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Egyptian Houses in Their Urban and Environmental Contexts

Some Case Studies of the Roman and Late Roman Periods

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Excavations in urban and domestic areas of all periods have increased in recent years in Egypt and are helping to define characters, traditions, habits, and innovations for the different parts of the country. It is well established that we cannot give a single definition or description of Egyptian domestic architecture because it varies according to periods, geographical locations, and social status of the owners. Building technique and materials, on the contrary, are quite uniform across time and space, but still possess regional peculiarities, often determined by the climate and, in general, by the environment and available materials. Urban layouts of villages, towns and cities are also clearly influenced by local geomorphology and climate. This influence is particularly evident in marginal areas, like the oases and the outskirts of the Fayum.¹ Studies of urban layout and domestic architecture in ancient settlements have too often been pursued in isolation, without an integrated analysis of the geographical, geomorphological, and environmental contexts. Here, I present a first attempt to focus the attention on the environmental contexts and constraints in which houses and settlements were built, and aim to add a new perspective to social and cultural interpretative theories on domestic architecture.² This environmental perspective helps to clarify the origins of some peculiar features of the spatial organization of local communities.³ Some characteristics are far from being of Greek or Roman origin: it has been noted that houses in settlements located on the outskirts of cultivated land and close to the desert, such as those in the Fayum and in the oases of the western desert of Egypt, cannot be defined as either Greek or Roman in their structure and are far from having characteristics common to Mediterranean houses with central open-air courtyards. Instead, they constitute relatively small, closed systems and are often inserted into a dense and labyrinthine layout of streets, partly shaded and closed by doors.

Settlements in Arid and Sandy Environments: General Characteristics

Considering the Greco-Roman and Late Roman settlements in arid environments in Egypt, it is immediately evident that the main characteristics of Hellenistic and Roman architecture and urban planning, as they are well established in other regions, are not present, at least in the settlements we know best. One of the main characters of Roman urban plans⁴—the close connection between the public buildings, the public squares, and the space outside the urban perimeter—is not present in extant Egyptian settlements, but it must be noted that none of them are *nome* capitals or *metropoleis*.⁵

Settlements on the Outskirts of the Fayum

A relevant and monumental feature in the Roman-period Fayum settlements is the main temple with an associated *dromos*, or processional road, which played important religious and social functions. The dromos cannot be considered, however, as a connecting road within the settlement: in some cases, like Tebtynis, the dromos was used as a market area, and therefore as an agora, but in others, like Soknopaiou Nesos (figure 1.1) and Narmouthis, it seems to have been used only to perform rituals.⁶

A compacted and labyrinthine layout, with narrow streets and few open spaces, seems to characterize most of the settlements in arid environments in Egypt. In the Fayum the best-preserved settlements were, and in a few cases still are,⁷ located on its fringe. Here the anthropization stopped after the settlements' abandonment, which occurred between the third and the seventh centuries CE, and the desert sand covered the ancient remains, protecting them until the end of the nineteenth century.⁸ The Fayum is usually described as the most Hellenized region of Egypt because of the presence of a high number of "Hellenes" as settlers and the impressive Greek documentation on papyri. From the beginning of the Ptolemaic Period, a series of new settlements was founded throughout Egypt, particularly in the less densely populated areas of the *chora* and the Fayum and in the new agricultural lands created by large-scale projects of land reclamation. We do not know much about the urban layout and house types of these new settlements of the Hellenistic Period, because they were enlarged and replaced by those of the Roman Period. The excavations of some multistratified sites (in Arabic *kiman*, artificial hills) demonstrated transformation over time in settlement dimension and number and density of buildings.⁹ Identification of different phases in settlements with only one occupation level preserved, like Dionysias, Euhemeria, Theadelphia and Philadelphia, is more difficult to determine and would need new careful, stratigraphic excavations, where still possible. Only in a few cases and in limited areas have archaeological excavations exposed sequences of occupational levels: for example, at Karanis, Soknopaiou Nesos, Bakchias, and Tebtynis.¹⁰ From these cases we can infer that the dimension of towns and the density of buildings started to increase at the end of the Ptolemaic Period and that a significant growth of the urbanized population in the Roman Period, reaching a peak in the first half of the second century CE, caused substantial change in urban layouts.¹¹ The Hellenistic phase of the oases settlements is still largely unknown and our analysis will be confined to the Roman and Late Roman Periods.



Figure 1.1. Plan of Dime/Soknopaiou Nesos. (Courtesy of Soknopaiou Nesos Project.)

Examining the urban layout of these villages and towns in their evolution, we see the basic “rule” of orthogonal organization holding constant for streets and houses, but it did not necessarily result in chessboard plans.¹² Often the streets are of irregular width, and in the Roman Period the narrowest alleys leading into blocks of houses were often partitioned and became courtyards, serving single families with kitchen facilities and and/or pens for animals. The use of what we tend to consider public spaces, like the streets, still requires more analysis in the Egyptian context.¹³ Especially in the Roman Period, when houses were built abutting each other on rows separated by narrow alleys, people often modified alleys for private use by constructing transversal walls that enclosed spaces to form courtyards, sometimes equipped with doors or narrow passages to let people pass from one area to the other.¹⁴ Moreover, streets and alleys were closed with walls and/or doors. Examples include the east and west sectors of the University of Michigan excavations at Soknopaiou Nesos, Karanis, and the houses east of the temple at Tebtynis.¹⁵ The use of walls and doors to close all or part of the alleys may suggest a need to protect houses and courtyards from intruders, but it may also be considered as a protection against wind and sand accumulation. In Soknopaiou Nesos, the west excavation sector consists of one block of houses built on the outskirts of the settlement: the west side of the block is a continuous wall composed of a row of houses, forming a sort of barrier against the northwesterly winds. The two east-west oriented streets (I 100 and I 115), bordering the block of houses, were closed by walls on their west end, probably as a protection from wind and sand (figure 1.2). Fences made with stones were built, probably in the

