying on the surface.

Finally, the last type of anomalies distinguished were changes in the magnetic field intensity values, which did not result from the presence of the searched archaeological remains, but appeared in cases when, while performing measurements on the slopes, we could not ensure the same height of the magnetometer probes above the ground level. In identifying these changes, topographic data presented in the form of DEM were extremely helpful [see ***Fig. 6***]. As highlighted in the publication of research results in 2021 (Derda et al. 2021), the combination of topographic

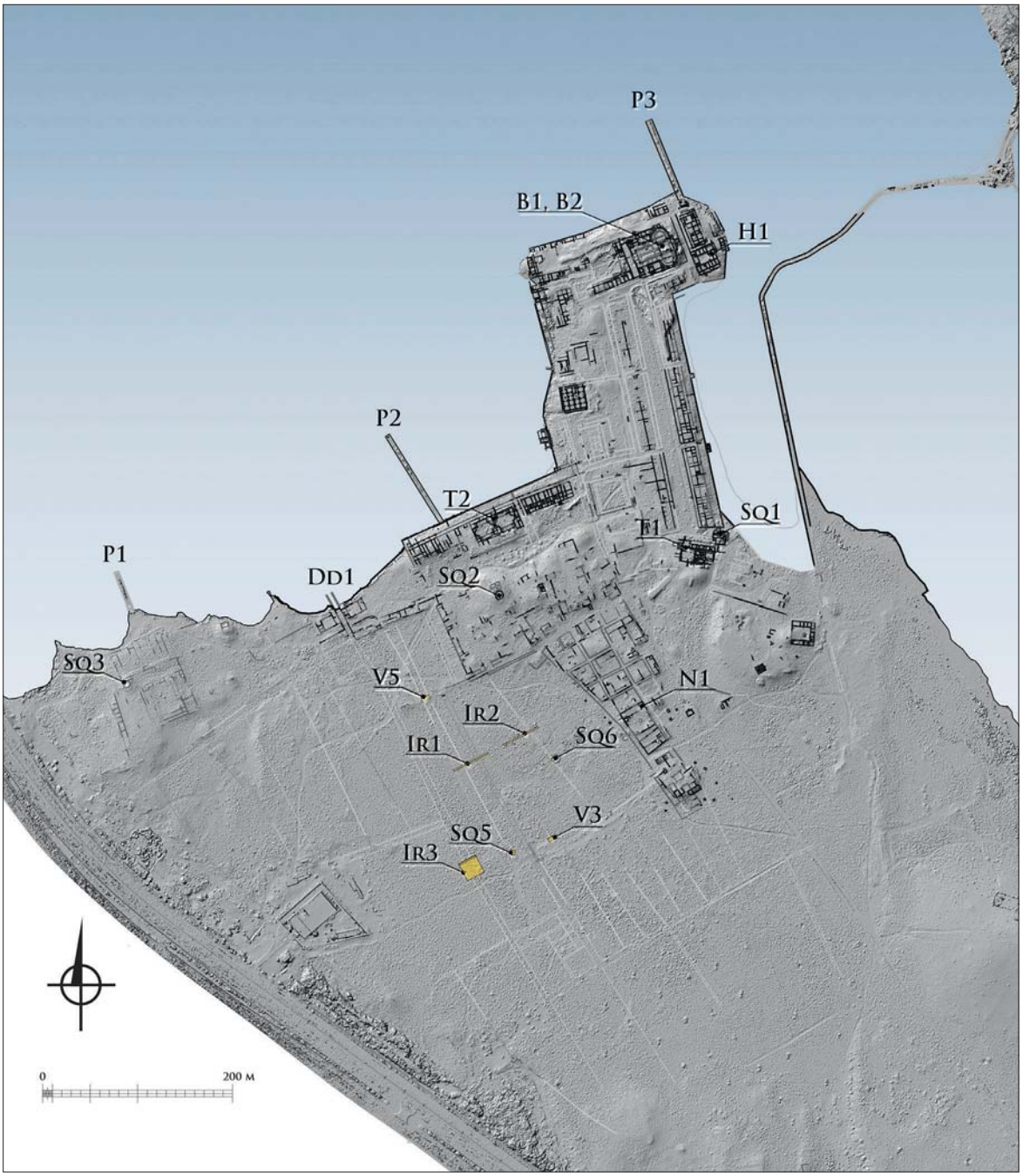


Fig. 8. A map of the site denoting structures mentioned in text. The white lines mark hypothetical canals (drawing M. Gwiazda, A.B. Kutiak, and M. Łuba)

research results and magnetic measurements verified by surface works allowed to determine the built-up area of the city. A new map with the measurement results, but also new field walking research carried out after 2021 in connection with gradient measurements made it possible to clarify the preliminary findings regarding the issue of the boundaries of compact development (see comments on the results of fluxgate gradiometry survey in the urban area research below).

After the analysis of the maps prepared in 2021 numerous magnetic anomalies were identified in the area we examined. Also, their verification by field walking survey or even excavations have been performed. That allowed for a reliable interpretation of 16 of them [see ***Figs 3, 7:3–12, SQ2–3, FR1–2, 8***]. Moreover, there are three significant anomalies simultaneously related to the shape of the terrain, which are noticeable in the digital terrain model of the site [see ***Figs 6, 7:1–3, A2***].

The structures marked in the figures were described in detail in the 2021 publication (Derda et al. 2021). Here we will only mention those whose presence not only credibly confirmed the identification of the probable sources of a similar type of anomalies visible both on magnetic maps and on the DEM, but also provided the basis for preparing a project for further excavation works.

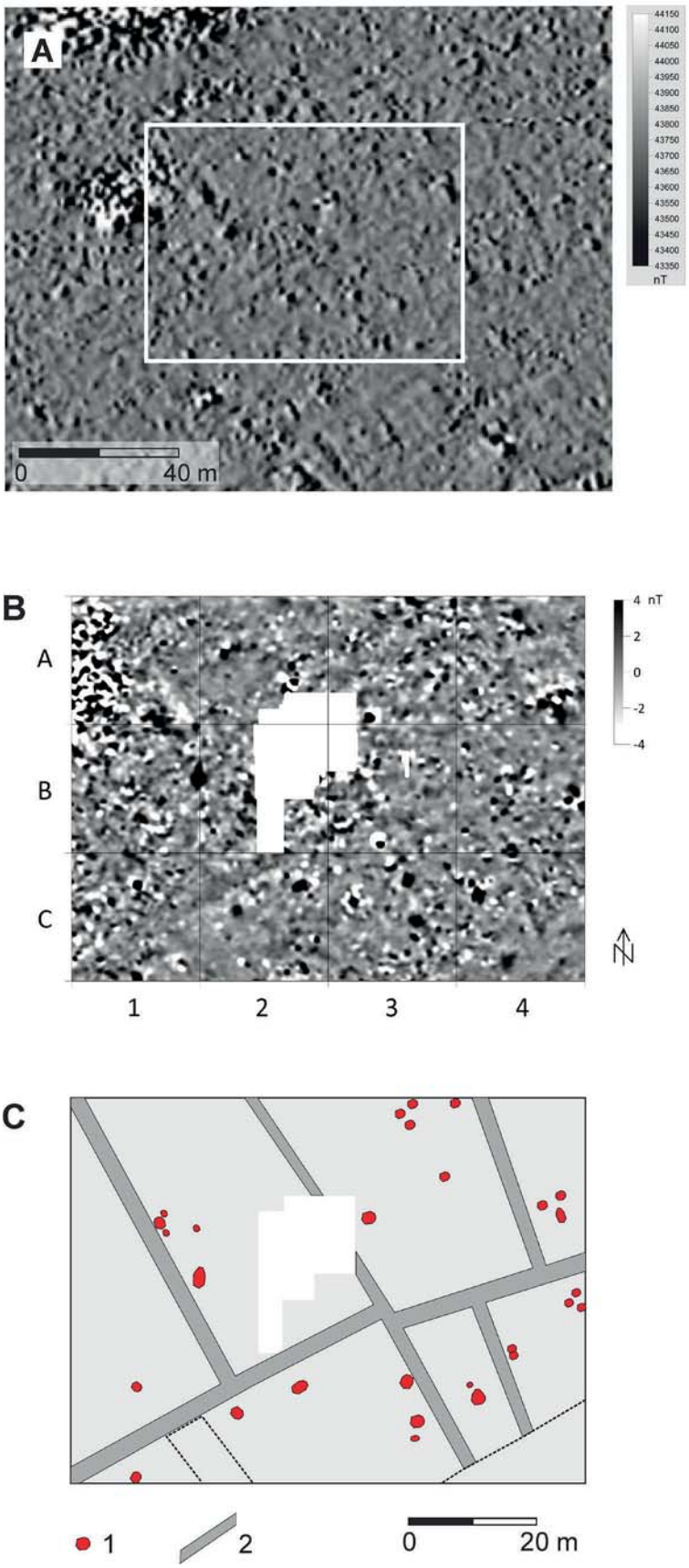
This group includes: an anomalous zone over 100 m long recorded near the eastern shore [see ***Fig. 7:4***, see also ***Fig. 3***], where excavations revealed the presence of deposits from the Byzantine period at a depth of 0.25 m, visible as a layer of dark brown soil over a metre thick with a significant content of ash and slag; two anomalies of very large amplitude [see ***Fig. 7:5 and 6***] on the southern side of the western and eastern baths. The first, measuring about 42 m × 18 m, has an elongated shape, while the second resembles a circle with a diameter of 24 m. The source of these anomalies were the remains of buildings from the Byzantine period, including pools with cold and warm water. A detailed description of these remains is included in the 2021 publication (Derda et al. 2021) and finally two extensive anomalies on the tops of the terrain elevations [see ***Figs 7, 8:SQ2 and SQ3***] related to the remains of a saqia (water lifting device) (Derda et al. 2021).

We considered the above-mentioned groups of anomalies to be important not only for confirming the effectiveness of magnetic measurements as a tool for recognizing archaeological sites of large areas, but also for planning non-invasive activities using the gradiometer measurements described below.

Results of fluxgate gradiometry survey in the urban area

An area of 0.45 ha in the central part of the town was measured with a fluxgate gradiometer [see ***Fig. 1***]. Past excavations in Sector F2 and the results of magnetic surveys using a caesium magnetometer in this area confirmed the presence of architectural remains [***Fig. 9A***, see also ***Fig. 3***]. Some longitudinal anomalies observed on the map, each 3–5 m wide, characterized by uniform values of magnetic field, are interpreted as streets [***Fig. 9B*** (anomaly visible between SW corner of C1 and B3)]. The same can be said of point anomalies in a linear arrangement demonstrating higher amplitude of magnetic values (e.g. between the top of A2 and B3). The plans of individual buildings cannot be reconstructed because of the extensive magnetic noise caused by red-brick debris. Stone blocks on the surface, lining both sides of the streets indicated by the magnetic map, constitute evidence of their existence [***Fig. 10 top***]. Magnetic mapping has also revealed two areas characterized by uniform values of magnetic field intensity, visible in the SW part of C2 and the eastern part of C1, and in the SE part of C4 [see ***Fig. 9B***]. These could be interpreted as undeveloped areas (town squares?).

Numerous anomalies, small in diameter (up to 1 m) and with high-amplitude values, correspond to clusters of red bricks. Anomalies of a larger diameter (up to 2–3 m) and positive values



(up to 15 nT) dominating over negative ones most probably correspond to hearths and furnaces.

Magnetic imaging of the town area unexpectedly did not match the quality of results obtained during the earlier survey of the island [see ***Fig. 2A***]. Apparently, ash from the Ptolemaic workshops covering the architecture, had created the effect of high magnetic contrast between remains of walls and their surroundings.

A comparison of the results obtained with the two instruments demonstrates the superior quality of the data from the gradiometer over that from the caesium magnetometer [see ***Fig. 9A–B***]. Mapping by the caesium magnetometer provides the base for reconstructing the course of two streets, which are also evident on the gradiometer map, between the southwestern corner of C1 and the eastern edge of B4 and between the southwestern part of B4 and the central part of C4. The other streets traced on the image in ***Fig. 10 top*** [and reconstructed in ***Fig. 9C***] are difficult to trace on the map generated by the caesium instrument. The same can be said of anomalies interpreted as images of hearths and furnaces: those from the gradiometer are much more distinct.

Fig. 9. A: Magnetic map. Geometrics G-858 caesium magnetometer. White box marks extent of the survey done with fluxgate gradiometer. B: Magnetic map. Fluxgate gradiometer Geoscan Research FM256. C: Graphic interpretation of the result of the survey done with fluxgate gradiometer: 1. kilns, ovens, hearths; 2. streets. Dashed lines mark areas with no architecture (maps and drawing T. Herbich)



Fig. 10. Top: View of the site in the urban area. Blocks marking the edge of the street (registered by magnetic survey) visible on the surface. Bottom: View of the surface in the low area south of the urban district. Person on the left stands at the place where the anomaly corresponding to the saqiya was registered (photo T. Herbich)

Results of fluxgate gradiometry survey south of the urban area

The flat ground south of the town limits is covered with low vegetation [***Fig. 10 bottom***]. Based on its location, topography, and the absence of stone structures (apart from infrequent stones and red-brick debris) is interpreted as the agricultural hinterland (Gwiazda, Derda, and Barański 2022: 367–368; Gwiazda, Kotarba-Morley, and Derda 2024). Part of this area was surveyed with the caesium magnetometer [see ***Fig. 7:2***]. The only logical explanation for the linear anomalies mapped at the time, in light of the agricultural interpretation of the area, was that at least a part of them reflected irrigation canals for watering the fields.

