

**FWF Project P 34601**  
**PALATIAL ARCHITECTURE IN EGYPT AND ITS SPATIAL SEMIOTICS:**  
**HYKSOS AND EGYPTIAN PALACES AT AVARIS/TELL EL-DAB'A – PRELIMINARY**  
**RESULTS**

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**I. STATE OF THE ART**

**Report on the Current Project on Palatial Architecture and its Semiotics**

The site of Tell el-Dab'a<sup>1</sup> was originally established as a part of the colonisation policy of the early Middle Kingdom under Amenemhat I, intended to deter immigration from the East.<sup>1</sup> With its harbour facilities, it was most probably this site that served Amenemhat II as a base for his maritime expeditions.<sup>2</sup> From the reign of Amenemhat III onwards, Tell el-Dab'a developed into a hub for external trade and attracted

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<sup>1</sup> General literature of the site: HABACHI 1954; 2001; VAN SETERS 1966; BIETAK 1975; 1981; 1996a; 1997; 2022b.

<sup>2</sup> ALTENMÜLLER & MOUSSA 1991; ALTENMÜLLER 2015; MARCUS 2007.

immigrants from the Levant. Known as Avaris, it appears to have been the residence of the 14<sup>th</sup> Dynasty, and it gradually became widely accepted that it also served as the seat of the 15<sup>th</sup> Dynasty—the Hyksos.<sup>3</sup> In the 18<sup>th</sup> Dynasty, the site became the renowned port of Tuthmosis III and Amenophis II. During the 19<sup>th</sup> and 20<sup>th</sup> Dynasties, it formed the southern part of Piramesse, the residence of the Ramesside pharaohs.

Our project aims to publish the architectural remains and stratigraphy of three palatial structures excavated at Tell el-Dab'a. These buildings once played an important role in Egyptian history.<sup>4</sup> Our study includes a semiotic architectural analysis. Today, only the ground floors are preserved, and in some areas, just the foundations remain.

## **II. THE OBJECTS OF STUDY**

### **1. Area F/I: The 13<sup>th</sup> Dynasty Palatial Mansion: Probable Residence of an Asiatic Dignitary (Prince of Retjenu?)**

This building is embedded within a stratigraphy spanning the 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, and 15<sup>th</sup> Dynasties, comprising a total of ten occupation phases. As typical for Tell el-Dab'a, the stratigraphy is highly complex. The aim is to publish the results of the excavation of Area F/I, covering 7,900 m<sup>2</sup>.<sup>5</sup>

- (1.) A monograph on the overlying phases (G/1–3–E/2, c. 1710–1630 BCE) was published by M. MÜLLER in 2023.<sup>6</sup> This volume examines Egyptian architectural traditions, the integration of Near Eastern intramural burials, and the application of household archaeology.
- (2.) A second monograph, currently in preparation, focuses on the palatial mansion of the early 13<sup>th</sup> Dynasty (Phase G/4, c. 1815–1780 BCE).<sup>7</sup> South of it was an extended garden, which was later used as an elite cemetery. In connection with the stratum beneath (Phase H, Stratum d/2, c. 1850–1815 BCE), this monograph will also explore the influence of Near Eastern architecture, particularly the presence of a Syrian Middle-Room House (12.3 x 9.9 m = 122 m<sup>2</sup>), a type common in the northern Levant, which may represent a predecessor of the mansion.<sup>8</sup> Other Near Eastern architectural features, including Broad-Room Houses, also appear in this phase. The same stratum contains a small cemetery just south of the Middle-Room House. Further south a larger cemetery was situated, centred around a prominent tomb which was covered by a chapel. This part of the project is expected to conclude in early 2026.<sup>9</sup> The tombs have already been published by R. SCHIESTL.<sup>10</sup>

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<sup>3</sup> HABACHI 1954; 2001; VAN SETERS 1966; BIETAK 1975; 1981.

<sup>4</sup> BIETAK 2010a, 2010b; 2011; 2018a.

<sup>5</sup> BIETAK 1984; Eigner 1985.

<sup>6</sup> M. MÜLLER 2015; 2023.

<sup>7</sup> Preliminary report: BIETAK 1984; EIGNER 1985.

<sup>8</sup> *Ibidem*.

<sup>9</sup> BIETAK, EIGNER & MARTIN, in preparation.

<sup>10</sup> SCHIESTL 2009.

- (3.) This subproject will be published in two volumes (Tell el-Dab'a XIV.1): A monograph with the description and analysis and as a second part an atlas comprising 27 fold-out plans and 67 section drawings.

## **2. Area F/II: Remains of a Palace of Near Eastern Type**

This palace was most likely the residence of the Hyksos (15<sup>th</sup> Dynasty).<sup>11</sup> Beneath it lay the palace of their predecessors, the rulers of the 14<sup>th</sup> Dynasty. The palace covers an area of 10,500 m<sup>2</sup>, of which only two thirds (7,200 m<sup>2</sup>) have been excavated. The remaining section, located in an agricultural zone, could not be investigated, as it is no longer accessible. Nevertheless, the missing parts were explored through a magnetometer survey.

The stratigraphy comprises three phases dating to the Second Intermediate Period (14<sup>th</sup> and 15<sup>th</sup> Dynasties, c. 1710–1530 BCE).

The task is to digitise 230 plans and 183 section drawings from the excavation, and to compile them into a monograph, accompanied by a descriptive analysis and evaluation of the architectural remains.

The volume will further incorporate a 3D reconstruction, a stratigraphic atlas, and plans illustrating three phases of the site. It will also include a chapter on the semiotic interpretation of the architecture and a discussion of Near Eastern influences.

## **3. Area H/I–VI: Remains of a Tuthmosid Palace Compound, Consisting of Three Palaces within a 5.5 ha Enclosure**

Approximately 8,000 m<sup>2</sup> of this compound were excavated.<sup>12</sup> The remnants were partially explored through a magnetometer survey.

The project entails several major tasks:

- (1.) The preparation of a monograph describing the stratigraphy, including, both the phases underlying and overlying the palace precinct. Two additional monographs are already in advanced stages of preparation.
- (2.) The compilation of an atlas containing plans for five distinct phases, along with a selection of about 150 section drawings, chosen from around 350 coloured section drawings, which will be converted into black-and-white format for publication.
- (3.) The creation of a 3D model reconstructing the original architecture of the palace compound and its constituent palaces, based on the structural indications preserved in the remains and on the inferred functions of the distinct architectural elements.

Two of the palaces were once embellished with Aegean-style wall paintings, displaying emblems associated with the Palace of Knossos. Only about 10% of these paintings have been preserved. The fragments were

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<sup>11</sup> BIETAK 2010a; 2010c; 2010d; 2011; BIETAK & FORSTNER-MÜLLER 2005; 2006; 2007; 2009; BIETAK *et al.* 2012/2013.

<sup>12</sup> BIETAK 2005; 2018a; 2025.

not recovered in situ but were pieced together from thousands of shards dumped at the foot of the access ramp to the palaces. The publication will also include a chapter on the semiotics of the architecture.

#### **4. Semiotics of the Architecture<sup>13</sup>**

Each descriptive and analytical volume will include a chapter dedicated to the architectural semiotics. An analysis of the overall features of the buildings—including their scale, layout, wall thickness, the dimensions of storerooms—will form the basis for interpreting the architectural typology and its details. A functional analysis will further assist in identifying how the buildings and their individual components were used and what they represented.

Although most of the structures are preserved only at ground level, or survive merely as foundations, the application of semiotic methods remains fruitful. Even in this reduced state of preservation, the architectural “signs” can be successfully analysed, enriching the understanding of the functions of individual elements and providing a visual interpretation that extends beyond purely descriptive approaches.

### **III. ACHIEVEMENTS AND PROGRESS (AUGUST 2022 TO MARCH 2024)**

#### **1. Area F/I: The 13<sup>th</sup> Dynasty Palatial Mansion: Probable Residence of an Asiatic Dignitary (Prince of Retjenu?)**

Following the collection of all the documentation for Area F/I at Tell el-Dab‘a—including plans, plans, section drawings, photos and slides—and a detailed study of the site’s stratigraphy, M. Martin has completed c. 50% of the manuscript, based on preliminary studies by D. Eigner and the Principal Investigator.

The 67 coloured section drawings have been redrawn in black-and-white and their descriptions have been reviewed. Tell el-Dab‘a XIV.1 will be an analytical monograph and an atlas with section drawings and plans. Due to new findings, 8 to 10 of the 27 plans require redrawing using Illustrator, before their conversion into AutoCAD format. Minor corrections to the captions and legends are also necessary.

A semiotic analysis of the earlier of two phases (Str. d/1.2) indicates that the ground floor of this palatial mansion—covering over 2,500 m<sup>2</sup>—likely functioned as an administrative complex, where petitioners and applicants were first received at a portico before being channelled through a corridor into a waiting room, and subsequently admitted to the central reception room in a residence in the south.

