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Natalia Małecka-Drozd
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NOTES ON THE ORIGIN OF CASEMATE FOUNDATION PLATFORMS IN ANCIENT EGYPT

Abstract: *Casemate foundation platforms appeared in Egypt in the middle of the 2nd millennium BC during the 2nd Intermediate period. As they are similar in nature to palace-citadel structures from the capital of Egypt under the Hyksos, Avaris, the possibility of their being Asiatic in origin has been considered. Recently, however, similar structures from Deir el-Ballas have been associated with Nubian funerary architecture. Yet making a choice between these two hypotheses means forgetting about the achievements of Egyptian brick architecture. The link between casemate foundation platforms and high Nile floods, as well as their structural features, unquestionably suggest Egyptian origin. Over the course of this paper, I would like to consider if the appearance of casemate platforms in the 2nd Intermediate period and the beginning of the New Kingdom could be related to mastaba burials and the local development of foundation laying methods.*

Keywords: *Ancient Egypt; architecture; foundation platforms; Near Eastern influences*

Development of structures on casemate platforms

Mudbrick casemate platforms are one of the most characteristic features of Egyptian architecture of both the 1st millennium BC and the Roman period. Being an effective form of foundation, the platforms were used in residential buildings, temples and defensive fortifications. The earliest structures built using this technique appeared as early as the 2nd Intermediate period

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and they continued to be built from the New Kingdom onwards. After several years of research, their evolution process can now be revealed (Małecka-Drozd 2012, 69-80; Małecka-Drozd 2013, 77-83).

The first example of a building which can be considered to have been erected on a casemate platform is a palace from area F/II of Avaris in the eastern Nile Delta (Bietak and Forstner-Müller 2006; Bietak and Forstner-Müller 2009). The structure, which covers an area of approximately 18,000m^2, dates to the early Hyksos period (early 15th Dynasty) and is associated with King Khairan. The building is made up of several sectors arranged around a central tower (*Treppenhaus* 1) and its construction can be divided into two phases (Fig. 1). In the initial period of occupation

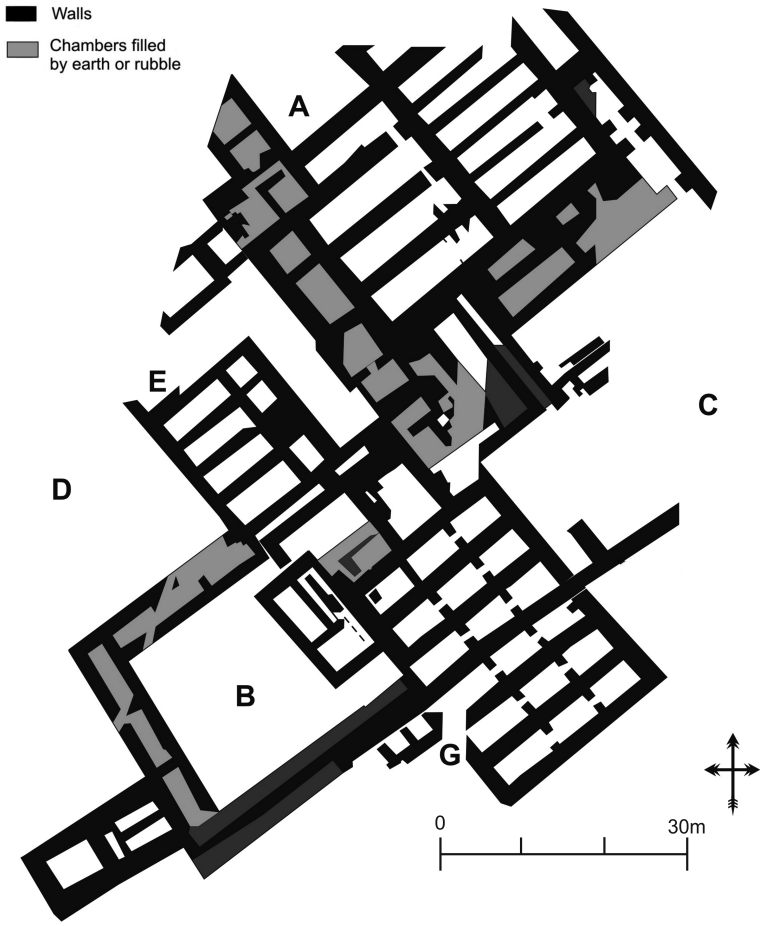

Fig. 1. The early Hyksos palace (15th Dynasty) from area F/II in Avaris. Redrawn and simplified from Bietak 2010, fig. 21

of the tower, the palace merely contained several utility rooms, a bathroom and a staircase to the upper floor, which was later filled in with earth. A complex of long, rectangular chambers (probably storerooms) (Fig. 1: part A) was located directly to the north of the tower. To its southwest and southeast was another set of rooms, which were also filled in with earth at some point. Chambers situated southwest of the storerooms would probably have constituted a ramp leading to the upper part of the building. Additional sets of long, narrow storerooms (Fig. 1: part G) constructed in a later phase (Fig. 1: part E) were located to the west and south of the central tower. A courtyard (Fig. 1: part B) surrounded by casemate walls was situated further south. According to its discoverers, this was the place where cult activities, Near Eastern in character, would have taken place. The southwestern end of the palace was marked by a casemate tower, known as '*Treppenhaus* 2'. Its eastern and western sides were demarcated by courtyards (Fig. 1: parts C and D). The overall structural arrangement of the palace is an example of the initial evolutionary phase of casemate platform architecture in Egypt.