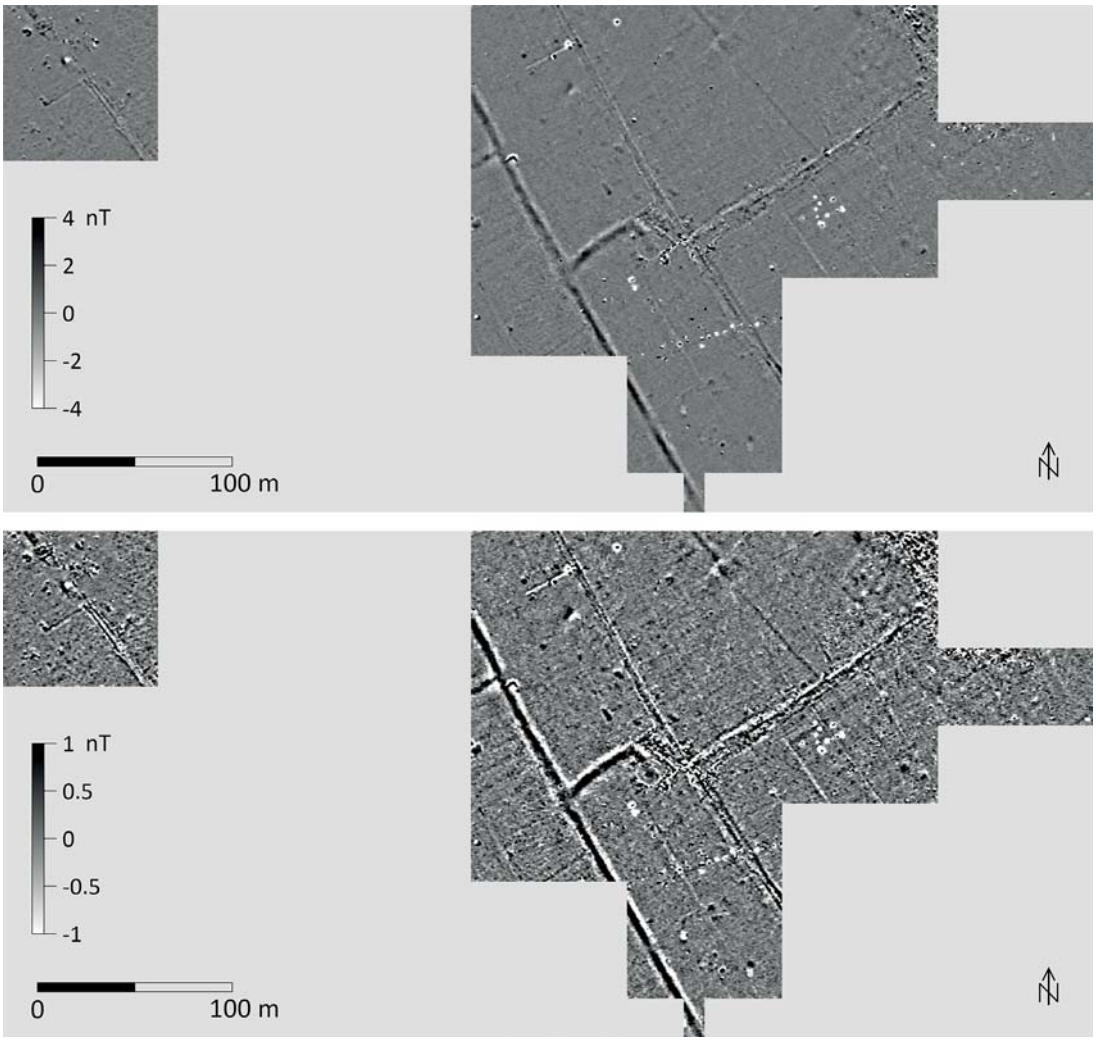


Fig. 11. Magnetic maps of the survey south-west of the urban area. Fluxgate gradiometer Geoscan Research FM256 (maps T. Herbich)

Measurements covered a total area of 5.46 ha [see ***Fig. 1***] and revealed a number of linear anomalies characterized by higher and lower values of magnetic field (between –2 / +5 nT) [***Fig. 11***]. The linear shape of these anomalies and their arrangement resembled the earlier findings, hence their proposed interpretation as images of canals of different size and structure. It was suggested that the different shape of the anomalies interpreted as canals was due to different methods of construction.

The largest of these canals is located in the western part of the area (between B7 and G9) [***Fig. 12A***]. The northern section, which touches upon the lake waterfront, was registered by the caesium instrument [see ***Fig. 3***]. The new measurements redefined its position earlier traced by the caesium magnetometer. The anomaly corresponding to the canal is approximately 8 m wide in its central part, narrowing to 5 m in the southern and northern parts [see ***Fig. 12A***]. The magnetic value of the canal fill rises to about 3 nT. The lack of distinctive anomaly borders suggests that the canal [***Fig. 12B:1***] took the form of a ditch without reinforced edges, a hypothesis borne

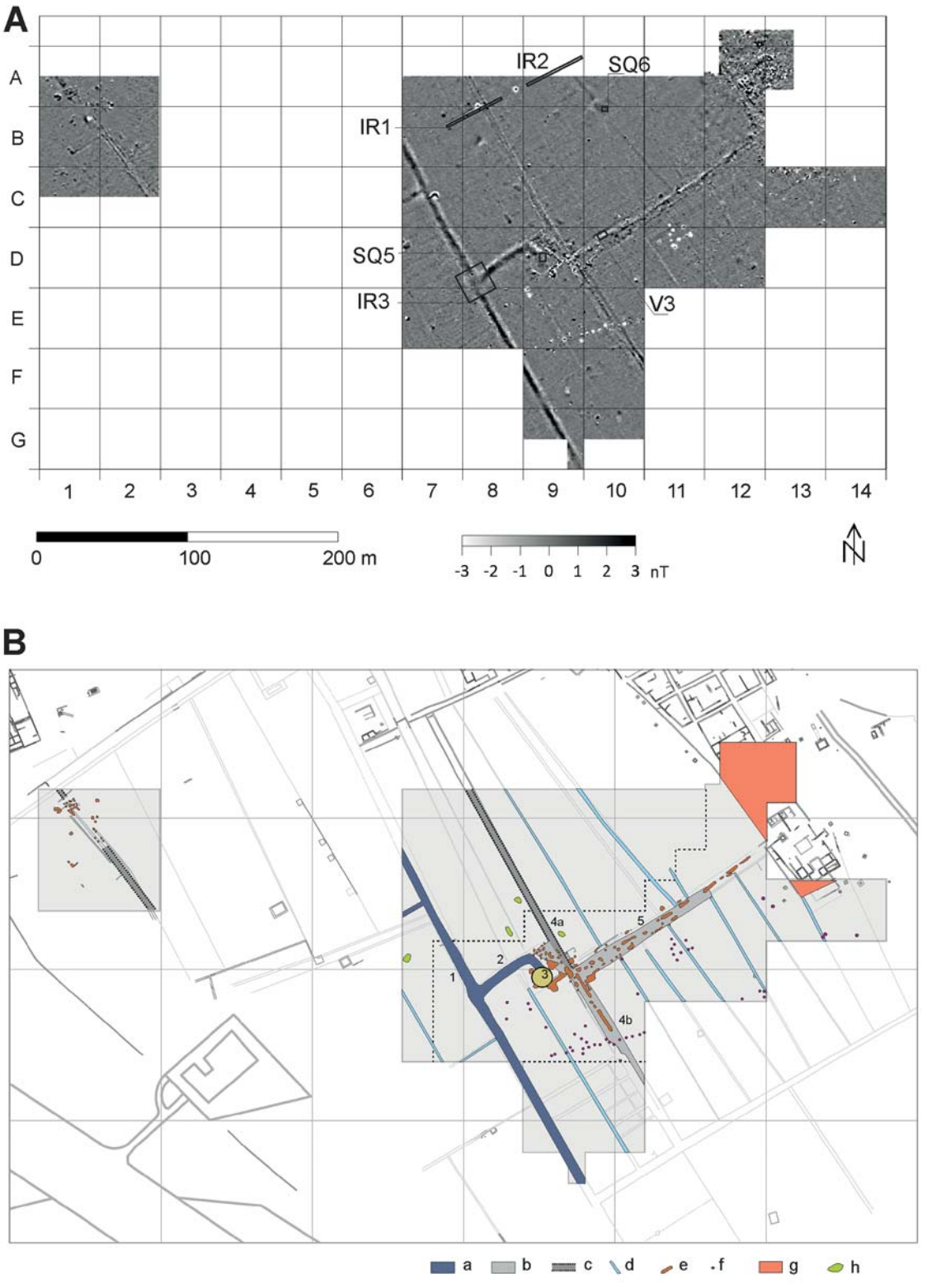


Fig. 12. A: Magnetic maps of the survey south of the urban area. B: Graphic interpretation of the magnetic survey result: (a.) large channels without reinforced banks; (b.) structures related to the transport of water; (c.) channel with reinforced banks; (d.) narrow channels or ditches; (e.) groupings of burnt brick fragments and mortar with a considerable amount of crushed ceramics; (f.) modern iron objects; (g.) remains of town architecture; (h.) pits (map and drawing T. Herbich)

out by no stone or brick fragments visible on the surface along the projected course of this waterway. Fragments of stone blocks on opposite sides of the canal were registered solely in the northern part of Square D7 [see ***Fig. 12A***]; they could perhaps be the remains of a crossing bridge. In the central part of the surveyed section of the canal, measurements showed an anomaly of identical nature, approx. 30 m long, leading to a circular feature with a diameter of approximately 15 m (in D8–D9). It seems that the exposed feature can be interpreted as a branch of the main canal [***Fig. 12B:2***], supplying a saqiya with water [***Fig. 12B:3***].

Excavations verified the size and structure of the canal and the function of the circular feature interpreted as a saqiya (the results of these excavations have not been published yet). The western edge of the anomaly interpreted as a canal turned out to correspond precisely to the western side of the canal excavated in Trench IR3 [see ***Figs 8 and 12A***]. The fill contained deposits of darker color that were responsible for the higher magnetic intensity readings. The canal was explored to a depth of 1.6 m. Coring in 2021 (Core 2, see Chapter 8 in this volume) indicated that it was 3–4 m deep. Negative values at the edges of the anomaly could reflect ancient spoil heaps of sand left from the digging of the canal and recognized in the archaeological trench. Trench SQ5, which was opened on the spot of the hypothetical saqiya and explored to a depth of only 0.35 m, revealed the outline of a circular structure matching exactly the edges of this feature on the magnetic map [see ***Figs 8, 11, and 12A***]. Excavations did not uncover a stone structure marking the outer shape of the saqiya, as had been the case with the saqiya found in the survey areas covered by the caesium instrument [see ***Fig. 7***].

The arrangement of anomalies to the east of the saqiya indicates that water flowed in a canal parallel to the main one, running northwest and southeast [***Fig. 12B:4a and 4b***], and another canal running northeast [***Fig. 12B:5***]. From this canal, it was distributed across the fields through successive waterways oriented northwest–southeast. The unique arrangement of anomalies corresponding to individual canals suggested different methods of construction. The anomaly corresponding to the southern section of a canal marked as 4a (4–5 m wide) has edges marked by reduced field intensity values. This could indicate that the earth banks were reinforced with stone, an idea supported by the numerous stone fragments found on the surface at the location of the canal. The northern section of the canal has the shape of two linear, higher-intensity anomalies. Archaeological verification in Trench IR2 uncovered two parallel canals reaching a depth of 0.5 m [see ***Figs 8 and 12A***]; these remains corresponded to the two mapped anomalies. Changes in the characteristic of the anomalies corresponding to the northern and southern sections of Canal 4a probably indicate that this part of the irrigation system had sides reinforced in stone and was divided into two channels in the central part of Square B8 or else Canal 4a in its entirety flowed in two narrow beds, but the fill in their southern ends has a much lower magnetic susceptibility, perhaps because it is dominated by sand.

The trapezoidal area characterized by magnetic noise between the canal and the saqiya may correspond to the reservoir where the water was collected. In the case of canal sections 4b and 5, it is difficult to indicate—based on the magnetic map—where exactly the water flowed; all that can be discussed are the places where stone and brick structures were constructed to transport water. Remains of such structures can be observed on the surface in many places, both in the form of blocks and bricks preserved *in situ*, and debris on the surface. On the border of squares C11 and C12 [see ***Fig. 12A***], the structure of Canal 5 changes: a narrow strip of anomalies with higher

values of magnetic field intensity was probably caused by clusters of small brick fragments. The image of the canal disappears in Square B12, on elevated ground at the edge of the urban area. In the case of Canal 4b, which takes on the shape of two parallel lines characterized by higher magnetic values, one might assume, by analogy with the evidence from Trench IR1, the existence of two canals running parallel to one another.

The location of another saqiya was suggested by a large anomaly of irregular shape and small amplitude of values, recorded where squares A10 and B10 meet. Its presence was also intimated by the presence of anomalies reflecting canals: a wider one on the northern side (from where the water would have flowed) and a narrower one running off to the south. However, excavations down to a depth of 0.3 m in this spot [see ***Figs 8, 12A: Trench SQ6***] did not uncover any remains of the saqiya.

An analysis of the magnetic image in the narrow range of values shows how different the fields between the canals are [see ***Fig. 11 bottom***]. This may be because of how they were used, that is, how different crops could have structured the lie of the land. For example, a characteristic feature of the area on the west side of Canal 1 is the presence of numerous anomalies with higher magnetic values, up to 1 m in diameter. Such anomalies are not visible east of the canal. In many places, decreases or increases in field intensity values are visible, arranged along parallel lines. This may be a reflection of the land surface formation typical of artificially irrigated areas, facilitating even distribution of water within the field.

The magnetic survey also covered part of the urban area. This corresponds to disturbances in the magnetic field observed north of Square B12 [see ***Fig. 12A***]. On the ground this appears as a distinct ridge separating this area from the cultivated fields. The linear anomaly, which marks the western border of the urban area (across A12), has been interpreted as a wall between buildings and farmlands, detected by caesium magnetometry and uncovered by excavations in Sector N1 in 2021 (Gwiazda, Derda, and Barański 2022: 364–366). It is worth taking a closer look at the cluster of anomalies registered in the central part of A12: the arrangement most likely corresponds to the layout of the building, with rooms filled with materials of increased magnetic susceptibility. On the surface, heavily burned clay fragments and ash can be seen; excavations revealed presence of burnt bricks (Gwiazda, Derda, and Barański 2022: 367).