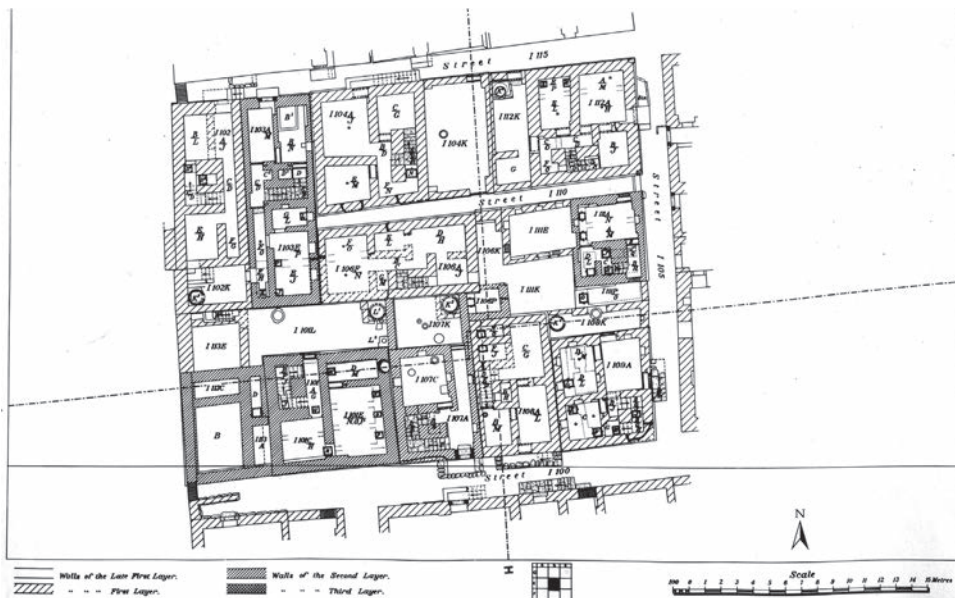


Figure 1.2. Dime. Plan of sector west First Level, excavations of the University of Michigan 1931–32. (Boak 1935, Plan VII.)

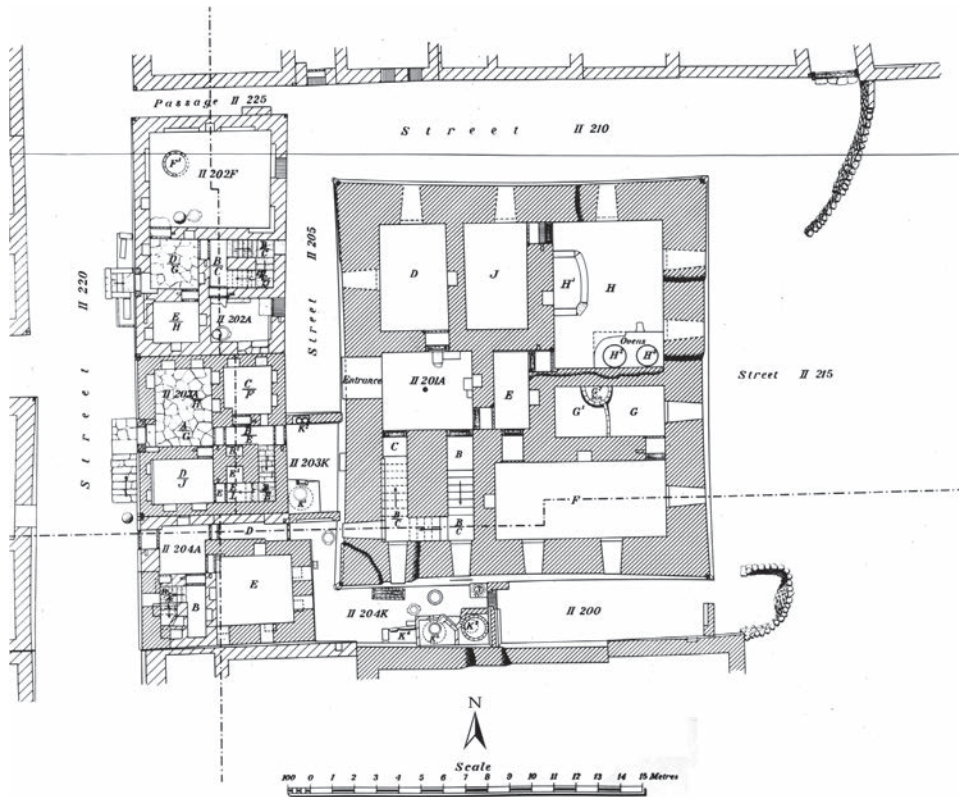


Figure 1.3. Dime. Plan of sector east Late First Level, excavations of the University of Michigan 1931–32. (Boak 1935, Plan III.)

first half of the third century, on the east side of the east excavation sector, to protect the entrance of the east-west running streets (II 200, II 210) (figure 1.3).¹⁶

At Karanis, windbreak walls also appear in streets and in front of building entrances, and walls with doorways close off alleys to create private courtyards or passages with animals' pens, ovens, or bins.¹⁷ A similar use is attested in Roman-period alleys in Tebtynis, where the partitions became courtyards, usually placed at the rear of houses and directly connected with them.¹⁸