Closely related to the early Hyksos palace is the North Palace discovered in Deir el-Ballas, Upper Egypt (Fig. 2; Smith 1958, 157-158; Lacovara 1981, 121; Lacovara 1990, 1-2; Lacovara 2006, 188-189). This structure, although similar in nature to the construction just discussed, is believed to represent the next stage in development of casemate buildings. The palace dates from the end of the 17th to the beginning of the 18th Dynasty. More axial in layout than its predecessor, it is characterised by its fairly large, central platform and possesses a set of long, narrow chambers surrounded by columned courtyards and rooms. As there are no clearly visible remains of a ramp leading up to the upper level, it was probably positioned perpendicular to the platform. In contrast to the 15th Dynasty palace, the North Palace had its long, inner casemate chambers intentionally filled in with earth and gravel, as there are no traces indicating that they were originally used as storerooms.

The next stage in the development of casemate palaces is demonstrated by a citadel from area H of Avaris (Palace C) dating to the late Hyksos period (Fig. 3: 1; Jánosi 1994, 28; Jánosi 1996, 97; Bietak *et al.* 2001, 32-34, 48-51), and the South Palace of Deir el-Ballas (Fig. 3: 2; Smith 1958, 158; Lacovara 1981, 121; Lacovara 1990, 5; Lacovara 2006, 189). Both buildings were solid structures completely erected on casemate foundation platforms. They were the first to adopt the most typical form of the style: a high, rectangular foundation with cells of diverse size and shape,

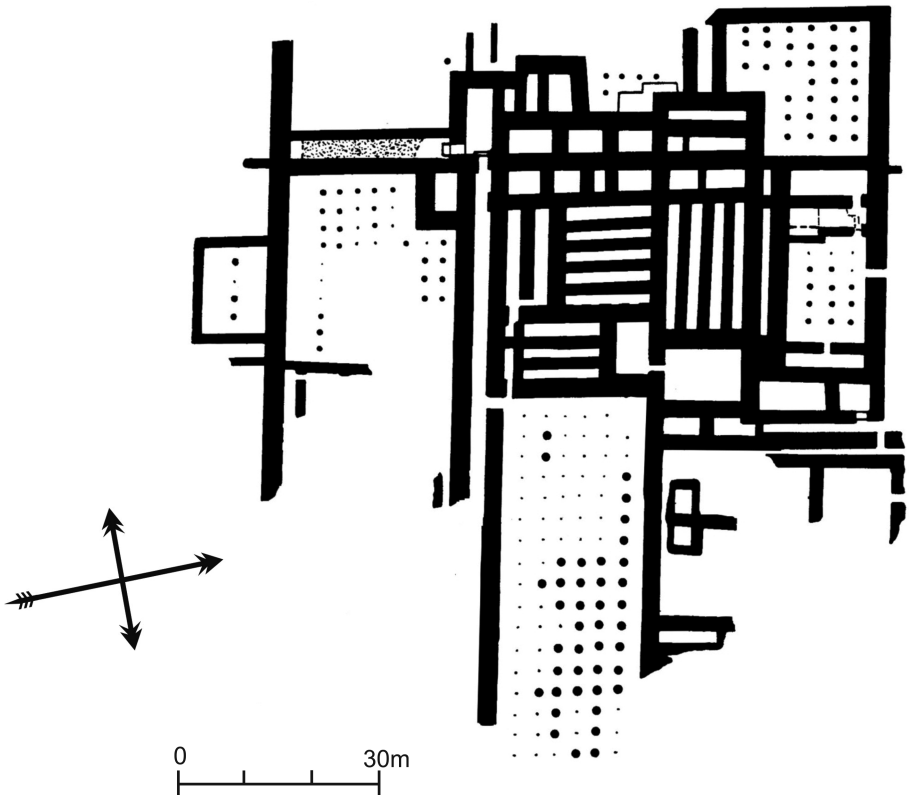

Fig. 2. The North Palace in Deir el-Ballas.
Redrawn and simplified from Lacovara 1997, fig. 5

the layout of which generally corresponded to the arrangement of the rooms on the upper level. The most characteristic feature of the South Palace was a single courtyard, which was situated in front of part of the platform on a lower level than the remaining rooms. The same feature can be assumed to have existed in the case of the Hyksos citadel. In both buildings, the chambers were filled in with earth to create a solid block foundation. Unfortunately, no traces of a ramp or staircase leading to the upper level has been found. Broad stairs were only discovered in the South Palace between a lower courtyard and the rooms arranged on the upper floor. The most important aspect of this stage in development is that the fully axial layout was first adopted at this time.

The last stage in the evolution of palaces erected on casemate platforms in the middle of the 2nd millennium BC can be witnessed in three structures from area H of Avaris. Palace F (Jánosi 1994, 30-31; Jánosi 1996, 96-98;