Anomalies of high amplitudes seen around Canal 4b and on the south side of Canal 5 correspond to metal bars in concrete blocks, which were too heavy to be moved when carrying out the survey.

Summary

Summarizing the result of the research using caesium magnetometry, we can state that the conducted activities provided data from an area of over 21 ha. This data in the form of general and detailed magnetic maps and a digital terrain model DEM together with calibrated satellite images were integrated in a unique project using the GIS methodology. This provided access to them to all researchers conducting field prospection and excavation work. Magnetic measurements were particularly effective in identifying structures made of red brick. In several cases, it was possible to determine the location of the furnace, water tanks or bath structures. A certain difficulty was the location of archaeological remains characterized by smaller differences in magnetization values between the objects themselves and their surroundings. In such cases, it was difficult to obtain

data that would allow for the preparation of maps with a level of detail that would allow for the precise location of the sought-after structures, invisible on the surface. The most important thing is that the prepared documentation facilitated the identification and inventory of objects visible on the surface, as well as the rational location of archaeological excavations and surveys. In this way, data on dating was obtained, which is not provided by non-invasive prospecting, and an attempt was made to determine the boundaries of urban development and preliminary dating and determining the probable function of objects located as a result of non-invasive activities. Such attempts were made immediately after the completion of measurements and preparation of the preliminary data processing. Detailed information on this topic, together with the presentation of proposed hypotheses on the boundaries of development and determining its probable boundaries, is included in the summary of the publication of research results in 2021 (Derda et al. 2021).

The magnetic method has also proved to be an effective tool in reconstructing the water infrastructure system. Research has uncovered a network of canals and established a grading of importance from a main canal bringing water from the lake, through a series of branches from which water was drawn to supply a network of small canals irrigating the fields. Measurements have so far covered only a small percentage of the area presumed to have been cultivated in antiquity (about 20%), but the results promise, assuming the survey is completed, a full image, unprecedented in Egypt, of water management in the cultivated hinterland of a large town.

The application of two measuring methods for magnetic prospection—a magnetometer measuring the total intensity of the Earth's magnetic field combined with RTK positioning, and a gradiometer positioning measurements in a local geodetic grid—enabled an evaluation of the effectiveness of each. Despite the limited area covered by both instruments and hence providing results for comparison (60 m × 40 m), the results leave no doubt that the method based on measuring the gradient yields a more detailed image of the architecture in its urban setting, especially the street network. The image is also much clearer with regard to features presenting high magnetic values due to the phenomenon of thermoremanence (furnaces, hearths). Measurement of the vertical gradient enables a more precise location of particular features, their dimensions, and shapes. In the case of features of larger size, like furnaces, this conclusion derives from a comparison of the results from Philoxenite with results from other sites in the vicinity of the lake. It should be noted, however, that when preparing the graphical presentation of the measurement results obtained with the caesium magnetometer no additional data filtration was performed.

Regarding the system configuration as applied at Philoxenite (two independent probes in the caesium instrument and an array of probes in the fluxgate gradiometer), the prospection with a caesium magnetometer had the advantage of being twice as fast compared to that with a gradiometer and the use of an RTK for positioning provided the data for building a very precise 3D-model of the ground surface. It may also be of significance that an RTK is operated by a single individual, while a survey using a local grid requires personnel to move the tapes marking out the traverse lines.

Integrating the results of research at Philoxenite with the application of various methods produced a large amount of new information within a limited period of time. Thanks to the multidisciplinary approach, it was possible to identify many features of the site's topography. In most cases, these had not been identified during earlier archaeological works. The conclusions on the site's size, form, and the function of its particular areas open a new chapter in archaeological research, while also becoming an essential point of reference.

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Chapter Eight

PHYTOLITHS ANALYSIS FROM SEDIMENTS OF PHILOXENITE

Abdelfattah A. Zalat

Introduction

The developing methods for understanding agricultural origins through archaeological investigation and identifying the remains of palaeovegetation like crop plants have been a focus of paleoethnobotany during the past three decades (Ball et al. 2016). Phytolith analysis is one of the most effective methods used in archaeobotany. Phytoliths are non-organic silica microfossils that are composed of silicon dioxide produced by many plant groups where deposited between the cell walls as opal and may be dispersed in leaves, roots, stems, and even seeds. Their morphology resembles the shape of the cells in which they are formed. They can preserve well in soils and lake sediments for millions of years due to their high resistance to decomposition (e.g. Prasad et al. 2005; Piperno 2006; Strömberg and McInerney 2011; Saxena, Prasad, and Singh 2013). They are deposited into terrestrial soils beneath parental plants and are believed to provide a local vegetation signal (Piperno 1988; Crifò and Strömberg 2020).

Many researchers have used phytoliths to answer both traditional and nontraditional archaeobotanical questions, within archaeological and paleoenvironmental sampling contexts (Rosen 2008). Some of the most common uses for phytoliths are very important in archaeology to recognize the plant taxa utilized at archaeological sites and detection of plant types used for determining ancient activities. A great attention of modern science is given to the study of phytoliths as new vegetation, environment, and climate proxies (e.g. Lu et al. 2006; 2007; Barboni et al. 2010; Sánchez, González, and Genise 2010), which have now been used successfully for reconstructing aspects of past vegetation dynamics in response to human behaviour, paleoenvironmental changes and climatic variability, including Africa savannah (Novello and Barboni 2015). During the last three decades, phytoliths effectively provide novel insights into the regional vegetational changes in terrestrial soils where pollen grains alone cannot differentiate or typically decay (Witteveen et al. 2024). In addition, the phytoliths remains that recovered from sediments of archaeological sites, are applied to define agricultural and cattle-breading activities of ancient people, help to date the time of grass diversification and to identify plants used by people in ancient and prehistoric periods (Strömberg 2004; Danu et al. 2019; Wang et al. 2019).

The Poaceae are high producers of phytoliths, and each subfamily has its own diagnostic morphotypes. As a result, phytoliths can be used to identify the Poaceae subfamilies and occasionally species levels. In addition to the high taxonomic value of grass phytoliths, several subtropical and tropical plant groups such as Palmeae also contain diagnostic phytoliths that can distinguish palms from other taxa (Morcote-Ríos, Bernal, and Raz 2016; Huisman, Raczka, and McMichael 2018).

This study focuses on Philoxenite, shedding light on the paleovegetation history and human activities during the Byzantine–early Islamic period at the site.[1] Consequently, to achieve this aim, the current study will be based mainly on the phytoliths from the sediments obtained from Philoxenite site as a bioindicator tool to identify past associations of Poaceae subfamilies and others and tracing the palaeovegetation. The chronology of the investigated sediments was determined based on the analysis of ceramics found in the cores.[2] No previous studies of Holocene phytoliths have been carried out in Egypt, in particular the studied archaeological site. Therefore, our study is considered a new contribution by using phytoliths analysis to reconstruct the palaeovegetation history and the climate changes at the Philoxenite site during the Byzantine–early Islamic periods.[3]

Materials and methods

Materials of study

Materials used in the present study were obtained from two cores excavated on a relatively flat surface at the Philoxenite [***Fig. 1***]. Core 1 drilled to the depth of 4.45 m and divided into 22 samples. Core 2 recovered from the sedimentary filling of the ancient irrigation canal with a total depth of 4.50 m and included 40 samples. The lithological characters of the studied cores are explained in ***Fig. 2***.

Lithologically, the base of Core 1 starts with a massive calcareous sandstone as a bedrock with thickness of about 4.00–4.45 m, overlain by the compact, dark gray clay contained brown ceramic fragments at depths 3.30–4.00 m, and greenish-yellow clays with ceramic fragments at depth intervals of 3.00–3.30 m. The lithological characters change at 3.00 m depth, where the clay facies are replaced by fine sandy facies at a depth of 2.10–3.00 m. This is ensued by a small thickness of about 10 cm of greenish-yellow clayey silt that is covered by greenish-yellow silt and fine sand with few pebbles and brown ceramic fragments at a depth of 1.85–2.00 m. The sandy facies emerged again by greenish-yellow fine sand to silt at depth 1.00–1.85 m, with dark grey clay interbeds at depth 1.40–1.60 m. The upper part of the core (0.0–1.00 m) is composed of yellow silt with rock fragments and pebbles.

The onset of the Core 2 section at the depth of 4.40–4.70 m consists of a massive calcareous sandstone, followed upward by 30 cm of yellowish-white fine sand to silt. A small unit of grey clayey silt containing ceramic fragments is observed at the depth of 4.00–4.10 m and pursued by 20 cm of dark yellow clayey silt at a depth of 3.80–4.00 m. The lithology is altered to fine sandy clay, including brown ceramic fragments at a depth of 3.30–3.80 m, and covered by small thickness of about 10 cm of greenish-yellow clay with small pebbles. This is tracked by clayey facies at a depth of 2.10–3.20 m, which are composed of compact, dark grey, clay alternated with greenish

[1] In the context of the examined material from Philoxenite, the Byzantine period is dated to the 6th–first half of the 7th century AD, while the Early Islamic period spans the second half of the 7th to the mid-8th century AD.

[2] I extend my thanks to Katarzyna de Lellis-Danys for providing the dating of pottery sherds.

[3] For detailed information on the history of Philoxenite and the archaeological remains associated with this site, see other chapters of this volume, as well as: Gwiazda and Wielgosz-Rondolino 2019; Gwiazda, Derda, and Barański 2022; Gwiazda 2023a; 2023b.



Fig. 1. Plan of Philoxenite showing the positions of the studied cores (drawing M. Gwiazda)

yellow clay that contained ceramic fragments at a depth of 2.70–2.90 m and overlaid by brownish-yellow clay including some pebbles and gravels through the depth of 1.90–2.10 m. A noticeable change in lithology happens by deposition of greenish-yellow clayey silt covering the depth 1.00–1.90 m that is overlain by greenish-yellow clay at a depth of 0.50–1.00 m and followed up by dark yellow clayey silt at a depth of 0.20–0.50 m. The topmost part of the core section of about 20 cm thickness is composed of silt with rock fragments and plant remains.

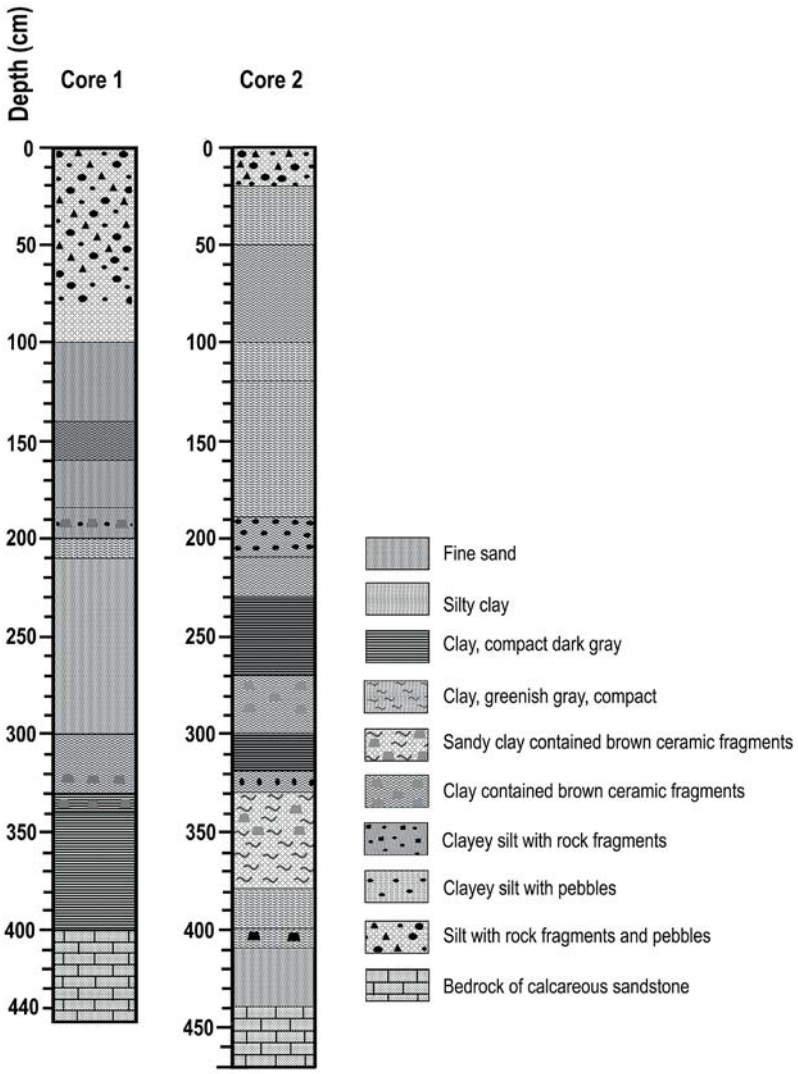


Fig. 2. Lithology of the studied cores sections (drawing A.A. Zalat)

Methods of study

Phytoliths were extracted from 10 grams dry sediment in each sample using the standard procedure by disintegration method in HCl and H_2O_2 (Lu et al. 2009; Zalat et al. 2022). The carbonate fractions were removed by HCl (20%). After being washed with distilled water, the sample was heated in H_2O_2 (30%) to eliminate the organic material. The sample was rinsed in distilled water to remove all acids and the suspension became neutral. Coarse particles were removed by decantation (settling for 5 s) and the sample was concentrated and stored in a final volume of 50 ml vial. About 0.1 ml of the final homogenized suspension was distributed over a clean dry coverslip (22 mm × 50 mm) and dried under low temperature then mounted onto a glass slide with Naphrax (R.I. = 1.74) for microscopic observation. The permanent slides were prepared at the Geology Department, Faculty of Science, Tanta University, Egypt. Identification and counting of