These doors, walls, and barriers in and at the entrances of streets limited the free circulation of people, and some were presumably intended to prevent accumulation of windblown sand. The climate and environmental conditions in these settlements on the fringe of the Fayum were and are still characterized by wind throughout the year, and accumulation of windblown sand is clearly visible in their stratigraphy.¹⁹ Open spaces like courtyards and streets were exposed to strong sun, winds, and dust and needed simple and pragmatic protection strategies, such as maximally reducing open areas and building barriers. It would also be reasonable to consider some kind of roofing on kitchen facilities to avoid direct exposure to wind and sun. Unfortunately, the evidence of roofing in streets and courtyards is rarely documented in

archaeological excavations, because the traces of wooden beams high on walls are not always easily recognizable. In Soknopaiou Nesos, either the University of Michigan expedition did not document these traces, or likely, the perimeter walls of the excavated houses were not preserved to the height of any external roof. However, G. B. Belzoni described the houses and the roofing technique he saw in Dime during his visit in 1819 with a wealth of detail and noticed that the narrow lanes among the houses were also covered.²⁰

Settlements in the Western Desert Oases

The private use of streets and the closing of alleys with walls and doors are also common in Roman and Late Roman settlements in the Great Oasis (Dakhla and Kharga) of the western desert of Egypt, including Amheida/Trimithis, Ismant el-Kharab/Kellis, and Douch/Kysis. The presence of different kinds of street roofing has been clearly identified at Amheida in the fourth-century level. The site is under investigation by New York University: the team has documented the buildings visible on the surface and excavated four sectors of the third-fourth century polis, as well as the temple area (figure 1.4).²¹

In Area 2, the two streets east (S 2) and west (S 3) of the rich fourth-century house of the city councilor Serenos (figure 1.5) reveal peculiarities in road organization and use, including a combined use of doors and roofs to divide and protect parts of the open spaces. The conservation of this part of the city is remarkable because three meters of windblown sand covered the buildings soon after their abandonment toward the end of the fourth century CE.²² Similarly well-preserved settlements are Kellis, in the center of Dakhla Oasis, with quarters of the third and fourth century recently explored,²³ and Kysis in the south of Kharga Oasis.²⁴

The urban layout of these settlements cannot be considered as a purely Roman conception: they lack a “city center,” thoroughfares, and public buildings clearly connected to each other.²⁵ None of them were equipped with monumental public buildings, with the exception of the temples;²⁶ their planning and architecture cannot be compared with higher-ranking cities either in Roman and Late Antique Egypt or in the Roman provinces more generally, a possible sign of the absence of imperial interventions on the urban setting.²⁷

The excavation of Serenos’s house and part of its neighborhood at Amheida may help us interpret other, still-unexcavated areas of the city, as well as the overall street layout. The buildings bordering Streets 2 and 3 in Area 2 are preserved, like Serenos’s house, up to 2.5–3 meters in height; the compacted mud floors in the streets are also well preserved and were excavated according to the stratigraphic method (figure 1.5).²⁸ Accordingly, we can distinguish several floors and features built and dismantled in different phases and connected to the house’s activities. Both streets look like private passages, closed at the south end by walls, and with gates that seem to separate the “properties” and regulate the passage or offer protection.²⁹ Moreover, Street 2 (6 meters wide, excavated for 17 meters in length), was at a certain point used for private purposes: a *stibadium*, or reclining sigma-shaped seat used for banqueting, was built on the east side of Serenos’s house, and the street was closed