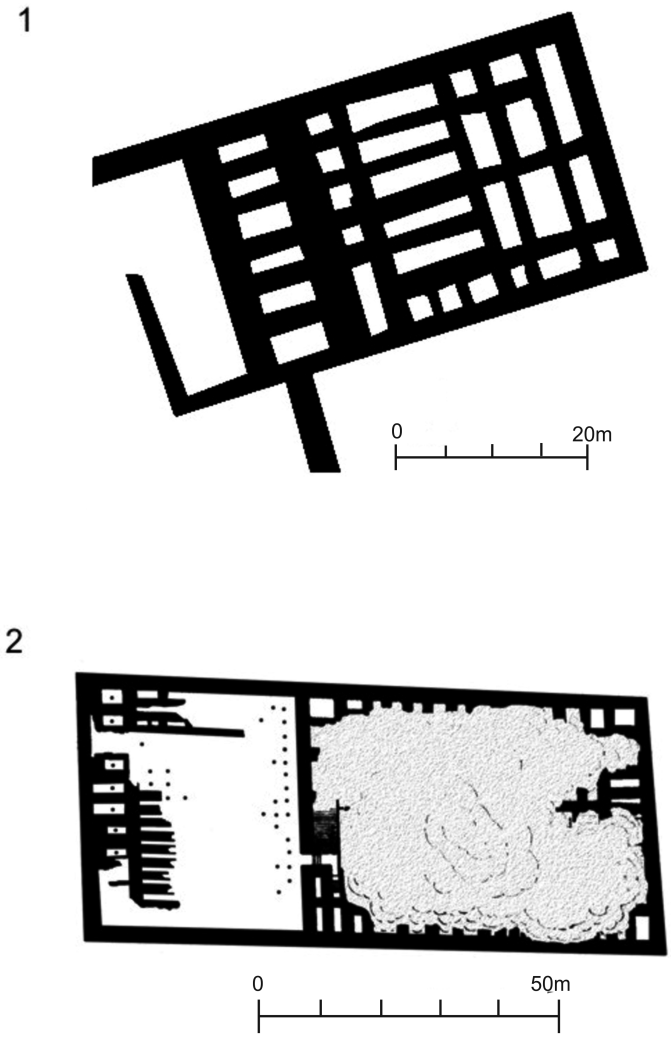

Fig. 3. 1 – The late Hyksos citadel from area H/III in Avaris.
Redrawn and simplified from Bietak 2010, fig. 25;
2 – The South Palace in Deir el-Ballas. Redrawn from Smith 1958, fig. 51

Bietak *et al.* 2001, 40; Bietak 2005, 15; Bietak and Forstner-Müller 2005, 73), Palace G (Bietak *et al.* 2001, 75-85; Bietak and Forstner-Müller 2003, 44-45; Bietak and Forstner-Müller 2005, 68-90) and Palace J (Bietak *et al.* 2001, 85) all formed part of the residential area of New Kingdom rulers from the early 18th Dynasty until the reign of Amenhotep II (Fig. 4). All of these structures possessed solid, rectangular casemate platforms with casemate ramps situated parallel to one of the shorter sides. The inner chambers

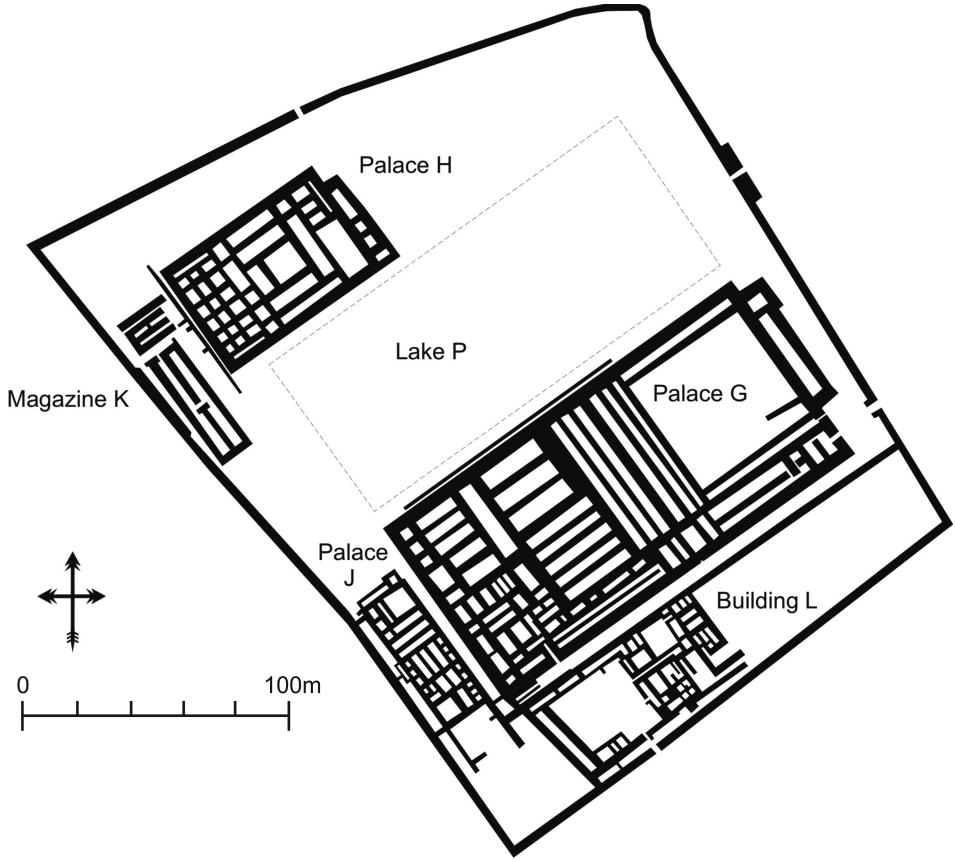

Fig. 4. The residential district from area H in Avaris.
Redrawn and simplified from Bietak 2010, fig. 28

of the foundations were diverse in size and shape, although mainly long and narrow. However, as was the case with Citadel C, the layout of rooms on the upper level could also be seen in the base. Of all the buildings, Palace F stands out, because it is the densest construction and was later reconstructed as a defensive citadel. Palace G, the most impressive and biggest, is interesting from a structural point of view, as some of the inner compartments of its platform were accessible from the ground. These rooms were mainly located in the longer, southeastern side of the foundation and they would have been used as bathrooms, diverse utility rooms and staircases. There is no evidence of the usage of platform chambers in this way in the other palaces of the area. Indeed, the only place with a slight similarity to it is the first palace from area F/II. Apart from the aspects mentioned above, the newer palaces had a few other important features. For the first

time, the main courtyard (really large in the case of Palace G) was not only located in front of the building, but also at the same level as the rest of the rooms. Moreover, the fully axial layout of the palaces now possessed a typically Egyptian arrangement of rooms (also recognisable to a certain extent in Citadel C), with the residential quarters located in the back part of the building (cf. Badawy 1966a, 20-33; Arnold 1999; Koltsida 2007).