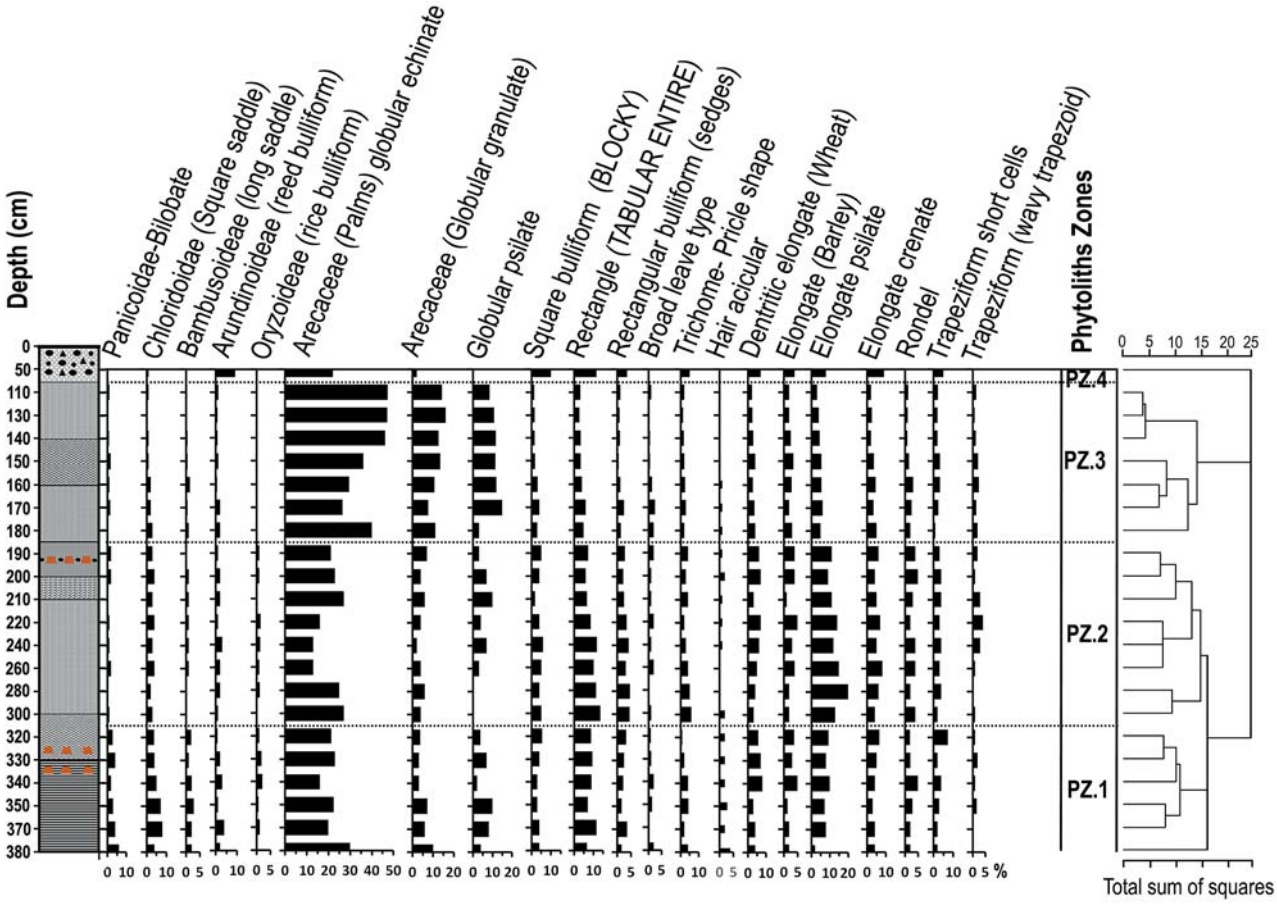


Fig. 3. Phytoliths stratigraphy of Core 1, showing Phytolith zones (drawing A.A. Zalat)

phytoliths were carried out using an Optika light photomicroscope with a digital camera and under oil immersion with differential interference contrast at 1000× magnification. Phytoliths were identified and classified according to the system proposed by Lu et al. (2006) and described according to the International Code for Phytolith Nomenclature (ICPN1.0) (e.g. Twiss 1992; 2001; Madella et al. 2005).

For numerical analysis, the phytolith counts are based on systematic scanning following standardized transects for each slide. At least 500 phytoliths grains were counted for each sample, which were converted into percentages of each morphotype, and these were plotted as a stratigraphic frequency diagram [***Figs 3 and 4***]. The sandy samples commonly contained fewer phytoliths, so that all found on the slide were counted. The phytoliths concentration was calculated by adding a known concentration of synthetic microspheres to the samples; the result was expressed as a mount of taxa per gram of dry weight (dwg) sediment. Furthermore, the relative frequencies of the identified taxa for each core were processed using the computer program PAST (Hammer, Harper, and Ryan 2001) to recognize the hierarchical cluster analysis, which was used to distinguish the phytoliths zones (PZ). Cluster analysis was performed using Euclidean distance measure and the average clustering method of the investigated samples.

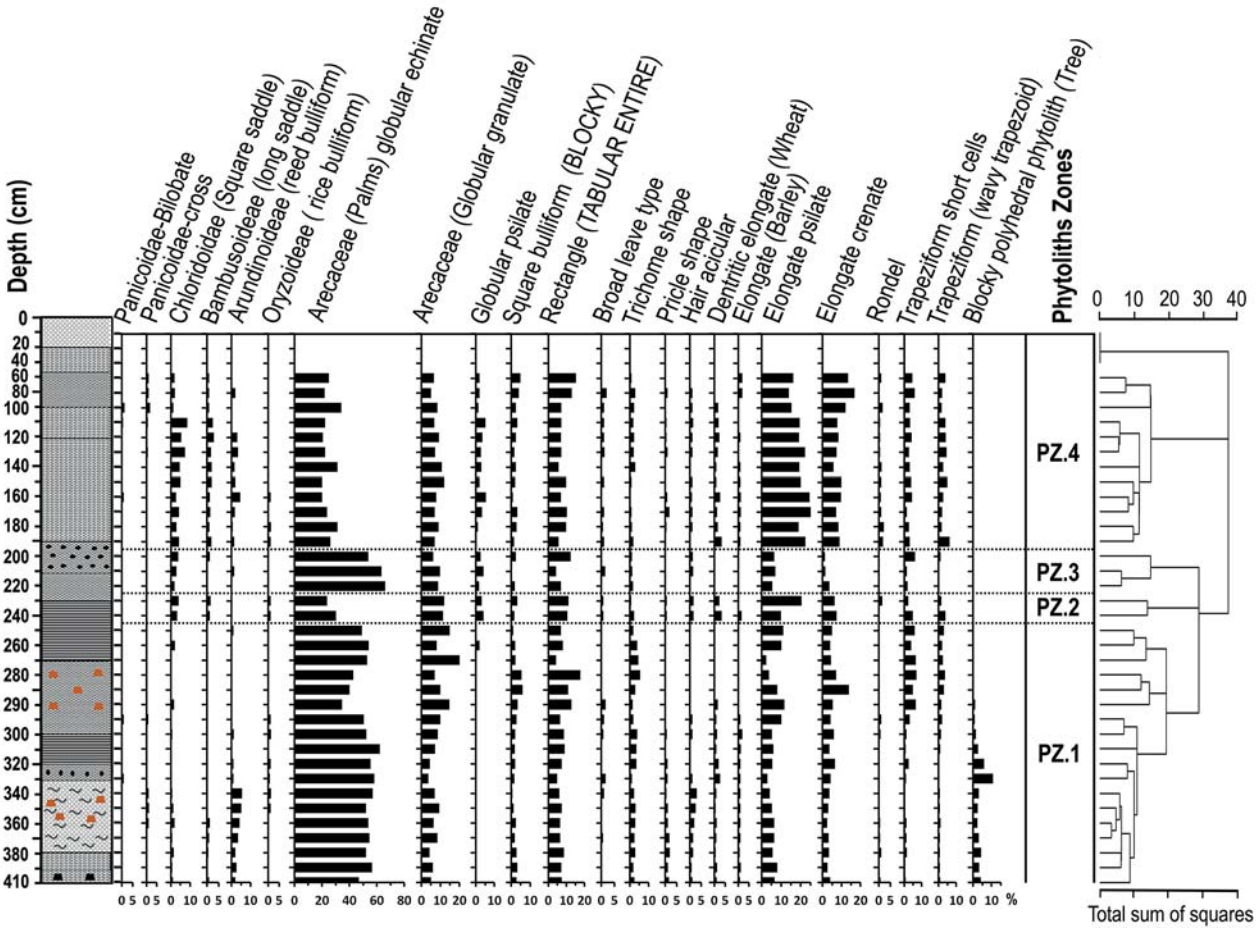


Fig. 4. Phytoliths stratigraphy of Core 2, showing Phytolith zones (drawing A.A. Zalat)

Results

Phytoliths analysis

A great diverse assemblage of phytoliths has been recovered from the studied profile sections. A total of 32 phytolith morphotypes were recognized and most of them are attributable to grasses (Poaceae). The encountered phytoliths are classified based on their shape and are categorized as different morphotypes using the standard classification methods (e.g. Twiss 1992; 2001; Madella et al. 2005). Grass short cell phytoliths are classified according to the definitions represented in several literature (e.g. Mulholland 1989; Fredlund and Tieszen 1994; Kondo, Childs, and Atkinson 1994; Alexandre et al. 1997; Lu et al. 2006; Li et al. 2010), as well as the descriptions provided by the International Code for Phytolith Nomenclature (Madella et al. 2005).

In general, the documented phytoliths were categorized into four major taxonomic plant groups: grasses (Poaceae), Arecaceae (Palmae), trees, and others. The family Poaceae including both short and long-cell forms, which are recorded frequently and covering seven subfamilies: Panicoidae, Chloridoidae, Festucoidae, Pooideae, Oryzoideae, Bambusoidae, and Arundunoidae. The grass silica short cells (GSSC) are grouped into different morphotypes, including the subfamilies

Panicoidae, Chloridoidae, Bambusoideae, Pooideae, and other GSSC morphotypes like elongate crenate and elongate smooth. Another characteristic morphotypes produced by the grasses other than GSSC is the long cell morphotype of subfamilies Arundinoideae, Oryzoideae, and broad leave type.

The recognized morphotypes including cross and bilobate short cells occur dominantly in the Panicoideae grass and the short saddle morphotypes are produced by the Chloridoideae grass, the long saddle morphotypes are formed by the Bambusoideae types (Fredlund and Tieszen 1994; Kondo, Childs, and Atkinson 1994). Both Rondel and Trapeziform short cell morphotypes are mainly produced by the Pooideae grasses (Twiss, Suess, and Smith 1969; Kondo, Childs, and Atkinson 1994). Other phytolith morphotypes, produced in the epidermis of grasses were recorded such as the acicular hair cell morphotype originating from micro-hair or prickles (Kaplan, Smith, and Sneddon 1992). In addition, another characteristic morphotypes produced by the grasses (other than GSSC) is the long cell morphotype regarded as bulliform phytoliths such as Arundinoideae (reed bulliform), Oryzoideae (rice bulliform), in addition the square bulliform, rectangle (tabular entire), elongate sinuate (elongate crenate), and elongate pasilate and broad leave type. The elongate phytoliths are recovered in abundance from species of Poaceae, however, they are found in low abundance in some herbaceous dicots, woody dicots (Wilbur 2013).

The Pooideae subfamily, which includes domestic cereals such as wheat and barley, among other taxa. Their phytoliths included frequent abundance of Triticum aestivum (bread wheat), Triticum dicoccum (emmer wheat), infrequent occurrence of Triticum durum (hard wheat), frequent abundance of Hordeum vulgare (barley), beside scarce occurrence of Maize and Rice (Oryza-type).

The non-Poaceae phytoliths have great abundance in the studied cores sections over the Poaceae forms. The Globular echinate morphotype that are produced by subfamily Arecoideae of family Arecaceae (Palmae) (Runge and Fimbel 1999; Vrydaghs and Doutrelepont 2000) has a maxima abundance accompanying by common occurrence of Globular granulate morphotypes that are produced also by family Arecaceae and in the wood of tropical trees and shrubs and the Globular psilate that is formed in the epidermis of leaves and in parenchyma cells of dicotyledons and wood (Scurfield, Anderson, and Segnit 1974; Kondo, Childs, and Atkinson 1994). The other non-Poaceae taxa comprising infrequently occurrence of the rectangular with cone-like projections and hat-shaped morphotypes of Cyperaceae (sedges). The Broad-leaved types were represented by elongate geniculate and blocky polyhedral (tree).

Phytoliths stratigraphy

Based on the relative abundance with major changes in the ratios of phytoliths along the studied two core sections and constrained cluster analysis, each core is divided into distinctive phytoliths stratigraphic zones [see ***Figs 3 and 4***].

Core 1

- PZ. 1, at the lowermost depth (310–400 cm): Globular echinate of Arecaceae dominates, accounting for almost 17–30% of the total assemblage, followed by a common occurrence of tabular-rectangle morphotype (entire, ca 5–12%), and frequently occurrence of elongate

psilate, elongate crenate, globular psilate and globular granulate of Arecaceae. Pooideae including both Trapeziform phytoliths and rondel morphotypes have occupied infrequently abundance ca 3–8% of the assemblage, while the Panicoideae and Chloridoideae are presented in low amounts. Phytoliths concentration is generally low in this zone.

- PZ.2 (190–310 cm): Gradual increase in phytoliths concentrations was observed. Arecaceae (Palms) globular echinate continuous in their great abundance (14–30%), accompanied by common occurrence of elongate psilate morphotypes and tabular-rectangle morphotype. Pooideae initially increases associated with decreasing abundance of Panicoideae bilobate, Chloridoideae and broad leave type. Festucoideae, and Bambusoideae (long saddle) subfamilies taxa are generally recorded in low numbers throughout this zone.
- PZ. 3 (100–180 cm): Abrupt increase in the phytoliths concentrations happened concurrent with a marked decline in abundance of Festucoideae characteristic of this zone. Phytolith assemblages were characterized by high abundance of Arecaceae (Palms) globular echinate, associated with common occurrence of Arecaceae (Globular granulate) and Globular psilate morphotype. Panicoideae, Pooideae, and other non-diagnostic Poaceae phytoliths were recorded infrequently. Woody phytoliths from broad-leaved trees, Trichome, and Fern-type geniculate accounted for a very low proportion of the total phytoliths.
- PZ.4 (50–90 cm): The top part of the core section is characterized by relatively low phytoliths concentrations. Phytoliths are characterized by a significant increase in the proportions of bulliform morphotypes including Arundinoideae (reed bulliform), square bulliform and rectangular bulliform. The elongate morphotypes are represented by frequent occurrence of Dendritic elongate (Wheat), elongate psilate (Barley), and elongate crenate. The Panicoideae-Bilobate, Chloridoideae, Bambusoideae (long saddle) and Globular psilate are distributed scarcely. The percentages of non-diagnostic Poaceae and woody phytoliths were recorded infrequently.