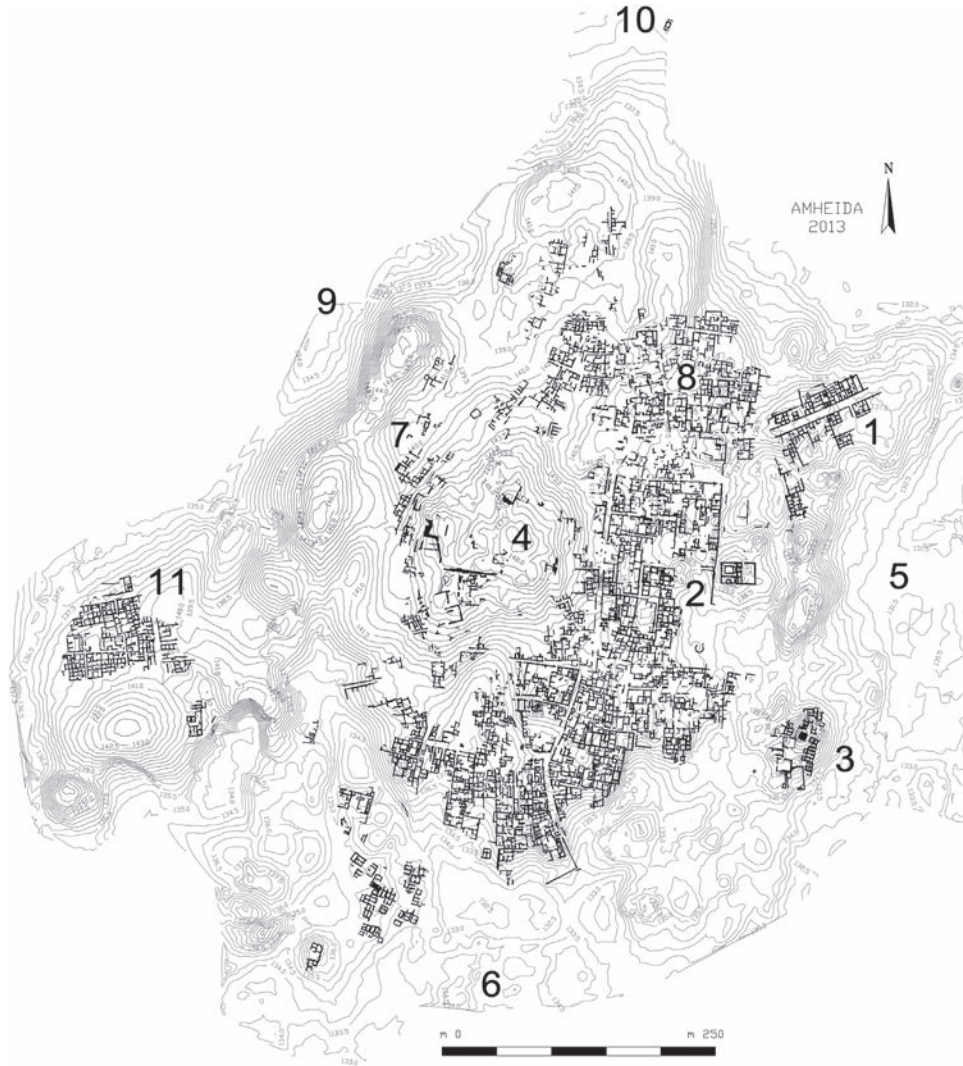


Figure 1.4. Plan of Amheida/Trimithis (Dakhla Oasis) with areas' numbers. (Courtesy of NYU Excavations at Amheida.)

with two doors defining the space “belonging” to the house (figure 1.5). The area with the stibadium was also covered with a flat, light roof supported by two pilasters in the front and by a thin wall on the east. The stibadium seems to have been short-lived: it was demolished down to its first two courses and covered by a new mud floor. However, Street 2 did not return to being a public and open passage, because the small door to its south edge was bricked up.³⁰

Street 3 (from 1.8 to 2.40 meters wide, excavated for 25 meters in length) runs north-south in front of the west and main entrance of Serenos’s house (figure 1.5). The excavation revealed that the alley was partitioned in two sectors by a door that



Figure 1.5. Plan of Serenos's house (B1) with streets (S2 and S3) and annexed building to the north. (Courtesy of NYU Excavations at Amheida.)

defined the spaces pertaining to two houses (B1 and B8). The alley was shaded by a flat roof between the doors of the two houses, and by a two-meter-long mud-brick barrel vault at its south end. The space above the entrances to the houses was left uncovered to give light to them.

Kitchen or storage facilities or animal pens did not appear in these two streets. The street surface was fairly clean and the waste from Serenos's house was deposited

in a short dead-end alley northeast of the building.³¹ Evidence for the partial roofing of these two alleys includes collapsed wooden beams in S2 and still-preserved recesses for beams in the side walls in S3, as well as a posthole for a vertical support for the flat roof in S3. However, the most striking roof in alley S3 was the barrel vault at its southern end, still partly preserved. We can only speculate about its function, because the street surface underneath was perfectly clean and provided no evidence for the use of the space, and the side houses are not yet excavated. The vault seems to have supported a room or passage connecting the two side buildings, and at the same time, it offered a shaded space in the alley.

The fourth-century street layout at Trimithis appears today as a labyrinth formed by narrow alleys that often disappear in the wall network (figure 1.4). This mazelike effect probably derives not only from the irregularity of the street system, but also to the inclusion of partly covered alleys among the visible features. These can be misinterpreted as corridors or internal passages because they are covered by vaults and flat roofs or partitioned by walls and doors.³² Linking buildings above the roads and supported by vaults, as with S3, are other possible elements of fourth-century domestic architecture. Described in a recent publication, a barrel vault covering a passageway was also found at Ain el-Gedida, a fourth-century rural village near Kellis.³³ Archaeologists in this *epoikion* found a church and a pagan temple among several buildings that constitute a network of rooms connected by narrow passages and clustered in blocks separated by main orthogonal streets.

The street network in the last phase of Trimithis's life has marked characteristics of a closed system, difficult to cross and well protected from winds and sun. The heavy doors that blocked the streets, like the one found in Street 2 (1.6 meters wide and closed by one wooden leaf), may also have been intended as protection from intruders. Streets closed by doors also appear elsewhere in the Late Roman settlements of the oasis. At Kysis, Reddé excavated part of the settlement that featured an irregular layout and narrow streets. Doors and other passageway-blocking features appeared in the explored streets, but the published report does not mention any possible roof. At Kellis, doors closing streets are also common in the compact blocks of densely built buildings; however, no analysis of the street network or the use of "public" spaces has yet been accomplished.³⁴

In summary, common characteristics of the Roman and Late Roman settlements in arid environments include a high density of buildings; labyrinthine street layout; narrow alleys closed by doors and in some cases also roofed; and windbreak walls. Settlements of this type must have appeared as extremely compact and closed urban clusters. Even more compact clusters are the fortified settlements of the third to fourth centuries in Kharga. According to Rossi and Ikram, the internal street layout of the Umm el-Dabadib fort consists of narrow alleys covered by vaults in a way very similar to local medieval settlements.³⁵ The same scholars also recognized other possible alleys and streets protected by vaulted ceilings in Umm al-Qusur.³⁶

As already noted, these same practices are present in Byzantine and medieval settlements in the same regions, such as El-Qasr and Balat in Dakhla Oasis, but also in Kharga.³⁷ Namely, the origin of features like mud-brick architecture; compact organization of built space; high density of buildings; labyrinthine layout with a

hierarchy of streets that are mostly narrow, shaded or semi-shaded, and often closed with doors; and a tendency to close spaces to avoid the exposure to sun and winds can thus be traced back to Late Roman and Byzantine urbanism of the Middle East and North Africa, and these features are most probably the result of climatic and security constraints.

Houses in Arid and Sandy Environments

The environmental conditions in the oases and at the fringe of the Fayum in the Roman Period seem to have deeply influenced the urban setting, conferring to the settlements some characteristics that would be further developed, also for social and cultural reasons connected to religious behaviors, in local medieval settlements. In these dry, windy, and sandy environments, built spaces were organized to avoid exposure to the elements as much as possible. Consistently, people built houses as closed systems, taking advantage of local materials and of a deep-rooted building tradition.