To the right side of this reception room is a large magazine, where clients probably deposited their commodities. Afterward, they were guided to another waiting room on the opposite side of the courtyard before exiting via a separate corridor.

Behind the entrance portico, two identical sets of rooms are located, which most likely served as offices. The western part may have served as a registration bureau, where clients were recorded before entering the first waiting room; the eastern part appears to have received clients as they exited, probably to issue instructions or orders.

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<sup>13</sup> PRAK 1968; ECO 1980; 1988; KOVACS 2018; TRIGGER 1990; PFÄLZNER 2019.



*Fig. 1 Phase G/4, Str. d/1.1: The palatial mansion in Area F/I, with tree gardens, flower beds, irrigation ditches, and an elite cemetery to the south (early 13<sup>th</sup> Dynasty, c. after 1800 BCE).*

A broad, elongated stairwell between the two entrance offices suggests the presence of an upper floor, housing the apartments of officials responsible for overseeing the arrival and departure of visitors.

The two entrance apartments follow the typical layout of Middle Kingdom houses. The hierarchy of the two apartments and the residence in the south is evident in their size differences: while the main southern residence exhibits the typical triple-room plan of the El-Lahun House,<sup>14</sup> the two entrance units possess only a single side-room adjoining a back room; the latter arrangement is shared by all three units.

As the two front units were most likely equipped with an upper floor, it is reasonable to assume that the main building also had an upper floor, serving as the private accommodation of the patron. A narrow corridor terminating against a back wall could be reconstructed as a staircase. Here, too, the lower floor seems to have functioned as an office while the upper floor served as a residence.

For the first time, a major mansion of the Middle Kingdom can be identified with high probability as an administrative office, most likely tasked with the collection of taxes. Four hundred years later, during the Amarna Period, administrative offices were likewise modelled after domestic architectural forms.<sup>15</sup>

The later of the two phases (Str. d/1.1) of the palatial mansion does not exhibit as clear an itinerary as the previous one. It appears that there was an intention to convert the complex into more impressive residential premises. The large storeroom was dismantled, and in its place a side room, similar to those found in the

<sup>14</sup> Bietak 1996b.

<sup>15</sup> Borchardt & Ricke 1980; Kemp & Garfi 1993; Spence 2009. See also the representation of the "Foreign Office" in Piramesse: Borchardt 1907/1908, 59, fig. 1.

large El-Lahun houses, was created. The courtyard was enlarged westwards and the residence fitted with a portico, which was later extended by colonnades on the remaining three sides.



*Fig. 2 Tentative reconstruction of the functions of the individual rooms and spaces of the palatial mansion in the earlier (above) and later phase (below), based on a semiotic analysis of the architecture.*

At the eastern edge of the courtyard, a second, square reception room was constructed, its roof supported by two columns. As in the previous phase, clients entered the courtyard from the western side, approached the new reception room along the central axis, and exited through the former eastern corridor. A narrower corridor, probably intended for staff, made a detour on the eastern side.

It remains unknown where commodities were stored after the abandonment of the original storeroom. South of the mansion, a garden was discovered with systematically planted trees and plant beds, possibly flowerbeds. Notably, a sophisticated system of canals for the irrigation of the garden was also uncovered. As this system was too large to be supplied by bucket carriers, it is likely that a water-lifting device such as a shadûf was employed. This constitutes the earliest, albeit indirect, evidence for the introduction of the shadûf into Egypt—a technology that evidently accompanied Western Asiatic immigrants from northern Syria, probably from the middle Euphrates region, where such devices were known since the Akkadian Period.<sup>16</sup> In Egypt, thus far, pictorial evidence for the use of the shadûf appears only from the Amarna Period onwards.

The mansion appears to have remained in use for an extended period, as a cemetery developed within the former garden to the south, containing a series of elite tombs published by R. Schiestl.<sup>17</sup> The mansion was ultimately abandoned in the midst of a renovation process and while the construction of an additional, larger mansion was under way.

Workmen's tools were left behind, threshold stones had not yet been installed, and the doors were abruptly walled up before the precinct was abandoned. The evidence points to a sudden decision to cease activities, possibly prompted by a crisis.

The palatial mansion was constructed according to Egyptian architectural tradition but replaced a Near Eastern type of Middle-Room House from the preceding Phase H (Stratum d/2).

The elite cemetery south of the mansion displays Near Eastern burial customs, including the ritual slaughter of sheep and goats, paired donkey sacrifices, Middle Bronze Age weaponry, and both Egyptian and Near Eastern ceramic offerings.

An amethyst scarab mounted on a golden ring was found, inscribed with the title of a "Prince of Retjenu" bearing the name "Sobekemhat".

In the Phase H cemetery, an elite tomb contained a completely smashed limestone statue of an Asiatic dignitary, distinguished by a fungus-shaped coiffure.<sup>18</sup> It is possible that this statue represented a "Prince of Retjenu", with the title serving as an honorary designation bestowed by the Egyptian crown upon the highest-ranking dignitary of Western Asiatic ancestry at Tell el-Dab'a.

"Retjenu" referred to a broad geographical region, encompassing what is today Lebanon and the northern part of modern Israel—an area far too large to have been governed by a single ruler.<sup>19</sup> Inscriptions and representations on stelae from Serabit al-Khadem in the Sinai attest to the existence of a "brother of the

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<sup>16</sup> SALONEN 1965, 264-268.

<sup>17</sup> SCHIESTL 2009.

<sup>18</sup> SCHIESTL 2006.

<sup>19</sup> KOPETZKY & BIETAK 2016, 261.



Prince of Retjenu” who accompanied several expeditions to the mines and, according to a stela, was represented among Egyptian officials in Egyptian outfit.<sup>20</sup>

Prior to the construction of the Hyksos Palace (see below), another palace of Near Eastern typology had been destroyed by fire. Among the finds was another seal of a “Prince of Retjenu”, bearing a Byblite royal name and thus suggesting that the individual was either of Byblite origin or descended even from the Byblite royal family.<sup>21</sup> However, the bulla was made from Egyptian clay, supporting our view that the “Prince of Retjenu” resided at Tell el-Dab’a. Based on current progress, completion of the manuscript is scheduled for early 2026.

## **2. Area F/II: Remains of a Palace of Near Eastern Type from the Hyksos Period**

This project required extensive preparatory research in the archives of the Austrian Academy of Sciences and the Austrian Archaeological Institute in Cairo. S. Prell collected all coloured drawings of the plana and section drawings, along with field photographs and slides. A significant amount of time was also needed to transfer the excavation documentation into a database, a task undertaken across all sub-projects. The phase plans were subsequently digitised in AutoCAD.

As the structure is not an Egyptian type of palace but, based on its architecture, a royal residence of Near Eastern style—with features known from palaces in northern Syria, southeastern Anatolia, and northern Mesopotamia—the researcher initiated an in-depth study of Near Eastern palaces of the Middle Bronze Age.<sup>22</sup>

The architecture, as far as excavated, displays the typical additive elements of a Near Eastern palace.

The entrance complex in the northeast, with a gate flanked by two door towers, a plaza, and a second gate, finds close parallels in the palaces of Mari, Tell Bi’a, Kish B, Uruk, and several later examples.<sup>23</sup>

The southern courtyard, characterised by double walls, a buttress tower projecting westward, and a cult platform attached to the inner side to its eastern wall, shows parallels with Palace Q at Ebla,<sup>24</sup> and in the case of the cult platform, also with the central courtyard of the Old Assyrian Palace at Assur.<sup>25</sup> A buttress tower containing a staircase is also found at the palace at Tilmen Höyük.<sup>26</sup>

Attached to the western edge of the forecourt was a broad-room temple with four columns aligned along its transverse axis—an archaic feature known from Early Bronze Age temples in the southern Levant. Only at Nahariya has such a temple been excavated from the Middle Bronze Age.<sup>27</sup>

In our studies on the temples of Area A/II, another form of archaism was recognised: a large circular altar appearing in the latest two phases of the large broad-room temple within the sacred precinct—a

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<sup>20</sup> GOLDWASSER 2012/2013, 357, fig. 10, the last official on the stela.

<sup>21</sup> BIETAK 2022a, 258–265.

<sup>22</sup> BIETAK & FORSTNER-MÜLLER 2006; 2007; 2009; BIETAK 2010A–C; 2011; BIETAK *et al.* 2012/2013.

<sup>23</sup> BIETAK *et al.* 2012/2013, figs. 3, 10, 12.

<sup>24</sup> MATTHIAE 2010, 257–265, 442–448, fig. 239; BIETAK *et al.* 2012/2013, figs. 3, 5.