Finally, another kind of building constructed using the casemate technique must also be mentioned. This is the Chapel of Queen Tetisheri in Abydos (Fig. 5), built by the first king of the 18th Dynasty, Ahmose (Currely 1904, 35-35). These structures are significant due to the symmetrical layout of their cells and their almost square plan, which is a forerunner of much later casemate platforms of the 1st millennium BC. Similarly to the earlier structures, the inner chambers were long, narrow and filled in with earth. The Chapel of Queen Tetisheri is also the first fully cult building to have been built using casemate construction.

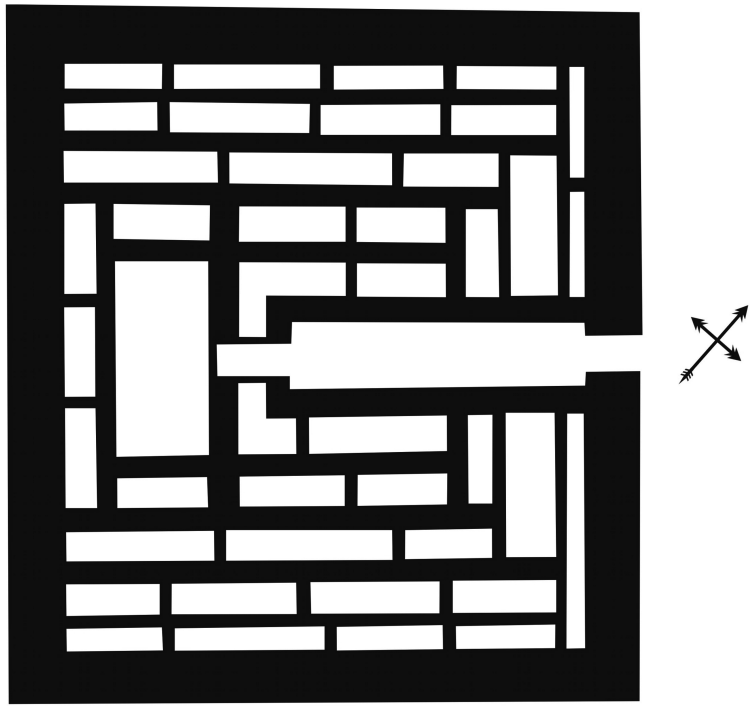

Fig. 5. The chapel of Queen Tetisheri in Abydos.
Redrawn and simplified from Curelly 1904, pl. LI

External influences?

One of the most crucial issues concerning early casemate structures in Egypt is the question of their origin. Over the last several years, a few hypotheses have been put forward. As they are relevant to this paper, they will now be discussed in brief.

The most significant popular theory is that casemate foundation usage in Egypt is of Levantine origin. M. Bietak (1996, 68-70; 2010, 21-22), the discoverer of the famous palaces of Avaris, has made mention of the Near Eastern features of these structures and linked their appearance to the activity of the Hyksos. In his opinion (Bietak 2010, 21), the remains of the early 15th Dynasty palace in area F/II may be closely related to Syrian-type palaces known from Ebla Q and Mari of the Middle Bronze Age, as well as Alalakh and Ugarit of the Late Bronze Age. Features supporting this theory are the palaces' lack of a central axis, their compact layout and segmentation into juxtaposed quarters, the number of storerooms they had and the existence of towers jutting out of their façades.[1] Furthermore, Bietak (2010, 21) believes that the casemate structure of both these and later palaces from Avaris area H derives from casemate bastions from the fortifications of Middle Bronze IIA Ebla, Gezer and Hazor (for the description of these buildings see Kempinski 1992a, 132). Such features can be observed in all of these places and some may have appeared due to the Asiatic origin of their Hyksos rulers.

Two structural aspects are of great interest, particularly in the case of the earliest palace. Firstly, a staircase tower located to the southwest of its courtyard (B), known as '*Treppenhaus* 2', is extremely similar to a tower found at Tel Gezer (Fig. 6). In addition, a ramp that runs partly parallel to the complex (A) and completely parallel to a shorter side of the platforms of Palaces F, G and J may well be related to gates on a bent axis known from Levantine cities (cf. Megiddo: Kempinski 1992a, 133, fig. 15). This feature is more pronounced than the generally perpendicular ramps of Egyptian architecture (cf. pyramid complexes of the Old and Middle Kingdoms: Badawy 1954, 123-156; Badawy 1966b, 96-121).

It is also necessary, however, to highlight features that are not necessarily indicative of Asian origin. Firstly, structural segmentation can

[1] Due to limited space, it is not possible to present a complete description of Levantine architecture in the Middle and Late Bronze Ages. The most basic, complete data is provided by: Kempinski and Reich (eds) 1992 (in particular Oren 1992; Kempinski 1992a) and Śliwa 1997, 136-179. There is no satisfying study which compares the specifics of Egyptian and Near Eastern architectural elements. For a more general overview, the most important publication is Badawy 1966b.