Houses in the Fayum Settlements

Built in mud brick, local stone, or stone and mud brick, the houses in the Greco-Roman-period Fayum are rather uniform in their architectural features.³⁸ Each building differs from the others in several details and disposition of rooms, and typological classification can become very elaborate, depending on what criteria we employ.³⁹ This study does not aim to create such a typology, but rather to point out some characteristics of domestic architecture that were, in my opinion, deeply influenced by local environment and climate. These characteristics are clearly identifiable where entire blocks of houses and streets were brought to light and where the buildings are preserved at least to the roof of the first floor, as at Karanis, Bakchias, Soknopaiou Nesos, and Tebtynis.

Domestic buildings dated to the Hellenistic and Roman Period have square or rectangular plans, are free standing, and have more than one story, with a staircase generally inside the building. The external shape is that of towers: either built in isolation and surrounded by streets or a courtyard, as is the case for Hellenistic-period houses, or abutting each other to form blocks of houses in the Roman Period. Scholars have debated the origin of this tall building type, its Egyptian or Greek cultural background, and its potential identification with the *pyrgoi* mentioned in papyri.⁴⁰

The University of Michigan excavations at Karanis (1924–34) and at Soknopaiou Nesos (1931–32) discovered several houses, in an excellent state of preservation, in the shape of towers, tapering toward the top, with small windows and with a terrace on the roof (figure 1.6).⁴¹ More recently (1988 to present), the Italian-French Mission at Tebtynis found the same kind of domestic buildings. This type of house was very massive, tapering, and above all, closed; the only open spaces were the annexed external courtyards, as we have seen above, and the terrace on the roof.⁴² The interior would have been quite dark, fresh in summer and rather warm in winter. Common features in these houses are the deep foundations (also known as *fondations à*



Figure 1.6. Dime. Sector east, excavations of the University of Michigan 1931–32, the tower house and adjacent buildings in 2018. (Courtesy of Soknopaiou Nesos Project.)

caissons); underground vaulted cellars (to avoid open-air storage); and narrow windows, closed with vertical or horizontal wooden bars, and located directly beneath the ceilings, with sharp, long sills sloping toward the interior. These windows served only for light and air and not as viewpoints.⁴³ A narrow horizontal opening above the main entrance door was documented for some Karanis houses, suggesting that the door was intended to be closed most of the time and that the entrance room got light and air from this small opening.⁴⁴ The walls were mud plastered, and in some rooms at Karanis they were also painted black. The roofs of the aboveground rooms are usually flat in these Fayum houses.

Another, more complex, kind of house is also present in the Fayum settlements.⁴⁵ Generally, it did not have deep foundations or underground cellars and was not multistory, even if the presence of a staircase implies at least a terrace on the roof or one upper floor. The appearance of these houses was different from the tower-like houses, with a broader extension at the ground floor. This kind of building has been found in Dionysias, Narmouthis, and Theadelphia, and its rich decorative apparatus of non-Egyptian style suggested to the excavators public or semipublic functions rather than domestic. The main room is generally painted and provided with several niches; it is open on the front side, where two pillars mark a tripartite entrance closed by wooden leaves. The peculiar shape and decoration of these kinds

of rooms are well-established markers of a banquet hall in Roman and Late Roman domestic architecture. This room type became popular and widespread in Egypt in particular during the fourth century CE, in houses of mid- to high-status families.⁴⁶ In these houses, too, windows must have been located high on walls.⁴⁷ In a few cases the central room, which served as a sort of hub connecting the other rooms and the staircase, has been interpreted as an internal open-air courtyard: for instance, in buildings in Medinet Ghoran and Theadelphia, both settlements on the west fringe of the Fayum.⁴⁸ Previous debates have discussed whether the internal courtyard was derived from Greek or Egyptian domestic architecture, and it is beyond question that different architectural models or different personal adaptations may have influenced house designs.⁴⁹ However, at least in the cases mentioned above, there is insufficient archaeological evidence to conclude that these rooms were open air. The presence of internal courtyards would strongly contrast with the general characteristics of these houses and settlements, generally conceived and organized, as we have seen, to protect the inhabitants from strong sunlight and winds.

Houses in the Oases

The houses in the western desert oases of the Roman and Late Roman Periods do not have a towerlike shape and are not self-standing. Typically, they share their perimeter walls with adjacent houses and have shallow foundations. These building techniques, already well known in Pharaonic-period settlements, saved materials, space, and labor, but limited the load-bearing capacity of the walls. These buildings had one or two stories and no underground rooms or cellars. Rooms could be covered with barrel vaults, rarely with domes, and with flat roofs made of palm beams and mats of palm ribs.⁵⁰ In Serenos's house, windows were not preserved, but based on the domestic architecture of Kellis and Kharga Oasis, we can infer that they were narrow vertical openings just below the vault and without sloping sills.⁵¹ The house was built on a square plan (15 x 15 meters), and in a later phase it was expanded northward to incorporate parts of another building, formerly a Greek-language schoolhouse.⁵² The building was accessed by three entrances from Streets 2 and 3;⁵³ the central Room 2 functioned as a hub for the house and was also the antechamber to Room 1, a squared, domed space richly decorated with wall paintings in classical style and with Greek and Roman subjects.⁵⁴ This space was certainly used as a reception room and a banquet hall, and it was designed to amaze guests with its particularly complex and colorful decoration, in which geometric panels and figurative registers covered the side walls and a circular, concentric geometric freeze delimited a psychedelic feather motif on the dome. This colorful room occupies a central position in the house and lacks windows; light may have come from Rooms 2, 11 and 14 when their doors were opened, or from an oculus in the dome, for which, however, we do not have any evidence. Room 2 was also placed in the middle of the house, and it got light and air from vertical openings in the flat roof. This air and light system was observed for the first time in this room, thanks to the good vertical preservation of the side walls. The roof of the room was certainly flat, even though its collapsed remains were not found in the fill. Four vertical recesses,



Figure 1.7. Serenos's house Room 2. Detail of the recesses above the doors leading to R6 and R7. (Courtesy of NYU Excavations at Amheida.)

similar to shallow niches, are located above the lintels of the doors entering into R4, R6, and R7, and above the niche on the west wall of R2 (figures 1.5 and 1.7). These vertical shafts reached the flat roof and gave light and air to the room. They were built in the walls according to the length of the underlying doors (95 centimeters) or niche (75 centimeters), with depths respectively of 20 and 10 centimeters.