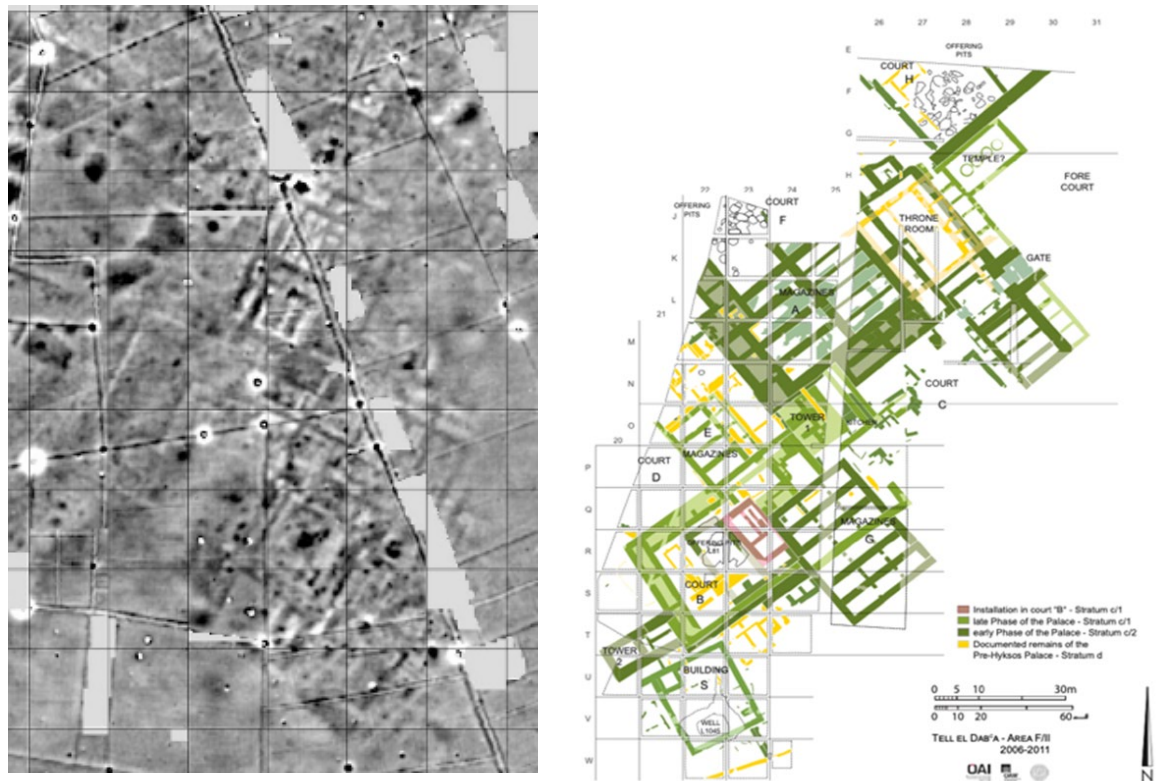
<sup>25</sup> PEDDE & LUNDSTRÖM 2008.

<sup>26</sup> MARCHETTI 2006, fig. 1.

<sup>27</sup> DOTHAN 1956; 1957.



phenomenon that requires further study to be fully understood. Parallels for such altars normally date to the Early Bronze IV Period.



*Fig. 3 The Hyksos Palace. Left: the result of the geophysical survey using a fluxgate magnetometer, conducted by Thomas Herbich (Polish Academy of Sciences), right: the overall plan.*

The temple added to the Hyksos palace at Tell el-Dab'a finds parallels in temples integrated into palatial complexes of the Middle Bronze Age and earlier in the Levant, such as those in Alalakh,<sup>28</sup> Karkemish,<sup>29</sup> Ebla (Palaces P and Q),<sup>30</sup> Mari,<sup>31</sup> Tell Asmar,<sup>32</sup> Ur<sup>33</sup> and from the Late Bronze Age Tell Brak.<sup>34</sup>

In the forecourt, several pits containing severed right hands were found directly in front of the throne room.<sup>35</sup> This practice is attested in New Kingdom Egypt, where it was carried out as a form of trophy counting after battle. Mounting evidence from glyptic art suggests that this gruesome custom originated in Western Asia and was introduced during the Hyksos Period.

Semiotic studies rank the size of the palace behind those of Mari, Ur, Qatna, the King's House at Amarna, and approximately on par with the Old Palace at Assur. It is larger, however, than the palaces at Malqata,

<sup>28</sup> WOOLLEY 1955, 91–106, fig. 35.

<sup>29</sup> WOOLLEY 1952, 167–175, pl. 29; MARCHETTI 2016, fig. 2. In Karkemish the temple is not directly attached to a palace but is at the left side to the entrance of the stairs leading to the acropolis.

<sup>30</sup> MATTHIAE 2010.

<sup>31</sup> PARROT 1958, 245–279, figs. 288–338, pl.53–55, plan, temple in the southeastern quarter of the palace; MARGUERON 1982, 545; 2004, 197–227, 254–259, 268–269; 2014, 84, 107–115.

<sup>32</sup> FRANKFORT, LLOYD & JACOBSEN 1940, pl. 2; HEINRICH 1982, 163–164, fig. 239; 1984, fig. 25.

<sup>33</sup> BIETAK 2018b, 12–16, fig. 5.

<sup>34</sup> OATES, OATES & MACDONALD 1997, 13–18, figs. 4, 28.

<sup>35</sup> BIETAK *et al.* 2012/2013, 31–32, fig. 14A–C; GRESKY *et al.* 2023.

Ebla P, Ebla Q, Ugarit, Alalakh VII and IV, and Deir el-Ballas South. Thus, it belongs firmly within the category of royal palaces in both Egypt and the Near East.

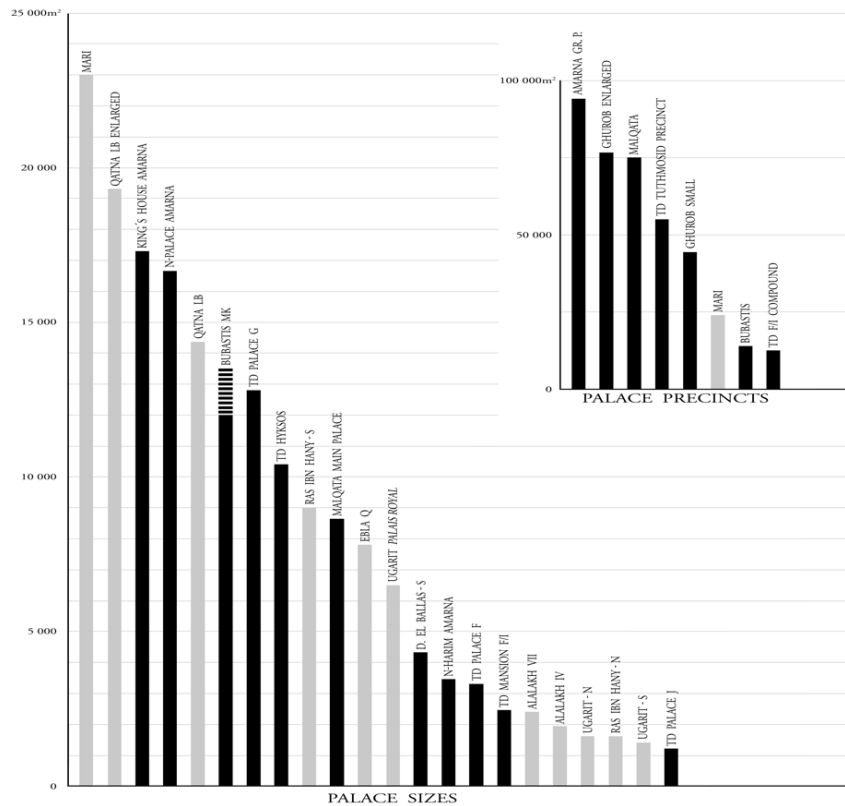


Fig. 4 Sizes of Egyptian and Near Eastern palaces and their precincts.

The palace's magazines occupy one fifth of the total area (2,200 m²), indicating that it served as the centre of a substantial revenue region, including external trade with the Near East. A central square tower, measuring roughly 20 metres per side, most probably served as an interface between the different parts of the palace, suggesting the existence of an upper floor.

The absence of residential quarters in the excavated areas may be explained either by the unexcavated sections or, more likely, by apartments on an upper floor above the magazines near the throne room. These quarters could have been accessed via a staircase within the central tower.

A ritual quarter was situated in the southern part of the palace, where benches were arranged in a rectangular layout, with the previously mentioned cult platform located at the eastern short side. Beneath the benches, and cutting into them, pits were found filled with remains of ritual repasts, including broken pottery, ritual ware, animal bones, and ashes. This southern court is therefore considered an example of a *Marzēah*, where ritual repasts took place. The ceramic material is currently under study by D.A. Aston.<sup>36</sup>

<sup>36</sup> Preliminary reports: ASTON et al. 2009; BIETAK & BADER 2015.