Core 2

- PZ. 1 (250–410 cm): The phytolith concentration is high at the depth of 290–400 cm and decreased relatively at the top of this zone (250–285 cm). Arecaceae (Palms) globular echinate dominates this zone, with frequency rate almost 38–60% of the total assemblage, associated with a common occurrence of Arecaceae (Globular granulate, ca 4–20%), tabular-rectangle morphotype (ca 5–17%) and frequently occurrence of elongate psilate morphotype. Pooideae subfamily including both Trapeziform and rondel morphotypes have occupied infrequently abundance ca 2–6.5% of the assemblage. The Panicoideae, Chloridoideae, Festucoideae, Bambusoideae (long saddle), and Oryzoideae (rice bulliform) subfamilies taxa are generally recorded sparsely, while the Arundinoideae (reed bulliform) is reported infrequently at the lower part of the zone (330–410 cm). The proportions of non-diagnostic Poaceae and woody phytoliths were recorded in low amounts.
- PZ. 2 (230–240 cm): Short interval characterized by moderate concentration of phytoliths taxa. Arecaceae (Palms) globular echinate decreased relatively in its abundance, but continue dominant (22–30%), associated with common occurrence of Arecaceae (Globular granulate, ca 12–13%), tabular-rectangle morphotype (ca 10–12%) and elongate psilate morphotype

(10–21%). The subfamilies Panicoideae, Pooideae, Bambusoideae (long saddle), Arundinoideae (reed bulliform) and Oryzoideae (rice bulliform) are recorded scarcely, while Chloridoideae represented in low abundance. The dendritic elongate form of Wheat occurs in low frequency and elongate type of Barley is very limited.

- PZ. 3 (200–220 cm): High increase in phytoliths concentration concurrent with abrupt increase in abundance of Arecaceae (Palms) globular echinate with frequency rating ca 55–64% of the total assemblage. The Arecaceae (Globular granulate), tabular-rectangle and elongate psilate morphotypes are recorded frequently. Other phytoliths morphotypes are distributed sparsely.
- PZ. 4 (50–190 cm): Maximum increase of phytoliths concentration covered the depth of 170–190 cm at the base of this zone and gradually decreased in their concentration upwards. Marked decline in abundance of Arecaceae (Palms) globular echinate, which remain common ranging between 21 and 32%, simultaneous with abrupt increase in abundance of elongate psilate morphotype (ca 15–30%) of the total assemblage. The Arecaceae (Globular granulate), tabular-rectangle and elongate crenate morphotypes are distributed frequently. Pooideae is represented with significant occurrence of Chloridoideae, Bambusoideae (long saddle), and Arundinoideae (reed bulliform). However, the woody phytoliths were recorded in low abundance.

Date palm phytolith

The Arecaceae are a botanical family of perennial climbers, shrubs, acaules and trees commonly known as palm trees. This family owing to its historical usage, is alternatively called Palmae that includes the well-known species such as date palm, coconut, and oil palm (Elaeisguineensis) (Sayan 2001). Palms are monocotyledonous plants that are essential ingredients of tropical ecosystems, and many occurred in higher altitudes have more constrained environmental ranges (Huisman, Raczka, and McMichael 2018). They are geographically widespread in Africa, Asia, Australia, Europe, North, Central and South America (e.g. Harley 2006; Dransfield et al. 2008). They are known to be productive phytolith producers, which existed in their vegetative parts (Morcote-Ríos, Bernal, and Raz 2016), and can often be identified to the subfamily or genus level (Piperno 2006; Huisman, Raczka, and McMichael 2018). History of palm trees are dating back to the initiation of human eras and occurred in dry warm climate zones that extend from Senegal in Africa to the Andean Basin North of the Equator. Palm trees tolerate high temperatures reaching up to 50°C without significant damage, however they can grow under varying temperatures, and flowering in areas where shaded temperatures reach at least 18°C, and do not bear fruit unless temperatures exceed 25°C. Increased relative humidity during the flowering period can lead to a higher incidence of diseases affecting flower inflorescences (Ahmed 2024).

The date palm is one of the most important trees in subfamily Arecoideae that exhibit remarkable tolerance to high temperatures and thriving in arid conditions. It is adapted to areas with long hot summers, little rain and low humidity, but with abundant underground water (Allbed, Kumar, and Shabani 2017). It is the only indigenous wild desert plant definitely domesticated in its native harsh environment. The date palm was responsible for opening the vast desert territories for human activity and the development of oasis agroecosystems.

13 palm species belonging to eight genera are documented in Egypt, and they grow naturally or are cultivated in all coastal and inland desert regions (Oases), the Nile Valley and Delta (Amer and Zahran 1999). The most significant one is the date palm that represented by Phoenix dactylifera. It is one of the most important tree crops that occurs naturally at springs and oases in the arid regions and desert areas of Northern Africa, Southern Asia and the Middle East (Hodel and Pittenger 2003). Throughout history Phoenix dactylifera has played an important economic role in human societies of the regions and continues to do so in the present (Damick 2019).
The most abundant phytolith assemblage recovered in the studied samples was the Globular echinate morphotype [see ***Figs 3 and 4***] that are produced by family Palmae, and reflecting a significant distribution of Phoenix dactylifera and Phoenix reclinate. The emergence of P. dactylifera phytoliths in great abundance are considered direct evidence for date palm from Byzantine period archeological context and representative of the amount of palm used in Philoxenite. Moreover, their high abundance reflect a denser date Palms cover close to Philoxenite and their phytoliths were directly incorporated into this site after the *in situ* decay of a date palm leaf, or transported from a finished products made of date palm fronds or trunk fibers, such as storage baskets, which were used with foodstuffs.

Phytolith as paleoclimate index

Phytoliths have been widely used as bio-indicators for detection of past vegetation and climatic changes (Barboni et al. 2010; Sánchez, González, and Genise 2010; Novello and Barboni 2015). Reconstruction the past climate variability based on the proportion of different phytolith morphotypes that signify either cool and dry or warm and wet conditions was performed by several authors (Wang, Liu, and Zhou 2003; Bremond et al. 2005: 2; Lu et al. 2006; 2007; Fisher et al. 2013; Zuo et al. 2021). The phytolith morphotypes bulliform, square, and rectangular forms are completely derived from Poaceae and are mainly deposited in bulliform cells of the subfamilies Oryzoideae, Arundinoideae, and Panicoideae. Several studies have explained that a high production of bulliform cells is related to higher water availability (Fisher et al. 2013), and thus can be used as an index of water stress (Bremond et al. 2005) or warm and wet climate (Wang, Liu, and Zhou 2003). The morphotypes of long saddle and bamboo bulliform, produced by the Bambusoideae subfamily, and the saddle, reed bulliform from Arundinoideae subfamily, are good indicators of warm and wet climate. Broad-leaved phytoliths are produced by many tropical or subtropical broad-leaved trees. Their abundance steadily increases toward warmer and wetter regions (Lu et al. 2006; 2007), therefore they can be used as indicators of wet and warm climates (Zuo et al. 2021). The bilobate and cross short cell morphotypes occur dominantly in the Panicoideae grass subfamily chiefly C4 grasses (Fredlund and Tieszen 1994; Kondo, Childs, and Atkinson 1994) and adapted to warm and humid climate conditions or in drought affected regions with high soil moisture conditions (Twiss 1980; Scott 2002). The short saddle GSSC that produced in large quantity by grasses of subfamily Chloridoideae dominantly C4 are indicators of warm and dry climate where the soil moisture conditions are extremely low (Livingstone and Clayton 1980). Both Rondel and Trapeziform short cell morphotypes (wavy-trapezoid and wavy-narrow-trapezoid), are mainly produced by the Pooideae grasses subfamily (Twiss, Suess, and Smith 1969; Mulholland 1989; Kondo, Childs, and Atkinson 1994), and mostly adapted to cold dry climate

and considerably high soil moisture conditions (Livingstone and Clayton 1980; Wang and Lu 1992). Based on the variations in proportion of phytoliths morphotypes two phytolith climate indices were recognized: Climate index (Ic) and Aridity index (Iph), which are used to interpret the climatic significance of the phytolith assemblages.

Climate index (Ic)

The differences in the frequency rate of phytoliths morphotypes belonging to Pooideae, Chloridoideae, or Panicoideae subfamilies can be used to estimate palaeoclimatic indices based on ratios of C3 and C4 grasses (Twiss 1992; Barboni, Bremond, and Bonnefille 2007), where the distribution of C3 and C4 grasses are mainly driven by temperature. This index is termed the Ic index, which can be used as a climatic temperature index. It is calculated by the percentage of Pooideae relative to the sum of Pooideae, Chloridoideae, and Panicoideae grasses.

$$\text{Ic \%} = \text{Pooideae} / (\text{Pooideae} + \text{Chloroidoideae} + \text{Panicoid}) \times 100$$

The Pooideae phytoliths comprised rondel, trapeziform short cell, and trapeziform polylobate morphotypes, which can be compared with Chloridoid (Saddles) and Panicoid (Bilobates, Crosses, and Polylobate) morphotypes. The transition zone between C3 and C4 grasses has been placed between 45 and 55%. High values from this ratio suggest a cool climate and low values suggest a warm and humid to arid climate. If the values over 55% of the Ic index indicate C3-dominated grasslands, and values below 45% indicate C4-dominated grasslands.

Aridity index (Iph)

The aridity index (Iph) is proposed to infer paleoclimate in the Sahara region (Diester-Haass, Schrader, and Thiede 1973). This index is calculated by the ratio of saddle morphotype relative to the sum saddle, bilobate dumbbell and cross morphotypes. Twiss (1992) expressed this index as a ratio of chloridoid versus chloridoid and panicoid phytolith morphotypes. The use of saddle morphotype and its significance in calculating the Iph index has been discussed in detail by many authors (Alexandre et al. 1997; Lu and Liu 2003; Li et al. 2010; Saxena, Prasad, and Singh 2013; Prasad et al. 2014). As in the Ic index, the transition zone is located between 45 and 55%. The low values of Iph are associated with warm and humid/wet conditions and higher values of Iph with warm and arid conditions [***Figs 5 and 6***]. Moreover, in the dataset of phytoliths of Diester-Haass, Schrader, and Thiede 1973, the Iph value reaches up to 40 and covering the transition zone indicating extreme aridity.

In the current study, due to the low abundance of Pooideae, Chloridoideae and Panicoid phytoliths morphotypes in the studied samples, the climate (Ic) and aridity (Iph) indices are calculated by the ratio of phytoliths morphotypes that distinctive of warm climate (e.g. bilobate and cross of Panicoideae [***Fig. 7***], Bulliform phytoliths of the subfamilies Oryzoideae, Arundinoideae, long saddle of Bambusoideae subfamily and Broad-leaved phytoliths) to phytoliths of cold climate (e.g. Rondel and Trapeziform short cell morphotypes of the Pooideae subfamily) [***Fig. 8***]. As well as the ratio of phytoliths distinctive of wet climate is calculated in relation to morphotypes diagnostic of arid climate.

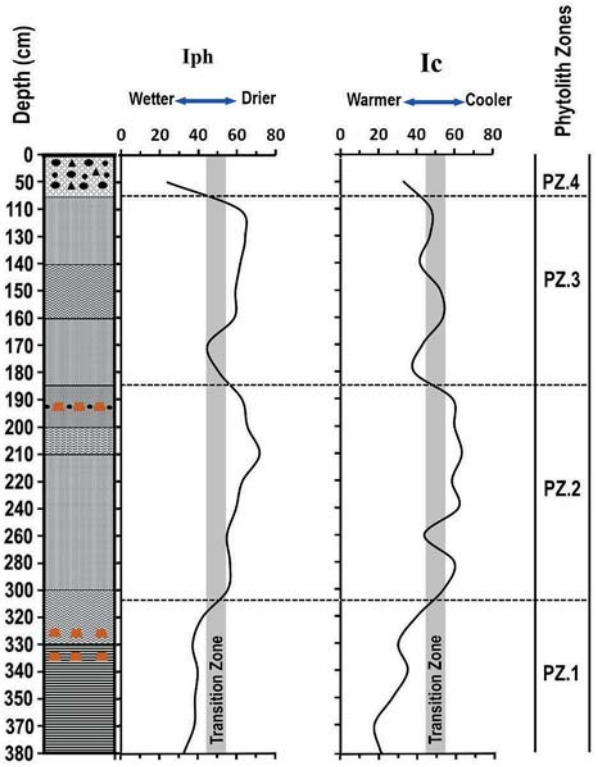


Fig. 5. Phytolith climate indices (Ic-Iph) of Core 1 (drawing A.A. Zalat)