Even though no material remains of a roof have been found in R2, these vertical openings provide secure evidence that a roof was present. This example should warn archaeologists against automatically interpreting central rooms as open-air courtyards, at least in domestic contexts in arid environments.⁵⁵ Furthermore, the presence of ovens and fireplaces in rooms is not necessarily evidence for the lack of a roof, because there may have been vertical openings in the roof itself. Well-preserved evidence for this arrangement comes from Room 4 of Serenos's house, in which a fireplace was built in front of the doorway during the last phase of occupation. Room 4 was barrel vaulted and the walls were blackened by the smoke of the fireplace, whose position in front of the doorway was deliberately chosen because of the presence on top of the door of a vertical shaft in the flat roof of the connected R2. Hearths were also found in Kellis houses, in some cases also in the central rooms, here interpreted as covered rooms.⁵⁶

Open spaces were clearly present in some houses of the Hellenistic and Roman Periods in Egypt, as is demonstrated by the Classical-style houses in Alexandria, Marina el-Alamein, and also Tebtynis, so it is not impossible that people may have reproduced such a feature in other geographic and climatic contexts.⁵⁷ In the oasis settlements and on the fringe of the Fayum, however, the widespread adoption of urban and architectural patterns suited to minimizing the environmental hazards of arid and sandy contexts (such as strong winds, sand accumulation, alternating low and high temperatures during the night and day, and strong sunshine) suggests that internal open rooms in domestic architecture would be incoherent. *Aithrion*, usually translated as internal courtyard, is a Greek term attested in papyri of the Roman and Byzantine Periods for a space in Egyptian houses. However, Daniel has demonstrated that in Egyptian contexts such rooms were not open air, but rather central, covered rooms provided with a ventilation system, like the vertical windows found in Room 2 of Serenos's house.⁵⁸ Thanks to the good preservation of the building, this room provides unique archaeological evidence in Egypt for the existence of a ventilation system in a central room that served as a hub for the internal circulation of people.

Serenos's house was reproduced in 1:1 scale at the entrance to the site of Amheida to serve as a local tourist information center (figure 1.8). The reconstruction was designed to allow visitors to enter the house and admire the extraordinary paintings that were also reproduced. N. Warner and D. Schulz respectively built and painted the replica with great skill and precision, according to the archaeological remains.⁵⁹



Figure 1.8. Serenos's house replica built at the entrance of the archaeological area. (Courtesy of NYU Excavations at Amheida.)



Figure 1.9. Serenos's house Room 2 replica, with the vertical window above the west niche. (Courtesy of NYU Excavations at Amheida.)

Some interpretations were necessary to fill gaps in the evidence, like the oculus in R1 and narrow windows in the side rooms. This reconstruction gave us the opportunity to quantify materials and labor time, to study building and painting techniques, and to come to a good, realistic understanding of the living space. The reproduction of the house in the same environment as the original (but in isolation) has proved invaluable for our understanding of the interior living environment in the changing weather: the few and narrow windows reproduced in the various rooms according to comparanda elsewhere in the oases, as well as the vertical window in the central Room 2, were more than enough to illuminate and ventilate the whole building while also avoiding the intrusion of sand during sandstorms (figures 1.9 and 1.10).

Adapting to Local Environments

The settlements built in the western desert oases and on the Fayum's fringe had to deal with a sandy desert environment that, as in the medieval period, discouraged the creation of any wide openings, like wide streets and squares. For the same reason, houses were structured to prevent wind, dust, and sun entering abruptly. Reddé has identified certain features of these settlements' layout—the use of doors to close streets, which are often narrow alleys forming a labyrinthine network of passages, sometimes roofed—as typical characteristics of Near Eastern tradition, which was not only Egyptian, and which characterized the oases settlements until premodern



Figure 1.10. Serenos's house Room 1 replica. (Courtesy of NYU Excavations at Amheida.)

times.⁶⁰ These settlements appeared compacted and closed, difficult to cross, and well protected.

Greek textual evidence from Egypt, and specifically the vocabulary used to describe houses and their parts, has suggested to several scholars that the domestic architecture of Greco-Roman Egypt was similar to that in other Mediterranean countries. Some Greek and Roman house types certainly were imported and may have been common in Alexandria, Lower Egypt, and most probably the *metropoleis*. However, practical considerations ensured that these house types, with a peristyle or a central open-air courtyard, were certainly not common all over the country—especially in arid contexts, where domestic architecture was designed to drastically separate interior family life from the outside world, in contrast to Greek practice in other parts of the Mediterranean.⁶¹ The adaptation of architecture, especially domestic architecture, to different environments and locally available construction materials is an obvious principle already stressed by Vitruvius (*De Architectura*, VI, 1, 1). Recent discoveries in the western desert of Egypt allow a better understanding of Vitruvius's statements and add an important chapter to the study of ancient domestic architecture. The good state of preservation of several houses allows us to appreciate and evaluate domestic architecture not only on the basis of ground plans preserved at foundation level (as is the case at many archaeological sites), but through standing architecture, which allows us to study the house as a three-dimensional space and to identify the roofing typology and the presence/absence of windows and openings.