The large northern gate led into a plaza, which passed to the right of the throne-room and continued to a second gate, leading into a spacious courtyard. Approximately 10 m behind the second gate stood a large podium aligned with both gates. Whether this podium functioned as a cult installation—possibly for a statue—or as a platform for an officiant or dignitary addressing an audience assembled in Court C remains to be studied.

In its later phase, the palace's water supply was provided by a deep rectangular well, a type that finds parallels at major sites in the Levant. Its depth indicates that subsoil water could only be accessed 3.5 m below the present average ground level.

Beneath this palace lay an earlier palace of similar plan, which had been destroyed in a conflagration. This destruction suggests that the takeover by the 15<sup>th</sup> Dynasty (the Hyksos) was not peaceful. The preceding dynasty may have originated from Byblos. As mentioned above, a seal impression from the Green Jasper Workshop, bearing the name of a "Prince of Retjenu"—*Ipy-shemu*, a Byblite name—was found among the burned remains of the older palace's magazines.<sup>37</sup> This was not an import docket: the seal was pressed into a bulla made of Egyptian clay and bore the impression of papyrus, indicating that it was used to seal an official document, probably a letter. Taken together, this evidence strongly suggests that this dignitary resided at Avaris.

The geophysical survey revealed structures resembling large chamber tombs in the palace precinct east of the main palace. However, it remains unclear whether these belong to the earlier palace or to the Hyksos-period palace.

An article presenting the preliminary results of this sub-project will be ready for publication this year, while the monograph on the architecture, its Near Eastern comparisons, including the section drawings and other documentation is currently in preparation.

### **3. Area H/I–VI: Remains of a Tuthmosid Palace Compound Consisting of Three Palaces**

In October 2023, J. Posch began collecting the documentation of the Tuthmosid palace precinct from the archives and digitising the overall plans of all phases: the early workmen huts, the two phases of the palace, and the later Ramesside layers.

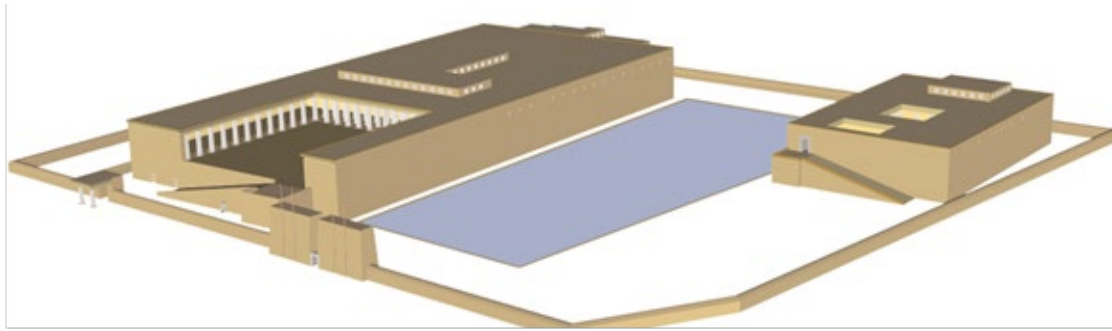
S. Poplawski drew the plans and internal sections of Palace F in AutoCAD and studied the possibilities for a 3D reconstruction of the palace. To achieve the most accurate reconstruction, all architectural possibilities must be tested against common patterns in Egyptian sacred, funerary, and palatial architecture. He is now working on the 3D reconstruction of the largest structure, Palace G, a task scheduled for completion this year.

By 2026, the five overall plans and the descriptive manuscript on the palace precinct, along with the manuscript on the stratigraphy, are expected to be completed.

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<sup>37</sup> MATH in: BIETAK *et al.* 2012/2013, 32–45, figs. 15, 16, 20A, 21, 28.

The overwhelming quantity of approximately 350 coloured section drawings and detailed plans necessitates a careful selection for publication; this task still requires an extended period of intensive work and cross-comparison.



*Fig. 5 3D reconstruction of the Tuthmosid Palace precinct.*

### **Palace F Architecture**

Semiotic analysis of the architecture of Palace F has revealed new insights. Only the foundation platform on which the palace was built is preserved. Because the substructure had to support the weight of the rising walls, its design reflects the intended spatial organisation of the superstructure, making a reconstruction of the internal layout possible.

One of the two key indicators was the gridwork of walls at the rear of the palace. This made it possible to distinguish three architectural elements. The central element, which contains the largest grid spaces, corresponds to the positions of four columns placed at the junctions of the cross walls.

By comparing the layout with the plans of smaller palaces—such as those of the Ramesseum and Malqata, and the El-Lahun-House—it became clear that the layout was intended for a reception or throne room with four columns in the centre, a side room with two columns to the east, and a bath or bedroom to the west.

The central courtyard, lined with foundation walls, provides a clear basis for reconstructing a cloister-like corridor around it. Whether the roof was supported by pilasters or columns is at first sight difficult to determine, but given the building's palatial function, columns are the more likely solution, but pilasters were also used in New Kingdom palatial architecture.

A second key architectural feature consists of two corridors: a wider one on the western (right) side, and a narrower one at the eastern (left) side. The large houses at El-Lahun display a clear parallel, with one wide and one narrow corridor used respectively by patrons and visitors on one side and by household staff on the other. Applying the same logic to this palace has also clarified the position of the doorways.

An alternative interpretation—similar to that proposed for the early 13<sup>th</sup> Dynasty mansion—suggests that the western passage may have been used for incoming visitors, and the eastern corridor for those departing. However, significant difference in the widths of the two corridors argues against this interpretation.

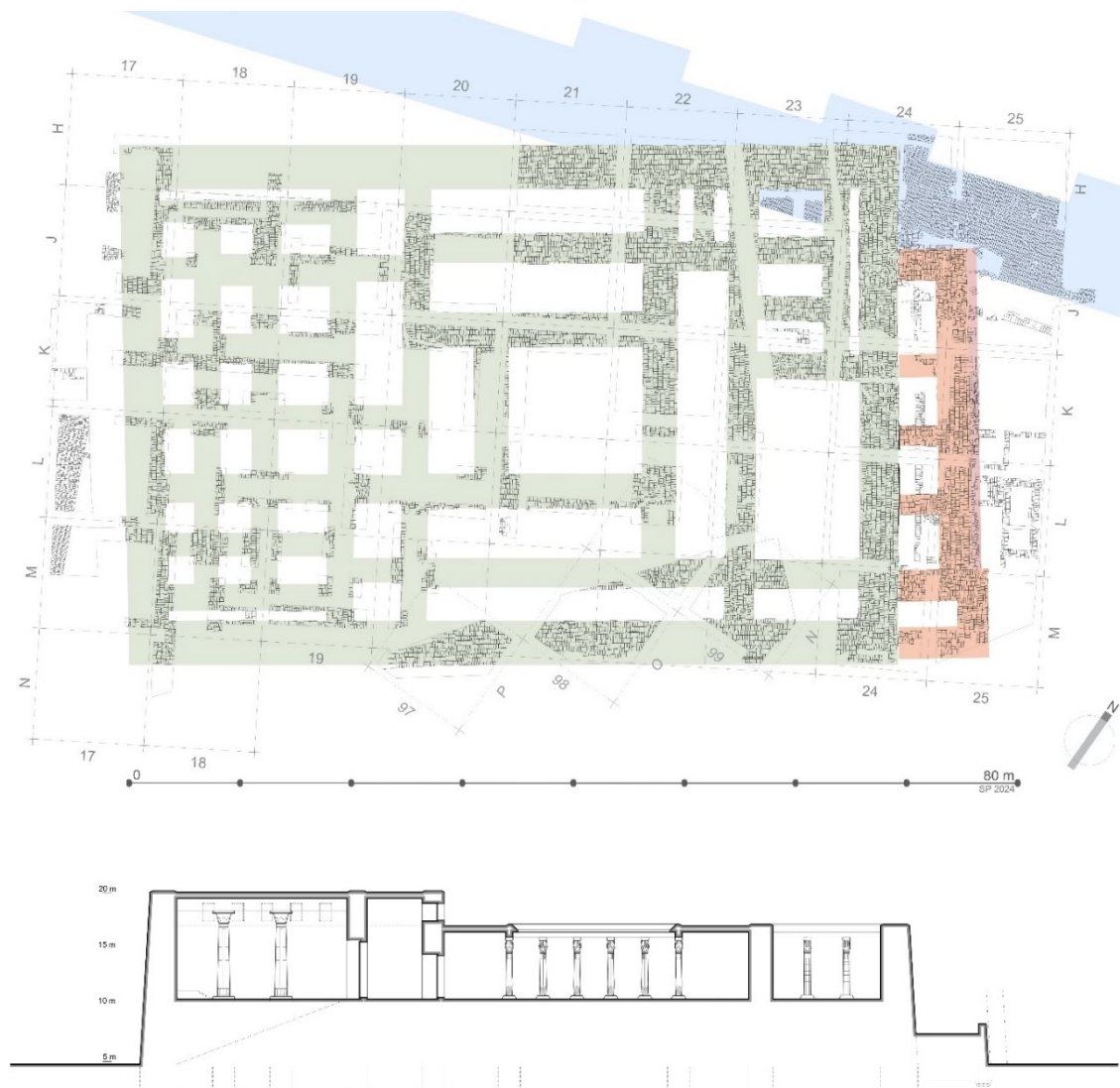


Fig. 6 Reconstruction of the spatial layout of Palace F and of the functional use of its internal circulation routes.