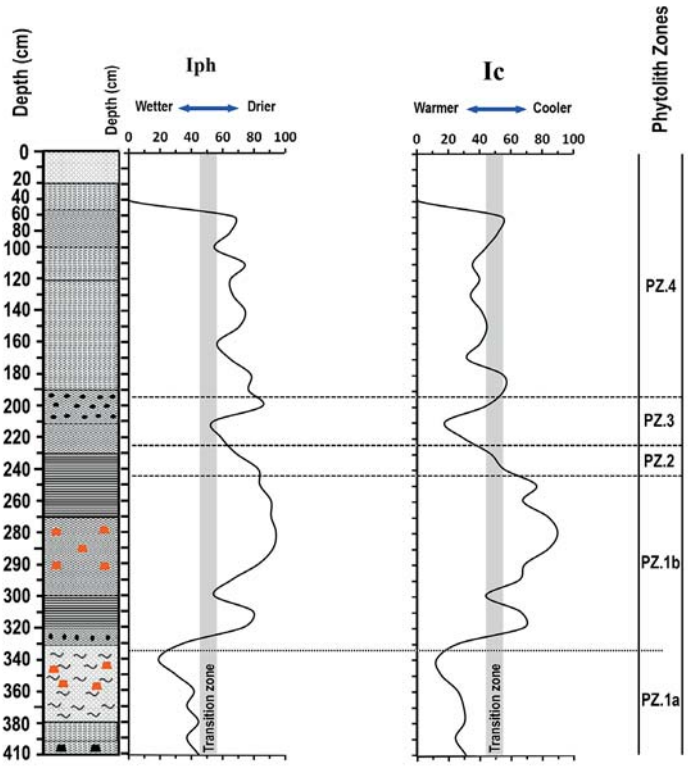


Fig. 6. Phytolith climate indices (Ic-Iph) of Core 2 (drawing A.A. Zalat)

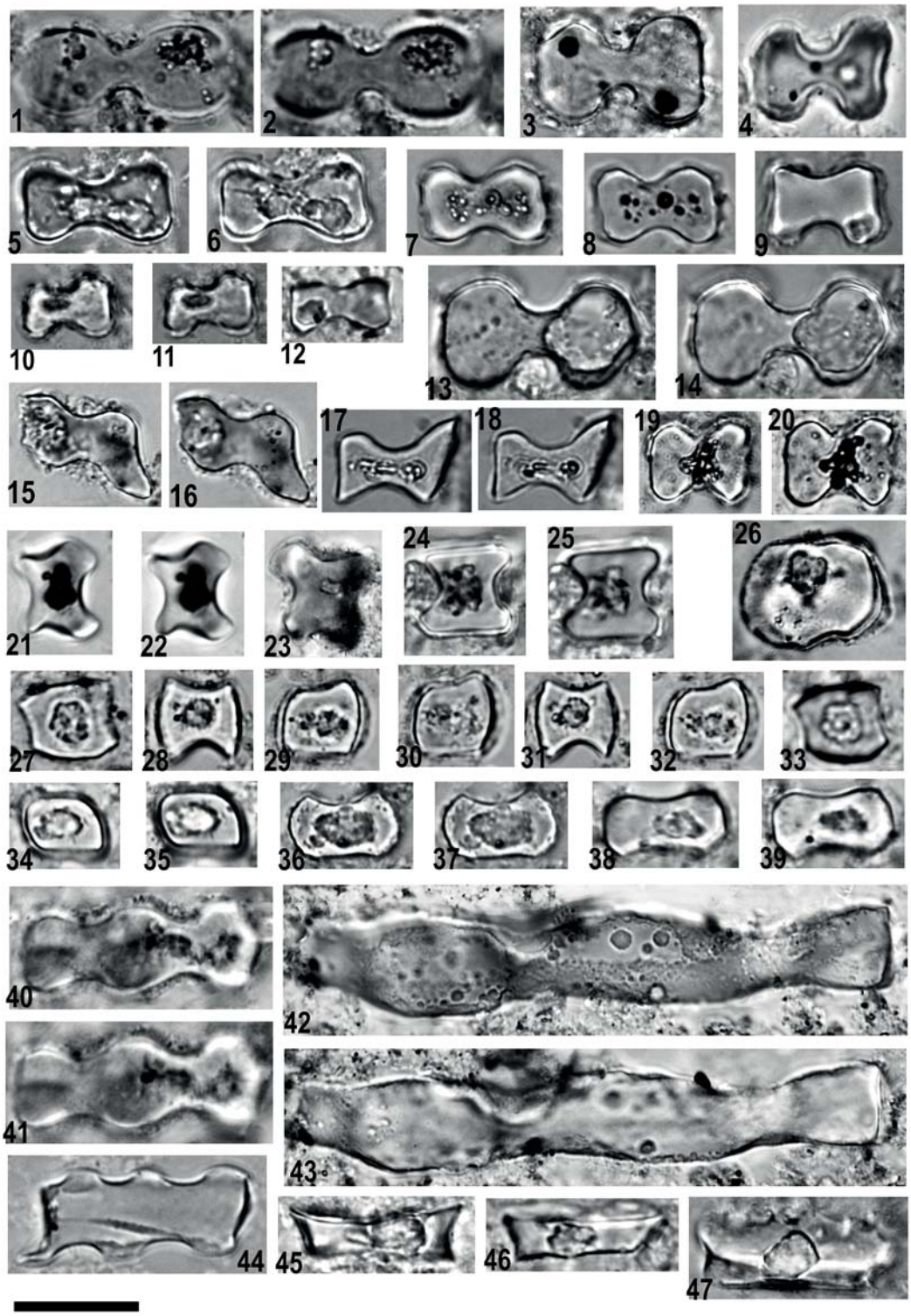


Fig. 7. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–18: Bilobate (dumbbell) short cell; 19–25: Cross shape; 21–23: Cross shape of Maize; 26–35: Saddle short cell (26: GSC phytolith type from the wheat); 36–39: Saddle long cell; 40–43: Polylobate-asymmetric trilobate; 44: Polylobate-trapeziform; 45–47: Trapeziform short cell. Scale bar 10 μm (photo A.A. Zalat)

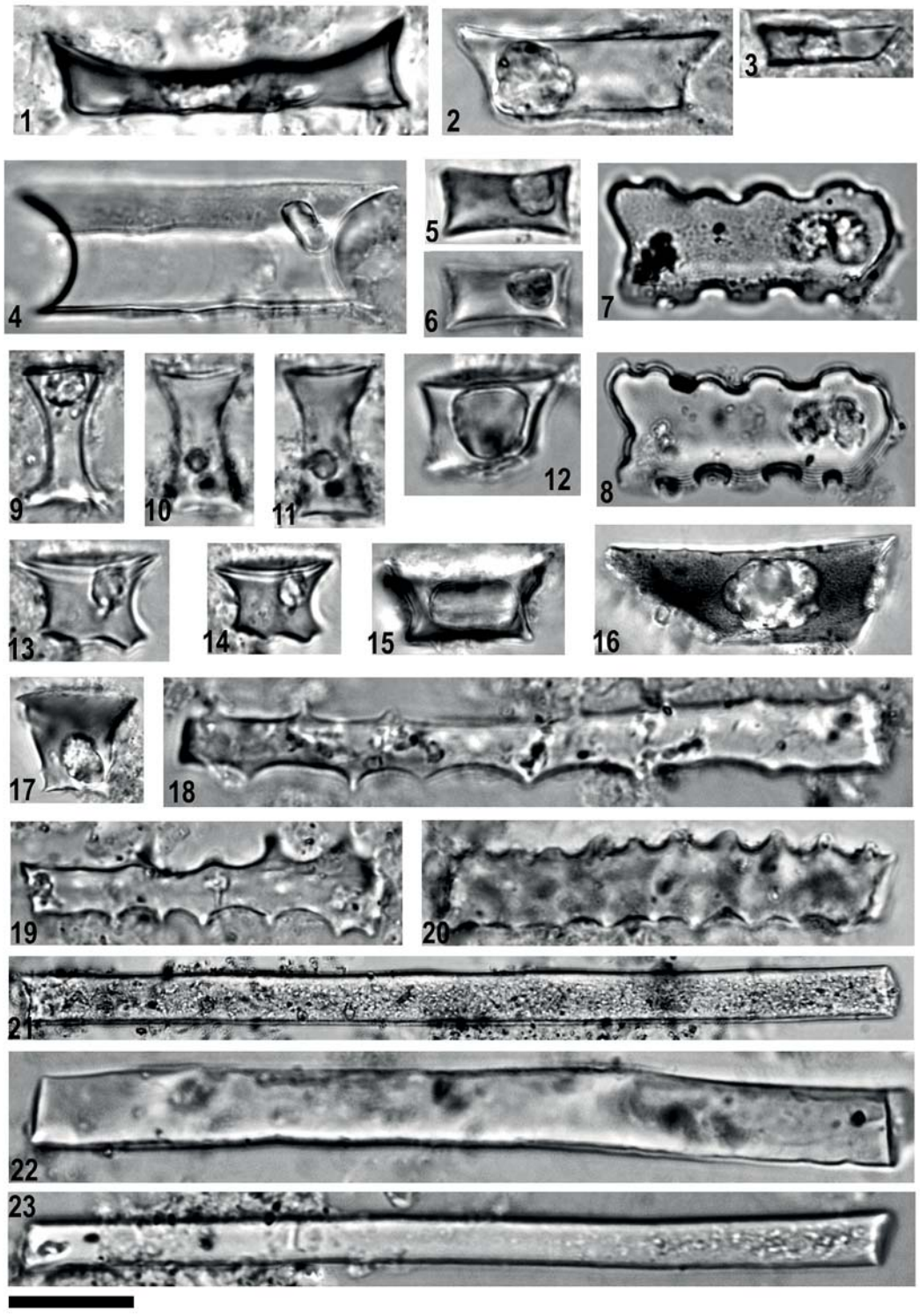


Fig. 8. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–6: Trapeziform short cell; 7–8: Polylobate-trapeziform; 9–17: Rondel; 18–19: Dendritic elongate; 20: Dendritic trapezoids; 21–23: Elongate smooth (elongate entire). Scale bar 10 μm (photo A.A. Zalat)

Discussion

The phytoliths analysis provided important data on the paleovegetation and ecosystem changes at Philoxenite and its surrounded area, which are mainly related to environmental changes, climate conditions and human influences during the Byzantine time. The marked variations in the composition and the relative abundance of the phytoliths assemblages along the studied two cores sections may reflect changing spatial distribution of plant resources at the archeological site and explain direct and indirect evidence for paleovegetation cover that varied in response to climate changes at different time-scales. In addition, increased abundance of phytoliths taxa and the variations in their relative frequency may relate to increased human influences and prolonged human occupation during the Byzantine periods.

The most abundant phytolith morphotypes in the studied samples were the Globular echinate, and Globular granulate forms of the Arecaceae family which denotes to Palms tree. The second significant abundance was the Poaceae family varieties that comprising the elongate morphotypes with variations included indented, sinuous, smooth, spiney, and decorated [***Figs 8 and 9***]. The differences in the abundances of elongate morphotypes in the studied sediments may be related to natural and/or anthropogenic disturbance on the landscape. The woody phytolith morphotypes that occur in forest soil (Gao et al. 2018), present in low ratio in the detected assemblage indicates a low spread of broad-leaved trees. Poaceae grass communities included the Pooideae phytoliths showed significant abundance along the studied profile, suggesting possible short-term increases in Pooideae extent and distribution. Bambusoideae phytoliths morphotypes are decreased in their relative abundance, indicating a decline in bamboo woodland. Panicoideae phytoliths showed limited abundance in PZ.1/Core 1 and then declined in their abundance upward and scarce occurrence along the Core 2 suggesting the impact of climate change and trend toward the hot dry conditions.

The lower part of both studied cores is covered by the phytolith zone (PZ.1/Core 1, 310–380 cm depth), and the phytolith subzone (PZ.1a/Core 2, 340–410 cm depth). The phytolith assemblage through this period contained a significant abundance of bilobate morphotype of Panicoideae grass, long saddle of Bambusoideae, and reed bulliform from Arundinoideae in Core 1, and a significant occurrence of reed bulliform from Arundinoideae and blocky polyhedral type [***Figs 10 and 11***] in Core 2. This phytolith assemblage reflects spread grass vegetation in Philoxenite and adjacent area during the wet- warm climate conditions. The Iph value shows a general trend towards wetter conditions, and the Ic values are within a warmer zone of the index [see ***Figs 5 and 6***]. A considerable abundance of the bulliform cells is related to increase freshwater accessibility (Fisher et al. 2013) that used for the agricultural fields. This may correspond with the construction of the irrigation canals at the Philoxenite through the second half of the 6th century AD (Gwiazda, Kotarba-Morley, and Derda 2024; Zalat et al. 2025). The presence of similar agricultural facilities has also been detected at other sites dating to the Byzantine period that are located on the Lake Mariout shores (Blue and Khalil 2010; Nenna 2015), indicating a regional increase in the importance of land cultivation. Our phytoliths findings coincide well with diatom results by Zalat et al. (2025), from the same intervals that explained a great abundance of the eutrophic planktonic diatoms taxa which displays a freshwater environment enriched by nutrients with the rising water level of Mariout lake during moderate windy conditions and wet warm