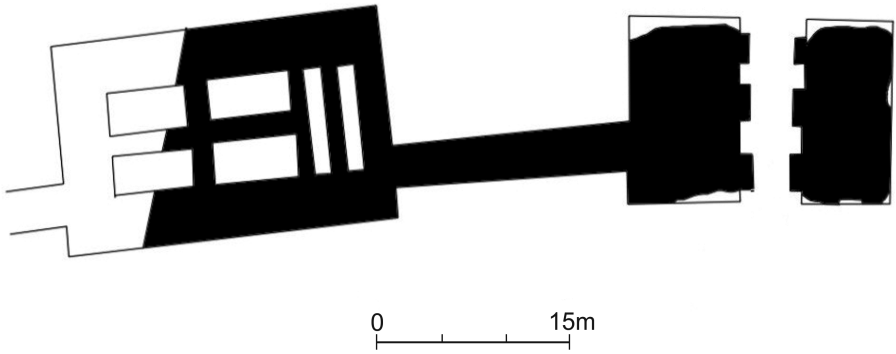

Fig. 6. Fragment of the city fortifications of Tel Gezer.
Redrawn and simplified from Kempinski 1992b, fig. 13

only be observed in the case of the earliest palace, the one from area F/II in Avaris and, to a certain extent, the North Palace in Deir el-Ballas. The South Palace and the palace from area H in Avaris are both examples of developed casemate architecture and already have its typical axial structure. After the initial mixed patterns of the early Hyksos palace, the later North Palace of Deir el-Ballas features a more symmetrical layout, which is a development towards the block axial structures of later buildings. Typically Egyptian elements begin to become visible in the early 15th Dynasty palace. These can be seen in extensive warehouse complexes (A), (E) and (G), which contain the long, vaulted chambers that are found in Egyptian architecture from the Predynastic period onwards. Similar storerooms have been discovered in a residential complex in Buto (Zierman 2002, 479; Hartung 2008, 1209-1213) and next to Khephren's pyramid in Giza (Hölscher 1912, Blatt II). The relationship between storerooms and official architecture (such as palaces and fortresses) has been demonstrated for the Middle Kingdom by B. J. Kemp (1986), who linked large, granary buildings known from a Nubian fortress and the large houses of Kahun with administrative functions. As a result, there is no reason to link them to storeroom areas from Levantine palaces such as Qatna (Bietak 2010, 21), since analogous examples are known in Egyptian architecture. Finally, the previously mentioned axial layout of most palaces (and also the Chapel of Tetisheri) with private quarters located in the back part of the buildings indicates that casemate architecture was quickly integrated into local architectural customs.

A hypothesis established by P. Lacovara (1983, 159; 2006, 192-193) links the usage of casemate techniques in Egypt with the evolution

of the great tumuli of Kerma. The main examples used to support this theory are tumuli K III (Fig. 7) and K X, which possess long, narrow inner casemates covered by brick paving (cf. Lacovara 2006, fig. 5). Lacovara links these constructions with analogous long, narrow chambers in the platform of the North Palace of Deir el-Ballas. Although this seems to be a very attractive hypothesis, it does not prove any true connection between Nubian and Egyptian construction techniques. It is far more likely that the long, inner compartments of the great tumuli were created with the aim of structural strengthening and to protect against any decay of the artificial mound. In addition, casemate chambers from Egypt and the Near East were a part of the foundation of the building; the cells inside the Kerma tumuli did not play this role. Various types of tumulus inner construction are known from different cultures of the world, sometimes quite elaborate and sometimes quite similar to Nubian examples (cf. kurgan of Arzan near Tuva, southern

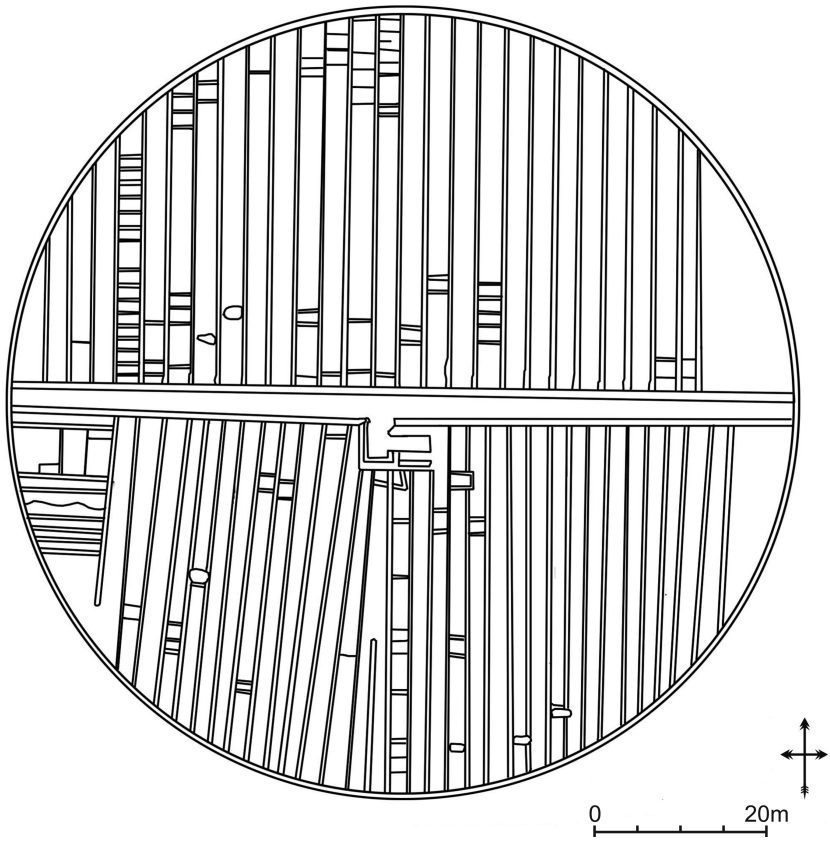

Fig. 7. Tumulus K III from Kerma. Redrawn and simplified from Trigger 1976, fig. 28

Siberia: Gryaznov 1980; Kuilman 2011, 465-467). There is therefore no cause to link the discussed chambers with Egyptian foundation techniques. Furthermore, the dating of these structures to the 2nd Intermediate period (Trigger 1976, 89-93), a time when the evolution of Egyptian casemate buildings can already be seen to be in progress, makes such origins seem improbable.