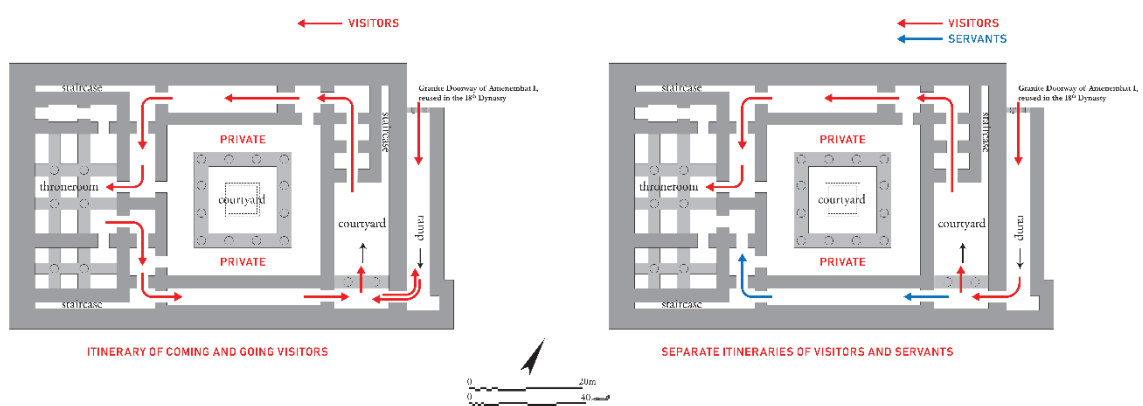
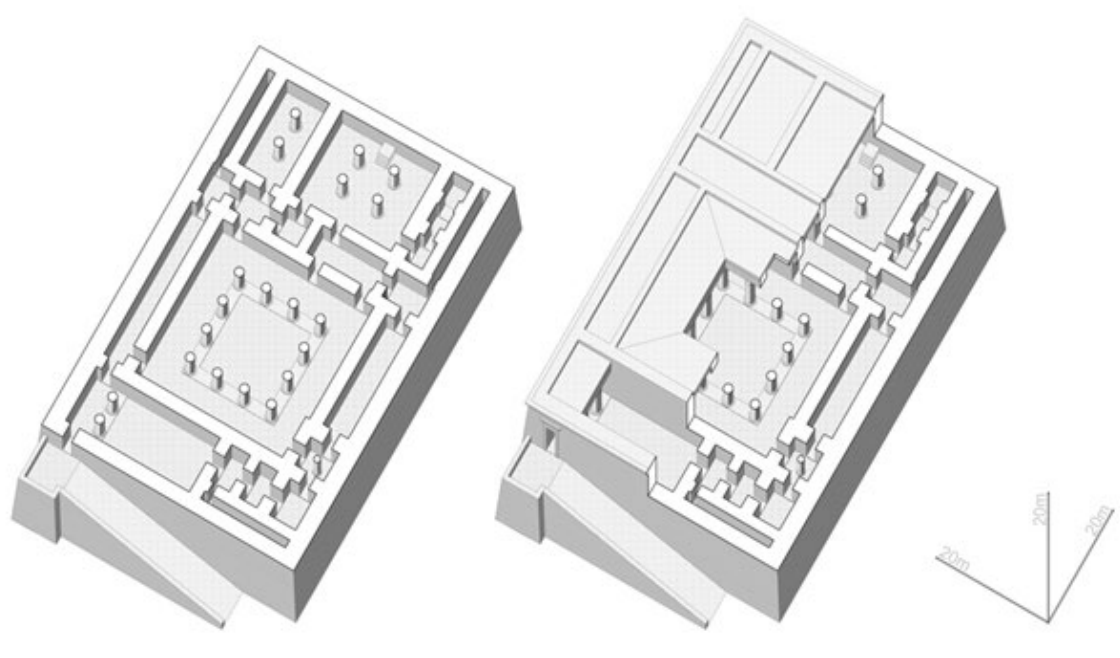


Fig. 7 Study of the itinerary within Palace F by application of architectural semiotics.



*Fig. 8 Proposed solutions for reconstructing the cloister of the central court with columns or pillars (S. Poptawski).*



*Fig. 9 Reconstruction concepts for Palace F, illustrating the design alternatives for courtyard columns and pillars (S. Poptawski).*

### **Aegean Frescoes**

Following the initial studies of the frescoes,<sup>38</sup> J. BECKER published reconstructions and details of the Aegean frescoes from Palace F.<sup>39</sup> In addition, he enhanced several fresco fragments required by L. Morgan for the reconstruction of the hunting frieze. Part of this work was completed in 2024 by M. Negrete Martinez.

The analysis by J. JUNGFLAISCH of the stucco fragments from ceilings and walls, aimed at reconstructing the architectural settings they represented, will be published shortly.<sup>40</sup>

As the frescoes were found in dump heaps outside the palace, the question of whether they can be digitally relocated to their original positions requires close scrutiny, taking into account comparisons with the frescoes at the Palace of Knossos.

<sup>38</sup> See especially i.a., BIETAK, MARINATOS & PALLYVOU 2007; MARINATOS 2000; 2010; MARINATOS & MORGAN 2005; MORGAN 2010a; 2010b; 2018.

<sup>39</sup> BECKER 2024.

<sup>40</sup> JUNGFLAISCH 2025.



The style, the presence of Knossian symbols, and the occurrence of the maze pattern all offer promising avenues for reconstruction. It appears logical that the life-sized figures of griffins and panthers would have been placed in antithetic pairs on either side of the assumed position of the throne, at the centre of the back wall of Palace F's throne room.

A bent-axis approach towards the throne, as seen in Knossos, can be ruled out due to the architectural layout of the room, which shows an increased width in the first transverse aisle. This configuration would have allowed a larger assembly of people before admission to the throne, a layout that only makes sense if a straight axis through the throne room is assumed.

The position of the Taureador frescoes, the hunting frieze, and the large figures published by J. Jungfleisch require further investigation. L. Morgan is currently engaged in a detailed study of the hunting friezes.

It is also highly probable that the fragments of a painted floor, featuring an elaborate oblique reed mat motif, originate from the throne room.

### **Palace G Architecture**

Palace G is the largest of the three structures, and its stratigraphy includes several additional features: Phases D/2–3 (middle to late Hyksos Period), D/1.2, D/1.1 (early 18<sup>th</sup> Dynasty), C/3–2 (the palatial precinct of the mid-18<sup>th</sup> Dynasty), C/1 (a fortress from the late 18<sup>th</sup> Dynasty), and B (walls from the 19<sup>th</sup>–20<sup>th</sup> Dynasties).

The spatial layout of Palace G and the smaller Palace J has been largely clarified through comparison with other Egyptian palaces. Among those constructed atop platforms, the only direct parallel is the Northern Palace at Deir el-Ballas. There is also reason to suspect foreign influence, given the similar constructions found in fortresses at Ebla and Gezer, and the substructure of the palace at Qatna.