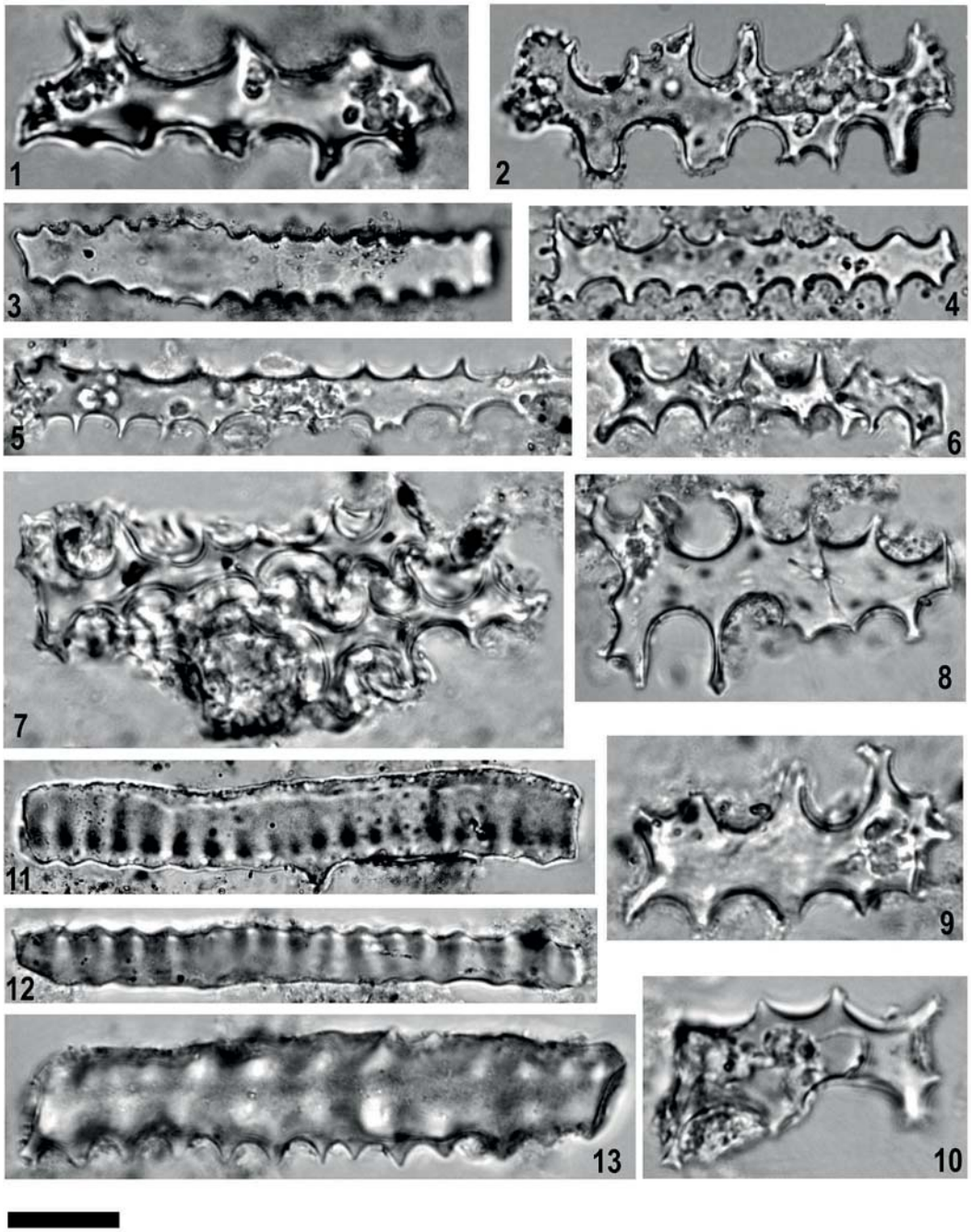


Fig. 9. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–7: Triticum aestivum (1, 2, 4–7: Dendritic long cell phytolith from inflorescence tissue of bread wheat; 3: Long trapezoid phytolith from lamina tissue); 8–10: Triticum dicoccum (Dendritic phytoliths from inflorescence tissue of emmer wheat); 11–12: Hordeum vulgare (tracheids phytolith of barley); 13: Hordeum vulgare (trapezoid dentate phytolith of barley). Scale bar 10 μm (photo A.A. Zalat)

climate. Increased nutrient input to the Mariout lake (Zalat et al. 2025) is attributed to enhanced human activities, which is demonstrated by the presence of the ceramic assemblage at the depth of 3.30–3.40 which is mainly dated to the Byzantine time (5th–6th centuries AD).

The phytolith assemblage shows evidence of vegetation growing in the vicinity of the Philoxenite. Evidence of human activity is recorded in the core sequences by the occurrence of artifacts with diverse pottery components at the depth of 1.90–2.00 m/Core 1, and 2.70–2.95 m/Core 2. The archaeological records in Core 2 indicate that the ancient canal was built no earlier than the mid-6th century AD and it was abandoned no earlier than the 7th century AD (Gwiazda, Derda, and Barański 2022; Gwiazda 2023b; 2023a), probably during the later 7th century AD The onset of the core at a depth of 3.40–4.10 m (PZ.1a) is dominated by Globular echinate morphotype [***Fig. 12***] that are produced by family Palmae and reflecting a significant distribution of Phoenix dactylifera and Phoenix reclinate accompanied by a frequent abundance of reed bulliform of Arundinoideae that reflect warm humid conditions. The documented pottery from this level gives a *terminus post quem* in the second half of 6th century AD The phytolith assemblage displays human occupation in the Byzantine time. This zone is correlated well with the PZ.1/Core 1, which explains a dense cover of Palm tree close to Philoxenite during the Byzantine period (ca 1500–1450 BP). This date (1450 BP) is more consistent with the dating of pottery that recovered from the same levels.

A sharp excursion towards drier conditions is followed directly the wet period at a depth 300 cm/Core 1, and 320 cm/Core 2. The humid Panicoideae and bulliform morphotypes from Arundinoideae displays a marked decreasing trend with limited abundance upwards of the studied two cores accompanied by a significant increase in the proportions of cold arid grass community of Pooideae subfamily throughout the phytoliths zones (PZ.2/Core 1 and PZ.1b/Core 2), which indicative of cold and dry climate where the soil moisture conditions are very low. This is simultaneous with increased abundance of elongate and tabular rectangular phytolith morphotypes. The Iph value shows a general trend towards aridity conditions, and the Ic values are within a transitional zone of the index in PZ.2/Core 1 that reflets trend towards a relatively cooler condition, while Ic values are located in the cooler zone in PZ.1b/Core 1, with a short trend towards the relatively cooler and drier is noticed at depth 300 cm. This cold-arid phase continues with relative increase in temperature through the upper part of the phytolith zone (PZ.2) of Core 1 and the phytolith zone (PZ.2) of Core 2.

A marked change in climate conditions was observed by a continuous increase in temperature towards warmer and wetter condition characteristics the lower part of PZ.3 in Core 1 (depth 170–180 cm) and PZ.3 of Core 2 (depth 200–220 cm). Phytoliths are characterized by a significant increase in the proportions of warm wet reed bulliform of Arundinoideae subfamily, square bulliform and rectangle morphotypes concurrent with a marked decline abundance of cold arid Pooideae phytoliths. The drier conditions prevailed again through the relatively warm climate that covered PZ.3 of Core 1, and PZ.4 of Core 2. The most likely cause of gravel deposits at the depth of 190–210 cm/Core 2 is therefore interpreted to be related to the drying of the climate. The warm arid phytoliths of Chloridoideae subfamily have significant occurrences.

The low organic content in the recovered sediments is therefore tentatively interpreted as another indicator of drier conditions. No diatoms are recorded throughout this interval with abundance of the brackish water diatom taxa towards the upper parts of the studied cores (Zalat

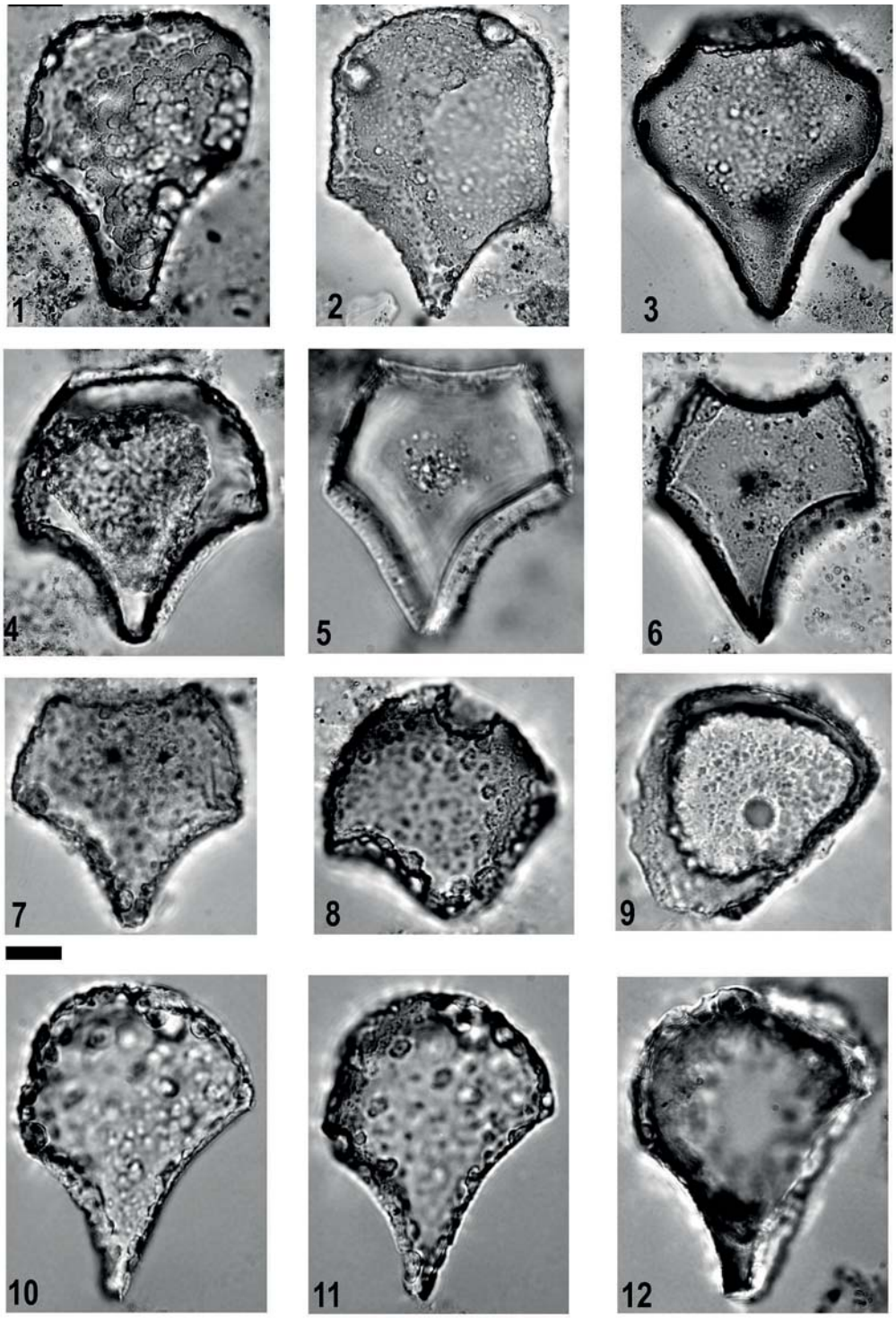


Fig. 10. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. Different types of Cuneiform bulliform cell from reeds. 1–2: Phragmites australis; 3: Arundo formosana; 4: Arundo donax; 5–7: Cynodon dactylon (different types of bulliform cells in leaf blade); 8–9: Scutiform-bulliform from Arundinoideae; 10–12: Fan-shaped, decorated cuneiform bulliform phytoliths of rice (Oryza-type). Scale bar 10 μm (photo A.A. Zalat)

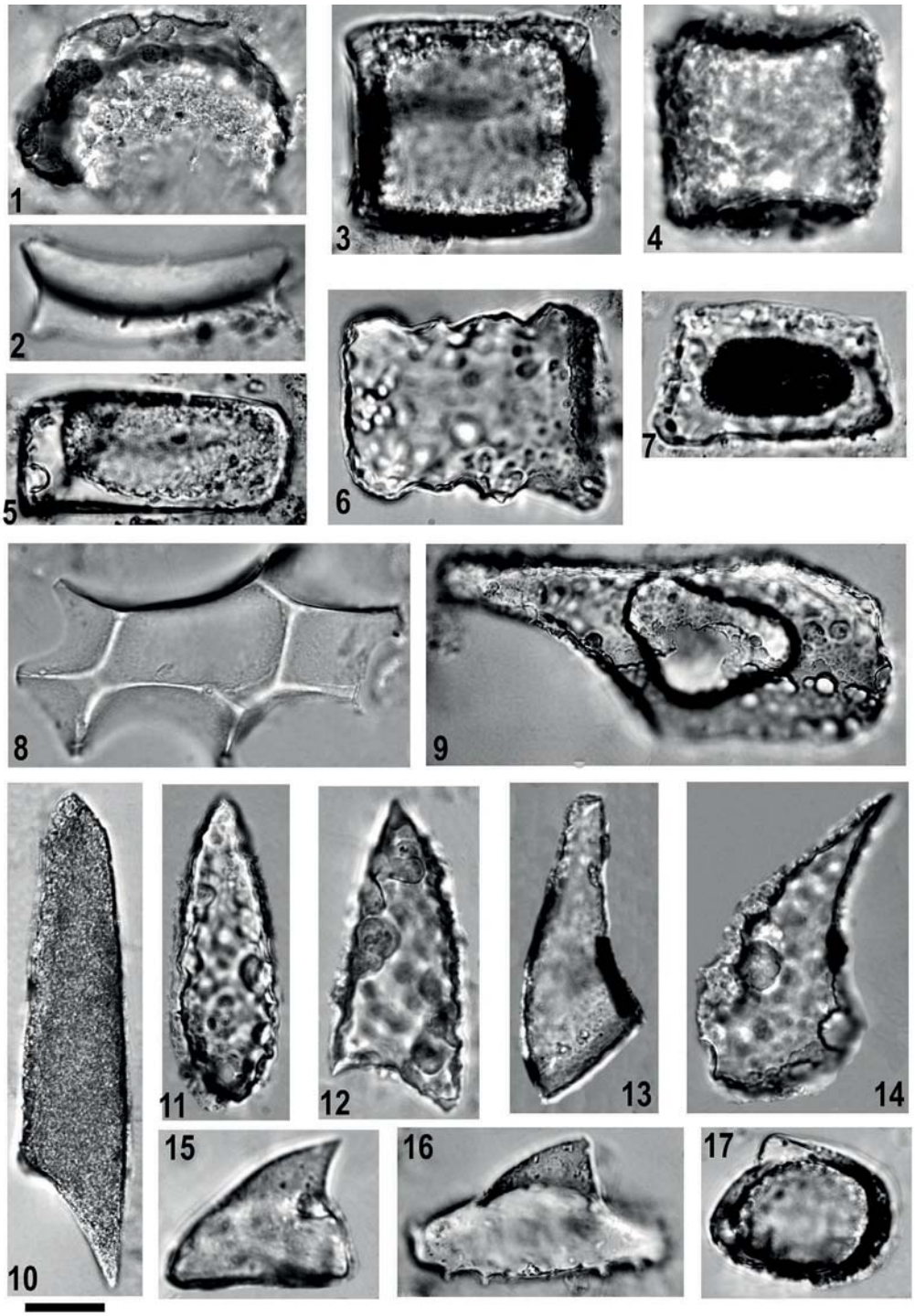


Fig. 11. Light microscopic photomicrographs of various morphotypes of phytoliths recovered from the studied Philoxenite sections. 1: Fan-shaped phytolith of Oryza-type; 2: Double-peaked-shape glume cell of Oryza-type; 3–4: Square, silicified bulliform cell (blocky); 5–6: Rectangular bulliform; 7: Rectangular bulliform (sedges); 8: Blocky polyhedral; 9: Acicular-prickle hair phytolith (Acute bulbosus); 10: Acicular hair lanceolate cell (Acute bulbosus); 11–12: Acicular hair cell; 13–15: Trichomes-prickle hairs from the leaves of Hordeum vulgare; 15–17: Hat-shaped morphotypes of Cyperaceae. Scale bar 10 μm (photo A.A. Zalat)