Evidence for casemate foundation platforms being of Egyptian origin

The theory that casemate techniques were borrowed from abroad appears tempting because of the regularity with which this form of construction was used by the various cultures of the eastern Mediterranean. Nevertheless, it should not be forgotten that differences existed in the way the various architectural traditions employed them, one of the most important being the building material used. Whereas Levantine casemate structures of the Middle and Late Bronze Ages were erected using bricks on a stone foundation (Kempinski 1992b, 97-98), Egyptians built completely brick buildings (Małecka-Drozd 2012; Małecka-Drozd 2013). Furthermore, apart from smaller structures (such as defensive towers or city gates) from various sites, there is no example of a proper casemate platform in a Near Eastern building from the Bronze Age (cf. Śliwa 1997, 136-179).

As evidence of the external origin of casemate architecture in Egypt is not convincing, there must therefore be data that suggests that this structural form is a local creation. The first example of such a casemate foundation could perhaps come from Tell el-Farkha's early Naqadian Residence (Ciałowicz and Jucha 2003, 32), but research has not been able to confirm this interpretation. P. Lacovara (1983, 159) previously cited the Middle Kingdom fort at Abu Rawash as an example, but this argument fell apart when the structure was dated to the Late period (Spencer 1979, 107). In any case, there are certain factors that suggest the local provenance of casemate foundations, many connected with the development of funerary architecture.

The Egyptians had significant knowledge of foundation techniques, the qualities of building materials and construction methods (Spencer 1979; Clarke and Engelbach 1990; Arnold 1991; Aston *et al.* 2000; Kemp 2000). From the very beginning, the most important building material was soil. This was initially used as shapeless lumps of mud, before it was made into regular, rectangular bricks. There were two main types of brick,

mud and sand, the specific properties of which determined the manner of their use. Bricks with a high sand content were very strong in a dry environment but susceptible to erosion by water. These were therefore favoured when strengthening particular elements of a structure (cf. Spencer 1979, 55; Bietak and Forstner-Müller 2006, 68). Conversely, mudbricks (which contained more clay) were weaker but more resistant to moisture. For this reason, mudbricks were most readily used underground to create a building's foundations (Arnold 1991, 114). The local population started to line their burial pits with mudbricks as early as the Predynastic period, thus dividing the space into several chambers (Ciałowicz 1999, 237f.). It can only be assumed that one of the reasons for the development of such a practice was the desire to protect the remains from the seepage of ground moisture (cf. Pisarczyk 2001, 16), as well as to create a more standardised form of desert grave. At first glance, a striking resemblance can be noted between casemate foundation platforms and a specifically Egyptian type of tomb, the mastaba. The peripheral walls of the Egyptian construction enclosed a space divided into cells by inner walls. Since both casemate foundations and mastabas in all probability originated in the Nile Delta (Małecka-Drozd 2012, 80-90; Małecka-Drozd 2013, 89-101), the similarity mentioned above merits further investigation. The earliest mastaba burial was discovered at the Tell el-Farkha cemetery and dates to the Naqada IIIA2/B1 period (Ciałowicz and Dębowska-Ludwin 2013, 154-156). Despite the fact that we cannot be completely sure that the structure was used as a grave, there seems to be no other convincing explanation of its purpose. The mastaba's solid brick structure (Fig. 8), with thick outer walls and inner chambers intentionally filled in with earth, mud and bricks, make it a plausible forerunner to casemate foundations.

The growth of popularity in mastaba tombs in Egypt during the Archaic period (Fig. 9) is also significant. Its classic, most developed form is known from a few necropoleis, most notably those of Saqqara (Emery 1949; Emery 1954; Emery 1958) and Tarkhan (Wainwright 1913; Petrie 1914). In this form, the wider outer walls enclose a rectangular space, which is then divided into cells by thinner ones. These are not bound together, which was common practice in both tombs and casemate foundations. Certain chambers were used as storerooms, whilst the rest were filled in with earth, sand or gravel. A good example of this practice is a reconstruction of Mastaba 3503 from Saqqara (Emery 1954, pl. 38), in which the upper part of the structure (located above the storerooms) is filled in with earth and rubble. From the Old Kingdom onwards, mastaba tombs became more