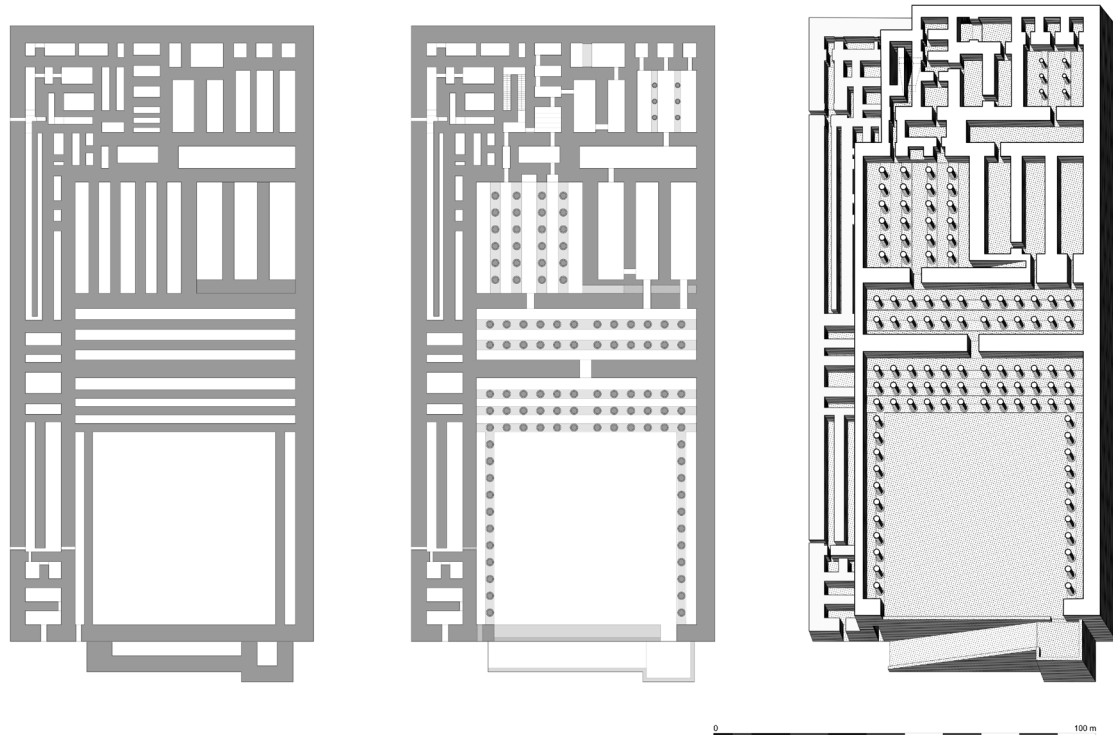
The height of the platform in our case could be calculated from the length and gradient of the ramps, producing results in straight Egyptian cubit measures: 14 cubits (0.525 m per cubit) for both Palaces G and F. The platform of Palace G, measuring 305 x 150 Egyptian cubits, consisted of a gridwork of casemate walls solidly filled with soil and rubble. This structure revealed the space allocation plan of the upper level. Only a 33 cubit wide stripe along the eastern edge of the platform appears to have been used for storerooms and possibly offices at ground level. The function of this eastern substructure in the upper storey remains unclear. However, for the majority of the palace, a plausible reconstruction is possible through comparison with other palatial layouts in Egypt.

The ramp led to a large square courtyard measuring 90 x 90 cubits, flanked on both sides by colonnades. These could be traced by their foundation walls, which were 5 to 5.5 bricks thick and thinner than the rising walls, and by their position in places where colonnades would be expected.

Beyond a three-aisled portico, one entered a vestibule extending the full breadth of the palace. Surprisingly, behind this space, the width of the palace was divided between a throne-room on the left and a temple-like structure on the right. This arrangement is unique given that, in Egyptian architecture, the right side typically



holds higher hierarchical significance, while the left side is considered inferior.<sup>41</sup> However, this distribution becomes comprehensible within a religious hierarchy: the right side belongs to the god, the left to the king. Indeed, New Kingdom temple-palaces are consistently situated on the left side of the temple axis.



*Fig. 10 Plan of the substructure of Palace G (left) and a reconstruction of its rising walls (centre and right). The corridor/stairway to the right of the five aisled throne room was discovered by the geomagnetic survey, created by the different properties of the brick walls by the weight of the upgoing walls versus the empty space of the corridor (M. Bietak & S. Popławski).*

The square throne-room is the largest yet found in Egypt, measuring 55 x 55 cubits. The foundation walls show four rows of columns, for which we find good parallels in Egyptian palatial architecture—most notably in the Northern Palace at Deir el-Ballas (17<sup>th</sup>/early 18<sup>th</sup> Dynasty) and the so-called Southern Harim at Tell el-‘Amarna. Other parallels include the anteroom to the throne rooms found in the temple-palaces of Seti I, the Ramesseum, and the earlier phase of the temple-palace of Ramesses III at Medinet Habu.

To the right of the throne room, walls were uncovered that follow the layout of a typical Tuthmosid temple. This marks the first known instance of a temple being integrated within a palace in Egypt—suggesting Near Eastern influence, where such architectural combinations are common (see above). A staircase embedded in a very thick front wall, serving as a pylon, was also discovered through geomagnetic survey.

The final section at the rear of the palace could be interpreted as comprising two private apartments, which were also accessible through a side door and staircase located on the south-eastern side of the building. The temple follows the typical plan of a Tuthmosid temple, with a tripartite front section and an obliquely

<sup>41</sup> Bietak 2005, 165–167.

aligned hidden sanctuary at the rear. It is significantly larger than comparable Tuthmosid examples at Wadi Halfa, Elephantine, and western Thebes.

The combined scale of the palatial precinct and its enclosed temple, together with the large, adjacent harbour basin, provides strong evidence that this was the king's residence at the royal port of Peru-nefer<sup>39</sup>—the principal military harbour of Tuthmosis III and Amenophis II. The large temple within the palace may have served as the shrine of “Amun of Peru-nefer”, known from a representation on a dislocated block at Bubastis and referenced in Papyrus Sallier IV.

Semiotic studies revealed that bathrooms were installed both at the beginning of the access ramp and at the eastern side entrance of the palace—possibly indicating that individuals were obliged to perform ablutions before entry. The eastern side door was also accessible from a large building situated east of the palace, which we interpret as an administrative complex whose chief may have had direct access to the king's private rooms.

#### **IV. PUBLICATIONS**

##### **Published Monographs:**

MIRIAM MÜLLER, *Tell el-Dab'a XIV.2, Das Stadtviertel F/I in Tell el-Dab'a/Avaris – Multikulturelles Leben in einer Stadt des späten Mittleren Reiches und der Zweiten Zwischenzeit*, UZK XLI, Vienna 2023: Publishing House of the Austrian Academy, pp. 560, figs. 94, pls. 27, plans 7. (This publication was produced under the guidance of the PI, but outside the FWF project).

JOHANNES BECKER, *Ägäische Wandmalereien aus dem Tuthmosidenpalast von Tell el-Dab'a I: Die großformatigen Greifen- und Landschaftsdarstellungen. Technik, Ikonographie und Rekonstruktion der Kalkputzmalereien im überregionalen Vergleich*, Contributions to the Archaeology of Egypt, Nubia and the Levant 18.1, Wiesbaden 2024: Harrassowitz, pp. 429, figs. 312.

JOHANNES JUNGFLISCH, *Ägäische Wandmalereien aus dem Tuthmosidenpalast von Tell el-Dab'a II: Architektonische Impressionen aus Tell el-Dab'a/Avaris: Zur Produktion und Rezeption der architekturensimulierenden Wandmalereien ägäischen Designs aus 'Palast G' im Kontext Ägyptens*, vols. I–II, Contributions to the Archaeology of Egypt, Nubia and the Levant 18.2, Wiesbaden 2025: Harrassowitz, pp. 783, figs. 137, pls. 100.

##### **Finished Manuscripts of Monographs:**

DAVID A. ASTON, *Tell el-Dab'a XXVI, The Palace Area: From the Hyksos to Horemheb. The Pottery from Palace-Area H/VI*, With an environmental and chronological introduction by Manfred Bietak and contributions by Bettina Bader, Marta Luciani and Mary Ownby, vols. I–II, in: M. Bietak (ed.), *Excavations at Tell el-Dab'a*, UZK LIV, Vienna: Publishing House of Austrian Academy, pp. 542, figs. 366, pls. 662.

PERLA FUSCALDO, *Tell el-Dab'a XXVII, The Palace Area: The Pottery Assemblages of some Loci from 'Ezbet Helmi (Areas H/III And H/VI) from Phases E/1–D/3 to C/3–C/2*, Excavations at Tell el-Dab'a, UZK LVI, Vienna 2026/2027: Publishing House of the Austrian Academy.

##### **Published Articles:**

MANFRED BIETAK, Why did the Relationship between Egypt and the Minoan World Reach its Zenith in the Era of Hatshepsut and Tuthmosis III?, in: N. MARINATOS, F. BLAKOLMER & L. PLATON (eds.), *Pax Minoica Revisited: New Research on Arthur Evans' Concept of the Political Expansion of Minoan Crete*,

Contributions to the Archaeology of Egypt, Nubia and the Levant 19, Wiesbaden 2025: Harrassowitz, 213–251.

MANFRED BIETAK & Team, “Forschungen zu Ägypten/Research on Egypt” in: *ÖAI Jahresbericht 2024/OeAI Annual Report*, Vienna 128–134.

## **V. DATA MANAGEMENT**

As some of the data used by the project are already stored in the repository of the Austrian Academy of Sciences (<https://4dpuzzle.oeaw.ac.at/>), the newly generated data will also be stored there, but will be mirrored to the repository of TU Vienna. The digitized data comprises field plans, field section drawings and field protocols of the areas in question. The newly produced digital plans and 3D models using AutoCAD will be included into this repository.

Data will be organised in the standardised folder structure and naming conventions as defined by the default template of the repository of the “A Puzzle in 4D – Tell el-Daba”-Project, also the files will be named according to the already existing metadata standards. The data will be organised in plana, composite plans, drawings of details, of sections, photographs, finds and protocols. Base material description and provenance is compiled in lists and will be introduced as metadata into the data repository of the Austrian Academy of Sciences and the TU Vienna.