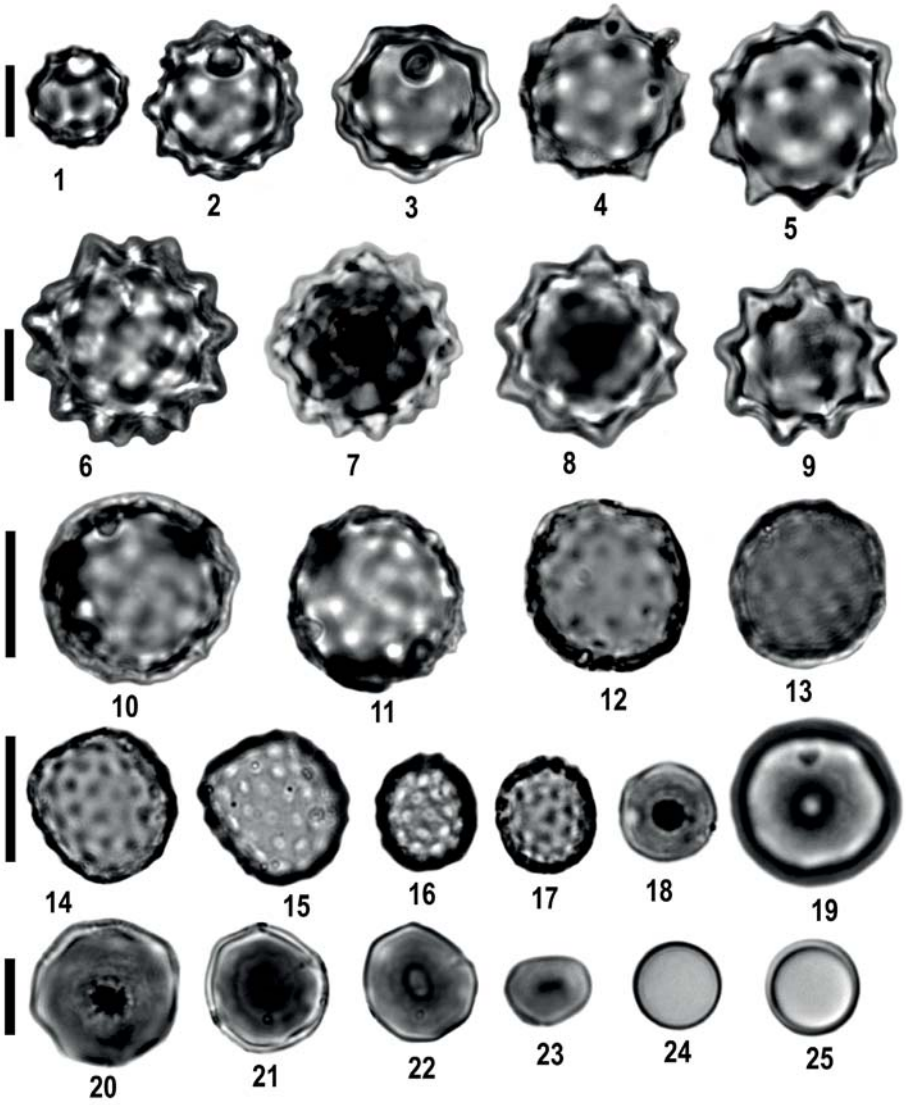


Fig. 12. Light microscopic photomicrographs of various Globular morphotypes of phytoliths recovered from the studied Philoxenite sections. 1–9: Globular echinate (Globular crenate from Aracaceae, Palm); 10–17: Globular granulate; 18–25: Globular psilate (smooth). Scale bar 10 μm (photo A.A. Zalat)

et al. 2025), which is another indication of drier conditions with lowering water level of Mariout Lake during early Islamic period (later 7th–8th century AD). The general trend of the Iph value indicates drier conditions and the Ic index demonstrates a warmer trend [see ***Figs 5 and 6***].

The aridification progressed over much of the studied region. The wetness is not noticed in the GSSC phytolith assemblage as the wetter adapted Panicoideae (Twiss et al. 1969) grasses were sparse to absent (PZ.2–3/Core 1 and PZ.1b–4/Core 2). However, the relative increased abundance of Chloridoideae morphotypes supported dry conditions prevailing during the time of deposition. The sediment characters that are composed of sand and coarse fractions explain their source from the adjoining area of the studied site. As aridity continued, due to decreases in the regular monsoon rains, the vegetation decreased and aeolian sands were mobilized in the lack of

vegetation. The sand fractions are increased upwards the studied profiles with increasing grain size deposits (Pebbles and small gravels) at the topmost part of Core 1 (PZ.4 / depth 0–80 cm) may indicate increased erosion, as an effect of a more open landscape. The scutiform-bulliform morphotype, which is obtained from Phragmites australis (reed), is common with other reed phytoliths taxa such as Arundo formosana, Arundo donax that recorded with a considerable percentage indicating a swampy habitat during the deposition of this zone.

The documented phytolith assemblage further included globular echinate phytoliths characteristic of palms (Arecaceae), which formed a large part of the assemblage were present in most samples accompanied by globular granulate and globular psilate morphotypes [see ***Fig. 12***]. The globular echinate phytolith is characteristic of the date palm Phoenix dactylifera, which is native to the area, and is widely distributed along the Mediterranean coast, Nile valley and the Oases in Western Desert. The predominance of this taxon reflects a denser Palm date cover nearby the Philoxenite and the Phoenix dactylifera phytoliths were transferred to the sediments as a result of its many uses by humans' activities. Other palms than Phoenix dactylifera probably contributed to the phytolith assemblages at Philoxenite.

Despite not being common crops, there are some evidences of wheat, barley and rice crops in the studied samples, which are represented by the dendritic elongate phytoliths of wheat, elongate morphotype of Barley [see ***Fig. 9***], bulliform type of rice, fan-shaped phytolith, and ouble-peaked-shape glume cell of Oryza-type [see ***Figs 10 and 11***]. The frequent abundance of wheat-like (Triticeae spp.) and low occurrence of Oryzoideae (rice bulliform) along the studied cores sections may suggests that the Triticeae phytolith and rice grains were incorporated in the archaeological assemblage as a result of cereals consumed by the inhabitants.

Conclusion

The current study provides a new high-resolution phytolith record from sediments recovered from two cores obtained in Philoxenite to reconstruct the past vegetation and climate variabilities during the Byzantine–early Islamic period. The sediment core chronology was based on the ceramic that was found in the sediments. A total of 32 phytoliths morphotypes were identified and classified covering two taxonomic families' groups including Arecaceae and Poaceae with seven subfamiles Panicoidae, Chloridoidae, Festucoideae, Bambusoidae, Arundunoidae, Oryzoideae, and Pooideae. Another characteristic morphotype was broad-leaved trees that reported infrequently. The most abundant phytolith assemblage observed was the Globular echinate morphotype accompanied by a common occurrence of Globular granulate morphotype that are produced by subfamily Arecoideae of family Arecaceae. The marked variations in the composition and the relative abundance of the phytoliths assemblages along the studied two cores sections and the constrained cluster analysis explained four local phytolith zones for each studied profile.

The recognized phytolith assemblage indicated a significant increase in abundance of date palms, represented by a greater abundance of Phoenix dactylifera, which gives evidence of human influences and important economic role in human societies of the regions during the Byzantine period. The Pooideae morphotypes, which are indicative of dry or cold climates, decreased at the base of the studied cores (PZ.1/Core 1 and PZ.1a/Core 2) simultaneously with increasing

abundance of saddle and bulliform phytoliths, indicating a warmer and wetter climate during that period. During early Islamic period, the area was exposed to arid conditions, starting with relatively cold dry phase covering the PZ.2/Core 1 and PZ1b/Core 2, which is characterized by significant occurrence of Pooideae short-cell grasses. The warmer trend increased relatively upwards of the studied cores concurrent with common occurrence of Chloridoideae phytoliths that reflecting hot dry climate, associated with other warm characteristic phytoliths forms.

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MAREOTIS

TAPOSIRIS-ABU MENA-PHILOXENITE

GENERAL PLAN

OF ARCHÆOLOGICAL SITES

DRAFTED BY

ANDRZEJ BRUNO KUTIAK 2022-2023

BASED ON MAPS OF THE SURVEY OF EGYPT 1940 AND 1914

NAMES AND LOCALITIES BASED ON

WOLFGANG MÜLLER-WIENER 1967

LAKE MAREOTIS RESEARCH PROJECT 2007-2010

LE PROGRAMME GEOMAR 2013-2016

AND OWN RESEARCH

SCALE 1:60 000

COORDINATE SYSTEM: EPSG 32635

0 0,5 1 2 km

N

749000 29°35' 750000 751000 752000 754000 29°40'

31° 31°00' 30°25' 30°50'

3432000 3430000 3470000 3480000 3490000 3500000

MEDITERRANEAN SEA

LAKE MARYUT

SITE 201

PHILOXENITE

AKADEMIA

NAGA EL-ZOHRAT

ISLAND

MIT ABUL KOM

SITE 119 SITE 113 SITE 14 SITE 35

AL-GAMAL

SITE 38 SITE 123 SITE 23 SITE 43

HAWWARIYA-SOUTH

QASIMIYA QUARRY

AL-QUSEIR

SITE 18 SITE 16 SITE 15

NAKHEL

SITE 253

SIDI SOLIMAN EL-TAYER

SOLIMAN EL-TAYER

TAHER EL MASRY WINERY

AL-QUASIMIYA

SANYET QASIM EL HAUWARI

TAPOSIRIS MAGNA

KOM BAHIG

KARM EL AGARMA

SIDI HAMID SOLIMAN SHAMATA

SAKEH-HADID

SANYET EL ASHA

KARM SHAHER ROWHOH

SIDI MAHMUD

EZBET FATH ALLAH (BATHS)

WINERY BURG EL ARAB WEST

SIDI ABDALLAH EL-SHAYET

KARM ABU HAMDA

KARM EL BAHMA

KARM KHADR

KARM ISMAIL

KARM IBEIDA

KARM ABU SUWEILIH

KARM EL MASANI

ZAWYET EL MIHEISNI

ZAWYET EL MIHEISNI

KARM KHITAL

KARM ABBAS

KARM EL GUWEIRA

ABU MENA

KARM EL-BARAASI (?) WINERY

KARM EL MUWEILHI

KARM FAYIZ ABU BAKR

KARM AZIZA

KARM GADOURA WINERY

WINERY

KARM ASH-SHUWAILHY

KARM BASIL

KARMS STRUCTURES ROADS

CONTOURS DRAWN AT EVERY 5M HEIGHT INTERVAL EXCEPT OF THE LAKESHORE LINE 2 M ABOVE MSL 1906

MAP 1

PHILOXENITE

GENERAL PLAN

OF THE ARCHÆOLOGICAL SITE

SURVEYED BY

ANDRZEJ BRUNO KUTIAK 2018-2022

ASSISTED BY TOMASZ DERDA, ALEKSANDRA PAWLIKOWSKA-GWIAZDA,
ARKADIUSZ PANIC, JOSÉ CANO CORREA & MICHAŁ ŁUBA

THE PROJECT LED BY

TOMASZ DERDA

PROFESSOR AT THE UNIVERSITY OF WARSAW, FACULTY OF ARCHÆOLOGY
IN COLLABORATION WITH THE POLISH CENTRE OF MEDITERRANEAN ARCHÆOLOGY, UNIVERSITY OF WARSAW

THE PROJECT FINANCED BY THE POLISH NATIONAL SCIENCE CENTRE (GRANT 2017/25/B/HS3/01841)

PLANS OF THE BASILICA, EASTERN BATHS AND WESTERN BURIAL CHAPEL
TAKEN FROM THE SURVEY OF DARIA TARARA 2007-2018
PLANS OF THE STRUCTURES NORTH-EAST FROM THE BASILICA PARTLY FROM SURVEY BY JACEK KOŚCIUK 2011
THE ISLAND AND PROMONTORY PLANS TAKEN FROM D.A.O. SURVEY BY ISABELLE HAIRY AND VALÉRIE PICHOT 2008-2009
DOTTED LINES SIGNIFY STRUCTURES PARTLY REVEALED BY THE MAGNETIC SURVEY
2018 OF KRZYSZTOF MISIEWICZ AND WIESŁAW MAŁKOWSKI, ASSISTED BY TOMASZ GROSZEK
AND MAGNETIC SURVEY 2021-2022 BY TOMASZ HERBICH ASSISTED BY KONRAD JURKOWSKI
LAKESHORE AND THE LINE OF THE MODERN ROADS GIVEN AS APPROXIMATION
BASED ON THE SATELLITE IMAGE

COORDINATE SYSTEM: EPSG 32635
VERTICAL DATUM: MEAN SEA LEVEL ALEXANDRIA 1906

LEGEND:
CONTOUR LINES EVERY 0.5 M

MODERN ROADS AND STRUCTURES — ANCIENT STRUCTURES — APPROXIMATION OF STRUCTURES — LINES BASED ON THE MAGNETIC SURVEY OR/AND TOPOGRAPHY

SCALE 1:3000

0 10 50 100 200 m

N

LAKE MARYUT

ACCOMPLISHED 29TH SEPTEMBER 2023

TO ABU MINA

MAP 2