Houses are certainly expressions of cultural and social identity,⁶² but at the same time, people had to take into consideration practical issues and adapt to local environments.

Notes

- 1 On our partial knowledge of Egyptian urbanism, see Davoli 2011.
- 2 Subías 2011. See Nevett 2015; Huebner 2017 on the complex interactions of cultural, social, environmental, and personal needs within domestic buildings. On the social interpretation of Karanis's layout, see Simpson (chapter 2, this volume).
- 3 I would like to thank N. Aravecchia for having corrected my English and for the helpful discussions about Ain el-Gedida architecture.
- 4 MacDonald 1986, 30.
- 5 This analysis will exclude Antinoopolis and Oxyrhynchos, which were located in arid environments: the first because of its Roman foundation according to non-Egyptian traditions, the second because its present condition does not allow a precise evaluation of its layout and kind of domestic architecture. For an overview of Roman monumental settings in the nome capitals see Bowman 2000; Bailey 1990, 2012.
- 6 On the dromos as a monumental road for processions (*pompé*) in Egypt and in the Hellenistic world, cf. Cavalier and Des Courtils 2008, 90; Davoli 2011, 80–81; and Davoli 2018.
- 7 These settlements were affected by the activities of the *sebbakhin* in the last two centuries and what is left is at present threatened by continuous expansion of cultivation and villages.
- 8 Davoli 1998 and 2012.
- 9 The multistratified sites are those that were originally surrounded by the desert and thus subject to accumulation of sand, which was one of the causes of their growing levels. On multilevel and monolevel settlements in the Fayum see Davoli 2011, 72. The expansion of the settlement from the beginning of the Roman Period is related to the population increase, probably due to good climate conditions (good Nile floods) and to an efficient management of the water within the region. On climate change in the Roman Empire: McCormick et al. 2012, 169–220.
- 10 See respectively: Husselman 1979; Boak 1935; Davoli 2005, 218–19; Hadji-Minaglou 2007.
- 11 For plan comparisons see Davoli 2011. For population estimates see Mueller 2011.
- 12 Davoli 2011. Dionysias and Philadelphia had quite regular grids of streets and house blocks.
- 13 Marouard 2008; Kaiser 2011, 45; for the hierarchy and terminology of streets, cf. Du Bouchet 2008.
- 14 This phenomenon appears in the stratigraphic sequence of buildings east of Tebtynis temple: Hadji-Minaglou 2007, figs. 81–83.
- 15 See respectively: Boak 1935, Pls. III–VII; Husselman 1979, 29–31; Hadji-Minaglou 2007, figs. 81–83. On Karanis see Simpson, chapter 2, this volume.
- 16 Some other cases in Marouard 2008, 123.
- 17 Karanis Level C, Husselman 1979, 29–31. No roofs have been noted in Karanis streets, in which presses for oil were also found, together with kitchen facilities and several animal pens; roofs and doors protected the latter. On Karanis, see Simpson, chapter 2, this volume.
- 18 Tebtynis east of the temple area: Hadji-Minaglou 2007, 197–98. There is no mention of possible roofs in streets or courtyards.
- 19 Layers of desert sand separate the various levels of buildings: Boak 1935, Pls. XIII–XIV.
- 20 We cannot say to which level/period the houses and streets excavated by Belzoni belonged to, but most probably they were on the top of the *kom*. Belzoni 1820, 385–86.
- 21 For an overview, cf. Bagnall et al. 2015; for yearly reports www.Amheida.org. For a detailed analysis of the urban layout, street network, and the environment, cf. Davoli 2019; Bravard et al. 2016; Bagnall and Davoli 2020.
- 22 The settlement was built on cemented dunes and is covered by sand dunes that move southward from the north escarpment at a speed of ca. 7 meters per year: Davoli 2019; Bagnall et al. 2015, 11.
- 23 Hope 2015.
- 24 Reddé 2004.