Files are stored in open, standardised formats as far as possible. The formats PDF/A, CSV and TIFF are used for this purpose. Where conversion to an open format is not possible, original formats are saved.

## **VI. BIBLIOGRAPHY**

CAENL = Series: Contributions to the Archaeology of Egypt, Nubia and Levant

E&L = Journal: *Ägypten und Levante/Egypt and the Levant*, Vienna.

OLA = Series: *Orientalia Lovaniensia Analecta*, Leuven.

UZK = Series: *Untersuchungen der Zweigstelle Kairo des Österreichischen Archäologischen Institutes*, Vienna.

ALTENMÜLLER, H. 2015. *Zwei Annalenfragmente aus dem frühen Mittleren Reich*, Hamburg.

ALTENMÜLLER, H. & MOUSSA, A.M. 1991. Die Inschrift Amenemhets II. aus dem Ptah-Tempel von Memphis. Vorbericht, *Studien zur altägyptischen Kultur* 18, 1–48.

ASTON, D.A., BADER, B. & KUNST, G.-K. 2009. Fishes, Ringstands, Nudes and Hippos – A Preliminary Report on the Hyksos Palace Pit Complex L81, *E&L* 19, 19–90.

BECKER, J., JUNGLEISCH, J. & VON RÜDEN, C. 2012/2013. From Small Fragments to Large Animals. A Large-Scale Animal Fight in ‘Palace F’ at Tell el-Dab’a, *E&L* 22/23, 149–166.

BECKER, J. 2024. *Ägäische Wandmalereien aus dem Tuthmosidenpalast von Tell el-Dab’a I: Die großformatigen Greifen- und Landschaftsdarstellungen. Technik, Ikonographie und Rekonstruktion der Kalkputzmalereien im überregionalen Vergleich*, CAENL 18.1, Wiesbaden.

BIETAK, M. 1975. *Tell el-Dab’a II, Der Fundort im Rahmen einer archäologisch-geographischen Untersuchung über das ägyptische Ostdelta*, UZK I, Vienna.

BIETAK, M. 1976. Stratigraphische Probleme bei Tellgrabungen im Vorderen Orient, in: H. Friesinger, H. Kerchler & H. Mitscha-Märheim (eds.), *FS Richard Pittioni*, *Archaeologia Austriaca Beiheft* 14, Vienna, 471–493. (It is intended to revise this article as a contribution in the forthcoming volume *Tell el-Dab’a IV.1*)

BIETAK, M. 1981. Avaris and Piramesse. Archaeological Exploration in the Eastern Nile Delta. Mortimer Wheeler Archaeological Lecture 1979, *Proceedings of the British Academy London* 65/1979, 225–290 (2. erweiterte Auflage Oxford 1986).

- BIETAK, M. 1984. Eine Palastanlage aus der Zeit des späten Mittleren Reiches und andere Forschungsergebnisse aus dem östlichen Nildelta (Tell el-Dab'a 1979–1984), *Anzeiger der Österreichischen Akademie d. Wiss., phil.-hist. Kl.* 121, 312–349.
- BIETAK, M. 1996a. *Avaris. The Capital of the Hyksos. Recent Excavations at Tell el-Dab'a*, London.
- BIETAK, M. 1996b. Zum Raumprogramm ägyptischer Wohnhäuser des Mittleren und des Neuen Reiches, in: M. Bietak (ed.), *Haus und Palast im alten Ägypten*, UZK XIV, Vienna, 23–43.
- BIETAK, M. 1997. The Center of Hyksos Rule. Avaris (Tell el-Dab'a), in: E.D. Oren (ed.), *The Hyksos. New Historical and Archaeological Perspectives*, University Museum Monograph 96, Philadelphia, 87–139.
- BIETAK, M. 2005. Neue Paläste aus der 18. Dynastie, in: P. Jánosi (ed.), *Structure and Significance, Thoughts on Ancient Egyptian Architecture* (Festschrift for Dieter Arnold), UZK XXV, Vienna, 131–168.
- BIETAK, M. 2010a. A Palace of the Hyksos Khayan at Avaris, in: P. Matthiae et al. (eds.), *Proceedings of the 6<sup>th</sup> International Congress of the Archaeology of the Ancient Near East, 5 May–10 May 2009, "Sapienza", Università di Roma*, vol. II, Wiesbaden, 99–109.
- BIETAK, M. 2010b. Le hyksôs Khayan, son palais, et une lettre en cunéiforme, *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres* 154, 973–990.
- BIETAK, M. 2010c. From where came the Hyksos and where did they go, in: M. Marée (ed.), *The Second Intermediate Period (Thirteenth–Seventeenth Dynasties): Current Research, Future Prospects*, OLA 192, Leuven, 139–181.
- BIETAK, M. 2010d. Minoan Presence in the Pharaonic Naval Base of Peru-nefer, in: O. Krzyszkowska (ed.), *Cretan Offerings. Studies in Honour of Peter Warren*, British School at Athens Studies 18, London, 11–24.
- BIETAK, M. 2011. A Hyksos Palace at Avaris, *Egyptian Archaeology* 38, 38–41.
- BIETAK, M. 2017. Harbours and Coastal Military Bases in Egypt in the Second Millennium B.C. Avaris, Peru-nefer, Pi-Ramesse, in: H. Willems & J.-M. Dahms (eds.), *The Nile. Natural and Cultural Landscape in Egypt*, Historical Cultural Sciences 36, Bielefeld, 53–70.
- BIETAK, M. 2018a. A Thutmosid Palace Precinct at Peru-Nefer/Tell El-Dab'a, in: M. Bietak & S. Prell (eds.), *Palaces in Ancient Egypt and the Ancient Near East*, vol. I, CAENL 5, Vienna, 231–257.
- BIETAK, M. 2018b. The Giparu of Ur as a Paradigm for Gender-Related Temple Types in the Ancient Near East, *Eretz Israel* 33, The Lawrence E. Stager Volume, Jerusalem 2018, 9\*-24\*.
- BIETAK, M. 2022a. König Neḥesi in Avaris/Tell el-Dab'a als levantinischer König und die Plünderung der memphitischen Elite-Nekropolen in der Zeit der 14. Dynastie, in: R. Bussmann et al. (eds.), *Spuren der altägyptischen Gesellschaft. Festschrift für Stephan Seidlmayer zu seinem 65. Geburtstag*, Zeitschrift für ägyptische Sprach und Altertumskunde Beiheft 14, Berlin, 233–277.
- BIETAK, M. 2022b. Avaris/Tell el-Dab'a, Revised Article, in: A. Erskine, D.B. Hollander & A. Papaconstantinou (eds.), *The Encyclopedia of Ancient History* (29 June 2022). <doi:10.1002/9781444338386.wbeah15052.pub2>.
- BIETAK, M. 2025. Why did the Relationship between Egypt and the Minoan World Reach its Zenith in the Era of Hatshepsut and Tuthmosis III?, in: N. Marinatos, F. Blakolmer & L. Platon (eds.), *Pax Minoica Revisited: New Research on Arthur Evan's Concept of the Political Expansion of Minoan Crete*, CAENL 19, Wiesbaden, 213–251.
- BIETAK, M. & BADER, B. 2015. The Freedom of Fringe Art: À propos the Fish Bowls in the Second Intermediate Period, in: O. Goelet & A. Oppenheim (eds.), *The Art and Culture of Ancient Egypt: Studies in Honor of Dorothea Arnold*, Bulletin of the Egyptological Seminar 19, 157–178.
- BIETAK, M., EIGNER, D. & MARTIN, M. In preparation. *Tell el-Dab'a XIV.1, A Palatial Mansion of the 13<sup>th</sup> Dynasty*, Vienna.
- BIETAK, M. & FORSTNER-MÜLLER, I. 2005. Ausgrabung eines Palastbezirkes der Tuthmosidenzeit bei 'Ezbet Helmi/Tell el-Dab'a, Vorbericht für Herbst 2004 und Frühjahr 2005, *E&L* 15, 65–100.
- BIETAK, M. & FORSTNER-MÜLLER, I. 2006. Eine palatiale Anlage der frühen Hyksoszeit (Areal F/II). Vorläufige Ergebnisse der Grabungskampagne 2006 in Tell el-Dab'a, *E&L* 16, 63–78.
- BIETAK, M. & FORSTNER-MÜLLER, I. 2007. Ausgrabung eines Palastbezirkes der Tuthmosidenzeit bei 'Ezbet Helmi/Tell el-Dab'a, Vorbericht für das Frühjahr 2007, *E&L* 17, 35–58.
- BIETAK, M. & FORSTNER-MÜLLER, I. 2009. mit einem Beitrag von F. van Koppen und K. Radner, Der Hyksos-Palast bei Tell el-Dab'a. Zweite und dritte Grabungskampagne (Frühling 2008 und Frühling 2009), *E&L* 19, 91–119.
- BIETAK, M., MATH, N. & MÜLLER, V. 2012/2013. Report on the Excavations of a Hyksos Palace at Tell el-Dab'a/Avaris (23<sup>rd</sup> August–15<sup>th</sup> November 2011) with a contribution by C. Jurman, *E&L* 22/23, 17–53.
- BIETAK, M., MARINATOS, N. & PALYVOU, C. 2007. *Taureador Scenes in Tell el-Dab'a (Avaris) and Knossos*, Vienna.
- BIETAK, M. & PRELL, S. forthcoming. *Tell el-Dab'a IV.1: Komplexe Stratigraphien: Die 400 Jahre des Tempelbezirks des Seth-Ba'al in Avaris/Piramesse*, Ausgrabungen in Tell el-Dab'a, UZK. Vienna