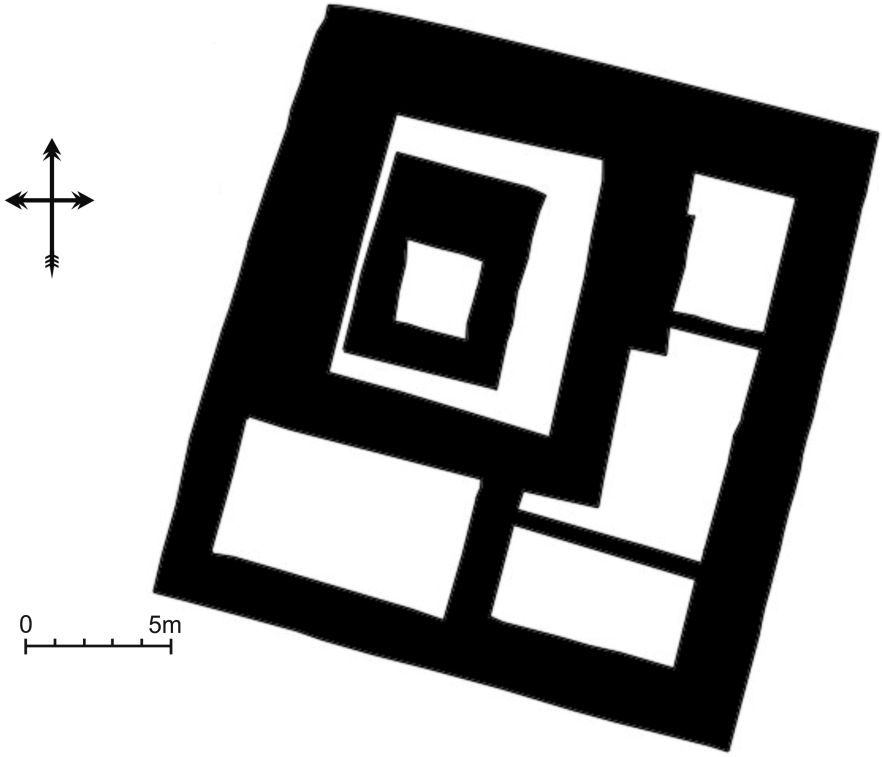

Fig. 8. Mastaba from cemetery of Tell el-Farkha.
Redrawn from Ciałowicz and Dębowska-Ludwin 2013, fig. 1

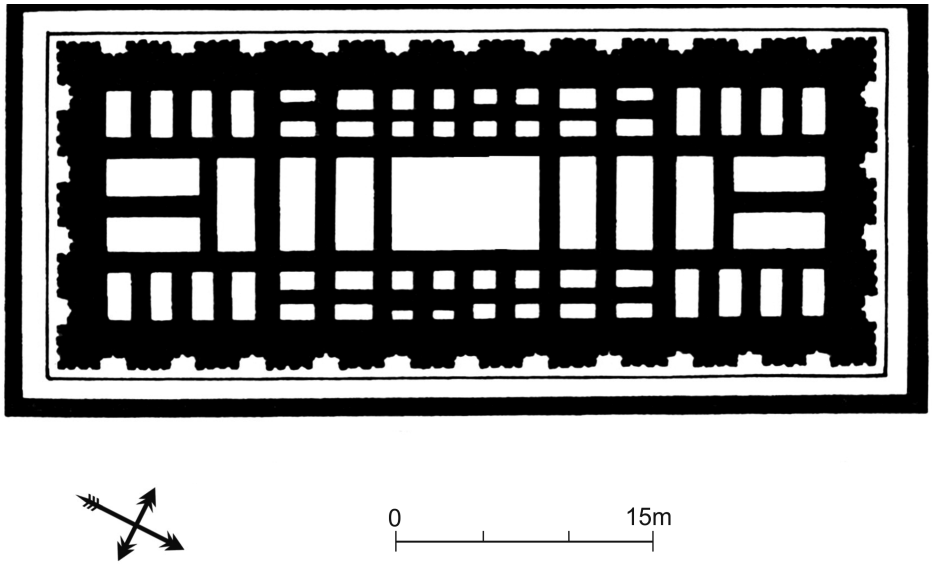

Fig. 9. Mastaba no. 3504 from Saqqara, 1st Dynasty.
Redrawn and simplified from Ciałowicz 1999, il. 145

simplified, with a number of inner compartments being replaced by a block structure with a chapel and shaft to the underground burial chamber (cf. Badawy 1954, 157-173).

Another element of Egyptian architecture that could have influenced the emergence of the casemate structure is that of its foundations, in particular its foundation platforms. Although it is questionable as to whether structures such as the artificial mound surrounded by a retaining wall in Hierakonpolis (Quibell and Green 1902, pl. LXXII) can be deemed a form of foundation platform, it remains an important example of the Egyptian temple building tradition. Temples erected on this kind of foundation are attested from the Old Kingdom onwards. One of the better known and oldest is the stone platform under the upper temple of Mycerinus at Giza (Reisner 1931, 73-74). As for brick foundations of the type, the huge platform under the temple of Banebjed in Mendes is a notable example. This structure had a depth of 50cm and rose to two metres above ground level. As a publication on the feature has not yet appeared, we do not know the exact details of the platform's construction, but it has been assumed that it may cover remains of temples from earlier periods (Redford 2010, 38-40). During the second part of the Old Kingdom, temples were also built on foundation platforms. Examples come in the form of solar temples such as the one raised by Userkaf in Abusir (Ricke 1954, 312-314), as well as mortuary temples such as the valley temple of Niuserre (Borchardt 1907). In the Middle Kingdom, platform foundations with perpendicular causeways continued to be built. As we do not know of any valley temples from pyramid complexes of the 12th Dynasty, we can only assume that their construction was similar to those of the Old Kingdom. In any case, certain other examples indicate that the erection of edifices using a platform as a structural element was popular at this time (cf. mortuary temple of Mentuhotep II in Deir el-Bahari: Badawy 1966a, 53-59). Platform type foundations are certainly present in at least a few temples, such as the mortuary temple of Sesostris III at Abydos (Randall-MacIver and Mace 1902, 57-60; Badawy 1966a, fig. 25) and the White Chapel of Senusret I at Karnak (Chevrier and Lacau 1956).

Why casemate architecture?

It is clear that structures and construction techniques that could have influenced the emergence of casemate foundation platforms existed in Egypt centuries before Hyksos domination in the 2nd Intermediate period. There are also tumuli older than Nubian ones in Kerma. At least some of these

could have come into being in similar conditions to the casemate platform. One recent hypothesis has suggested that the high Nile floods of the middle of the 2nd millennium BC had an impact on the emergence of the casemate platform (Szafrański 2003) and this has also been connected to a similar situation in the Late period (Małecka-Drozd 2012; Małecka-Drozd 2013), as well as other factors.