- 25 According to MacDonald (1986, 3), “To be truly Roman, towns had to have at least the rudiment of armatures; those of large cities were highly elaborated.”
- 26 On the monumentalization of Late Roman cities and its ceremonial function, see Dey 2015, 65–77, 91–92 and 126, on the case of fourth-fifth century Ephesus. On monumental armatures, Roman architecture, and colonnaded streets in Egypt, see McKenzie 2007, 151–72; Ballet 2008; Bailey 1990; Pensabene 1993.
- 27 Jacobs 2012. Private euergetism and city councilors’ intervention in the cityscape is almost non-existent in the fourth century: Dey 2015, 93.
- 28 Davoli 2022.
- 29 The two doors found in S2 and S3 are in phase with the first floor in the streets. They may have been built immediately after the completion of Serenos’s house (around 340 CE).
- 30 Reddé considered the presence of doors closing the roads to be a local oasean feature that continued in subsequent medieval settlements. A small and rough structure built in Kysis’s “voie est-ouest 2” can probably be interpreted as a stibadium: Reddé 2004, 16–17, 21–22, fig. 20. The phenomenon of smaller structures encroaching on or usurping public spaces was very common in the late antique Roman empire: cf. Jacobs 2009.
- 31 Among the waste, several ostraka belonging to Serenos’s circle of people were found. This occurrence suggested the provenance of the waste from the house of Serenos.
- 32 Doorjambs are clearly recognizable in several streets and alleys.
- 33 Aravecchia 2018, B11 151–56; Bagnall et al. 2015, 157–68.
- 34 Hope 2015.
- 35 Rossi and Ikram 2006, 286, 465.
- 36 Rossi and Ikram 2018, 123.
- 37 Dabaieh 2011, 61–67, 160–65; Balbo 2006. A similar layout appears at Kafr Samir, a Byzantine village in Israel: Yeivin and Finkelsztejn 2008, 186–87.
- 38 On the basic typology, cf. Davoli 2015.
- 39 I will take into consideration those houses for which we have good documentation and a date derived from stratigraphic analysis. For a detailed study of domestic architecture in Greco-Roman Egypt, see Depraetere 2004–05. The author, however, did not discuss the reliability of the dating given by the excavators of single houses or sites. His study concerns mainly the plans of the buildings and the internal disposition of spaces and their connection. It must be noted, however, that internal connections between rooms in a house often changed over time, according to changing needs (see i.e. Davoli 1996, fig. 49; Bagnall et al. 2015, 89–90). Clear evidence comes from the stratigraphy of the walls, in which opening or bricking up of doors is widespread, as well as the building of partitioning walls. It follows that a classification of houses based on internal communication and/or numbers of rooms must be retained with caution. See also Correias-Amador 2013, 74.
- 40 Representations and remains of New Kingdom urban houses testify to the presence, in Thebes and Amarna, of a similar self-standing and multistory house type. However, the diffusion of this model into rural settlements with urban layouts started probably in the Hellenistic Period. On this topic cf. De Garis Davies 1929; Grimal 1939; Novicka 1975; Marchi 2014; Davoli 2015. Tower houses are well described by Marouard (chapter 3, this volume).
- 41 Husselman 1979; Boak 1935.
- 42 Some of these tall houses were bigger than average, and certainly had more stories: several examples are in Marchi 2014.
- 43 There were no large openings to let people look outside the house, meaning that this kind of architecture completely avoided the dialectic between interior family life and exterior life and landscape. By contrast, in Roman-period Syria, large houses in several cities had wide windows allowing some form of sight into the landscape. Internal courtyards, peristyles, and fountains are common features in these Syrian houses: De Giorgi 2015.
- 44 Husselman 1979, Pl. 43a.
- 45 Type 3 in Davoli 2015, 179.
- 46 Alfarano 2018; Davoli 2015, 181.
- 47 For a brief description of the windows in houses at Narmouthis, see Bresciani et al. 2006, 234.
- 48 Davoli 1998, 218; Rubensohn 1905; Nowicka 1969, 118–23.
- 49 Nowicka 1969, 119–23; Hope 2015, 225.

- 50 A very representative example of a flat roof was found collapsed in Room 7 in House B/3/1 at Kellis: Hope 2015, 210 fig. 9.
- 51 In Serenos's house, two windows of this kind (48–50 centimeters high and 17 centimeters wide) are actually still preserved in two walls added in a late phase to close a passage leading to the annexed Room 15.
- 52 On this school see Cribiore, Davoli, and Ratzan 2008; Cribiore and Davoli 2013.
- 53 In a second phase, one of the three doors was bricked up.
- 54 McFadden 2014.
- 55 In Amheida another house (B2) was completely excavated and the results published (Boozer 2015b). It is located in Area 1 and is preserved for about 50 centimeters in height. The erosion on the north area of the site is very harsh and the buildings are very badly preserved. Walls and their collapses are severely eroded, and the sand cover is very shallow. For this reason, some rooms in B2 contained no traces of collapsed walls and roofs. However, the excavator interpreted the absence of this evidence to testify to the absence of roofs in two rooms (7 and 5) of the house. Personally, I do not think this interpretation is feasible; certainly, it is not proved by the available evidence. The presence of a bread oven and a brazier in these rooms is not enough to assert the absence of a roof. On the contrary, the presence of a brazier (Room 5) testifies to the necessity to heat up the room, which thus was covered. The hypothesis that Room 5 was open air forced Boozer to an unrealistic reconstruction of the flights of the staircase and of its ending on the terraced roof (Boozer 2015b, fig. 6.4).
- 56 For a synthesis on houses at Kellis and a discussion of the presence of internal courtyards, see Hope 2015, 225–26, who thinks that the presence of a courtyard within the house is not proved by the evidence. On the same topic see Boozer 2015a, 190–92, who thinks the central rooms are to be considered open courtyards. In his analysis of Kellis architecture, Hope stresses the importance of sociocultural and environmental factors in individuals' choice of house type: Hope 2015, 226. On the doubtful interpretation of internal courtyards in ancient mud-brick architecture: Correias-Amador 2013, 78.
- 57 A peristyle house was found at Tebtynis: Hadji-Minaglou 2008, 125, 132 fig. 4. Another late Roman building with a peristyle was found in Kysis, but Reddé suggests it may have been covered with a flat roof (2004, 74). Peristyle houses are more common in settlements near Alexandria, such as Marina el-Alamein: Daszewski 1995; McKenzie 2007, 163–64. Greek papyri mention Hellenistic-type villas, such as the rich residential mansions of Diotimos, Apollonios, and Artemidoros at Philadelphia, known from Zenon's archive (255 BCE): see Davoli 2015, 181–82, with previous bibliography.
- 58 Daniel 2010, 128–47. A sort of wind-catcher was already used in Pharaonic architecture and still survives in the architecture of Islamic Egypt (*malqaf*): Spence 2004, 129. In the tower-shaped multistory houses of the Fayum, the rooms were located along the perimeter of the building and could access air and light from windows.
- 59 Warner 2012, 373–78; Schulz 2015.
- 60 Similar characteristics are documented for Syrian villages; see Reddé 2004, 17–18n22 and 23.
- 61 As Ault (2015, 127) explains: "Greek houses offered a sheltered, yet open arrangement for living ideally suited to Mediterranean settings, in which the outdoors was essentially brought indoors, harmoniously integrating exterior and interior spaces."
- 62 Nevett 2015, 143–49, with previous bibliography.

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