There are several periods in the history of the Egyptian civilization in which the activity of the Nile greatly increased and flood levels rose. The first time such a situation has been noted was at the turn of the 4th and 3rd millennia BC (Butzer 1976, 28; Said 1993, 143-149), when the first mastabas emerged. This was also the time when Egyptian theology and mythology developed, with the legendary primeval mound as one of its most important elements (Ricke 1935). The floods were also one of the reasons for the construction of temples on artificially elevated hills or platforms, even if they were not directly threatened by water. During the Old Kingdom, a gradual drying up of the climate and a resultant decrease in flood levels occurred, which led to disaster in the 1st Intermediate period (Bell 1971; Said 1993, 138-142). Changes in mastaba construction, which involved a notable simplification of the structure and a departure from the complicated quasi-casemate technique, can be attributed to this alteration in the climate. The next period of increased humidity and higher Nile floods occurred during the Middle Kingdom and the 2nd Intermediate period (Bell 1975, 226-247; Said 1993, 143-149) and can be dated to *c*. 1850-1500 BC (Szafrański 2003, 211). This is attested by graffiti from a Nubian fortress from the reign of Amenemhat III, as well as by archaeological evidence, such as the layers of mud above Middle Kingdom settlements in Abu Ghalib (Larsen 1936, 46, 48ff) and Kom Rabia (Szafrański 2003, 211).

This brief insight into the climatic history of Egypt has given us some interesting results. Since the connection between casemate platforms and high floods seems to be convincing, the temptation exists to create a similar link between the high humidity of the Neolithic Wet Phase (Bell 1971, 3-6) and the invention of complicated mudbrick tombs and their mastaba superstructures. The properties of the material used also played an important role in funerary architecture and the construction of casemate foundations (Małecka-Drozd 2012, 73-74). When exposed to moisture, the shear and compression degrees of mudbrick walls increase (cf. above; Pisarczyk 2001, 16) and minerals present in the soil toughen the structure (Spencer 1979, 116-117). Sand mixed with earth and rubble was therefore used to fill the inner compartments of both mastabas and casemate foundations to give

more stability to the structure, since the shear and compression degrees of this mixture are not affected by moisture (Pisarczyk 2001, 16). It also does not become deformed by the weight of the structure it is supporting and is therefore a great stabiliser during earthquakes (Arnold 1991, 114). It should come as no surprise that the Egyptians possessed this knowledge and that they were able to make use of it after a period of trial and error (cf. Szafrański 2003, 213-217; Małecka-Drozd 2012, 80-90).

The emergence of casemate foundation platforms in the 2nd Intermediate period can therefore be seen as the result of the application of earlier knowledge from domestic (or residential) architecture. It could also be partly down to a necessary shifting of settlements to more vulnerable areas as a result of population growth. As K. W. Butzer (1976, tab. 4) has noted, the population of Egypt more than doubled between 3000 and 1800 BC, with a threefold increase occurring in the Nile Delta. Recent research conducted has confirmed these calculations. In ancient Avaris, the size of the settlement rose from 75ha at the end of the Middle Kingdom to 250ha in the 2nd Intermediate period (Bietak 2010, 11-12). Area H and its vast residential complex on the banks of the Pelusiac branch of the Nile (dating to the late Hyksos and early 18th Dynasty periods) was also inhabited at this time (cf. Bietak 2010, fig. 9a-d). It should be noted here that the fully developed form of casemate foundation platform was not erected before the shifting of the residential, royal district to area H, which would presumably have occurred when ground water levels were higher.

Conclusion

Over the course of this paper, I have presented various aspects of Egyptian casemate structures from the 2nd millennium BC and discussed their possible origin. It has been noted that there are strong indications that the form originated locally, but there is one more issue that must be addressed.

The early Hyksos palace from area F/II of Avaris can be seen as the one with the most obvious links to Near Eastern architecture due to its bastion and layout segmentation. Here, some casemate chambers consisting of compartments situated along one courtyard (B) created a thicker palace wall, a trait which directly corresponds to Levantine constructions (cf. Kempinski 1992a; Oren 1992). However, it is not a true example of a building erected on a foundation platform, whether it be casemate or not. At least some of the compartments considered to be casemate were filled

in during a later phase of exploitation of the building. It can be assumed that this must have been done for a reason, perhaps out of the desire to protect the complex of storerooms from moisture or other typical threats. In their classic form, casemate foundations from the end of the 2nd Intermediate period and the New Kingdom (in both Avaris and Deir el-Ballas) no longer possess Asiatic features (with the exception of the parallel ramp). From the New Kingdom onwards, an increasing number of local traits derived from the earlier architecture of the region, become visible.

Taking all this into account, it seems probable that casemate foundation platforms are simply the result of the local evolution of construction techniques. All the characteristic features of casemate platforms had been known in Egyptian architecture centuries beforehand. These include the knowledge of the properties of building materials (mudbrick and sand) and their reaction to contact with water and humidity, block structures divided by inner walls into several compartments, the strengthening of the structure by filling in its interior with earth and rubble and the raising of important edifices using artificial hills and foundation platforms. Any Near Eastern features present in casemate palaces from the Hyksos period therefore seem to be a rather superficial imitation of techniques developed elsewhere. They were relatively quickly adapted to incorporate the advantages of Egyptian construction techniques more suited to the alluvial conditions of the Nile Delta.

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Natalia Małecka-Drozd
c/o Institute of Archaeology
Jagiellonian University
nbmalecka@gmail.com