- BORCHARDT, L. 1907/1908. Die Darstellung des Dienstgebäudes des Auswärtigen Amtes unter den Ramessiden, *Zeitschrift für ägyptische Sprache und Altertumskunde* 44, 59–61.
- BORCHARDT, L. & RICKE, H. *Die Wohnhäuser in Tell el-Amarna*, Berlin 1980.
- COLLOMBERT, PH. & COULON, L. 2000. Les dieux contre la mer, le début du papyrus d'Astarte (pBN 202), *Bulletin de l'Institut français d'archéologie orientale* 100, 193–242.
- CZERNY, E. 1999. *Tell el-Dab'a IX, Eine Plansiedlung des frühen Mittleren Reiches*, UZK XV, Vienna.
- CZERNY, E. 2015. *Tell el-Dab'a XXII, "Der Mund der beiden Wege". Die Siedlung und der Tempelbezirk des Mittleren Reiches von Ezbet Ruschdi*, UZK XXXVIII, Vienna.
- DORNER, J. 1999. Die Topographie von Piramesse – Vorbericht, *E&L* 9, 77–83.
- DOTHAN, M. 1956. The Excavations at Nahariya: Preliminary Report (Seasons 1954/55), *Israel Exploration Journal* 6, 14–25.
- DOTHAN, M. 1957. The Bema at Nahariyya, *Eretz-Israel* 4, 41–46 (Hebrew).
- DUHOUX, Y. 2003. *Des Minoens en Égypte? "Keftiou" et "les îles au milieu du Grand Vert"*, Louvain la-Neuve.
- ECO, U. 1980. Function and Sign: The Semiotics of Architecture, in: C. Jencks, R. Bunt & G. Broadbent (eds.) *Signs, Symbols and Architecture*, New York, 11–69.
- ECO, U. 1988. *Einführung in die Semiotik*, Munich.
- EIGNER, D. 1985. Der ägyptische Palast eines asiatischen Königs, *Jahreshefte des Österreichischen Archäologischen Institutes* 56, 19–25.
- FRANKFORT, H., LLOYD, S. & JACOBSEN, T. 1940. *The Gimilsin Temple and the Palace of the Rulers at Tell Asmar*, Oriental Institute Publications 43, Chicago.
- FUSCALDO, P. 2000. *Tell el-Dab'a X.1, The Palace District of Avaris. The Pottery of the Hyksos Period and the New Kingdom (Areas H/III and H/VI), Part 1: Locus 66*, UZK XVI, Vienna.
- FUSCALDO, P. 2010. *Tell el-Dab'a X.2. The Palace District of Avaris. The Pottery of the Hyksos Period and the New Kingdom (Areas H/III and H/VI), Part 2: Two Execration Pits and a Foundation Deposit*, UZK XXXVI, Vienna.
- GOEDICKE, H. 1966. Some Remarks on the 400-Year-stela, *Chronique d'Égypte* 41 (81), 23–39.
- GOEDICKE, H. 1981. The "400-Year Stela" Reconsidered, *Bulletin of the Egyptological Seminar* 3, 25–42.
- GOLDWASSER, O. 2012/2013. Out of the Mists of the Alphabet – Redrawing the 'Brother of the Ruler of Retenu', *E&L* 22, 353–374.
- GRESKY, J., BIETAK, M., PETITI, E., SCHEFFLER, C. & SCHULTZ, M. 2023. First Bioarchaeological Evidence of Severed Hands in Egypt, *Nature/Scientific Reports* 13, 5239 <<https://doi.org/10.1038/s41598-023-32165-8>>.
- GUNDACKER, R. 2017. Papyrus British Museum 10056. Ergebnisse einer Neukollationierung und Anmerkungen zur inhaltlichen Auswertung im Rahmen der militärischen Ausbildung Amenophis' II., *E&L* 27, 281–334.
- HABACHI, L. 1954. Khatâ'na-Qantîr. Importance, *Annales du Service des Antiquités de l'Égypte* 52, 443–559.
- HABACHI, L. 2001. *Tell el-Dab'a I, Tell el-Dab'a and Qantir. The Site and its Connection with Avaris and Piramesse*. E.-M. Engel et al. (ed.), UZK II, Vienna.
- HEIN, I. 1994. Kat. Nr. 314, in: *Pharaonen und Fremde, Dynastien im Dunkel*, (Exhibition catalogue), Vienna.
- HEINRICH, E. 1982. *Die Tempel und Heiligtümer im Alten Mesopotamien, Typologie, Morphologie und Geschichte*, Denkmäler antiker Architektur 14, Berlin.
- HEINRICH, E. 1984. *Die Paläste im alten Mesopotamien*, Denkmäler antiker Architektur 15, Berlin.
- JÁNOSI, P. 1994. IV. Tell el-Dab'a – 'Ezbet Helmi. Vorbericht über den Grabungsplatz H/I (1989–1992), *E&L* 4, 20–38.
- JUNGFLEISCH, J. 2025. *Ägäische Wandmalereien aus dem Tuthmosidenpalast von Tell el-Dab'a II: Architektonische Impressionen aus Tell el-Dab'a/Avaris. Zur Produktion und Rezeption der architekturensimulierenden Wandmalereien ägäischen Designs aus ,Palast G' im Kontext Ägyptens*, CAENL 18.2, Wiesbaden.
- KEES, H. 1962. Ein Handelsplatz des MR im Nordostdelta, *Mitteilungen des Deutschen Archäologischen Instituts Kairo* 18, 1–13.
- KEMP, B.J. & GARFI, S. 1993. *A Survey of the Ancient City of el-'Amarna*, London.
- KOPETZKY, K. & BIETAK, M. 2016. A Seal Impression of the Green Jasper Workshop from Tell el-Dab'a, *E&L* 26, 357–375.
- KOVAKS, K. 2018. The Metaphor of Architecture, in: *Confluente arhitecturale*, Bukarest, 163–174.
- MARCHETTI, N. 2006. Middle Bronze Age Public Architecture at Tilmen Höyük and the Architectural Tradition of Old Syrian Palaces, in: F. Baffi, R. Dolce, S. Mazzoni & F. Pinnock (eds.), *Ina kibrât erbetti: studi di archeologia orientale dedicati a Paolo Matthiae*, Rome, 275–308.
- MARCHETTI, N. 2016. The Cultic District of Karkemish in the Lower Town, in: Matthiae & M. D'Andrea (eds.), *L'archeologia del sacro e l'archeologia del culto. Sabratha, Ebla, Ardea, Lanuvio. Ebla e la Siria dall'età del bronzo all'età del ferro*, Atti dei Convegni Lincei 304, Rome, 373–414.

- MARCUS, E. 2007. Amenemhet II and the Sea: Maritime Aspects of the Mit Rahina (Memphis) Inscription, *E&L* 17, 137–190.
- MARGUERON, J.-C. 1982. *Recherches sur les palais mésopotamiens de l'âge du bronze I–II*, Bibliothèque archéologique et historique 107, Paris.
- MARGUERON, J.-C. 2004. *Mari: Métropole de l'Euphrate au IIIe et au début du IIe millénaire av. J.-C.*, Paris.
- MARGUERON, J.-C. 2014. *Mari: Capital of Northern Mesopotamia in the Third Millennium BC: The Archaeology of Tell Hariri on the Euphrates*, Oxford.
- MARINATOS, N. 2000. A Hunting Scene from Tell el Dab'a. Hunting in a Pink Landscape, in: A. Καρέτσου (ed.) *Πεπραγμένα Η' Διεθνούς Κρητολογικού Συνεδρίου, Ηράκλειο, 9–14 Σεπτεμβρίου*, vol. A2, Heraklion, 259–265.
- MARINATOS, N. 2010. Lions from Tell el-Dab'a, *E&L* 20, 325–355.
- MARINATOS, N. & MORGAN, L. 2005. The Dog Pursuit Scenes from Tell el-Dab'a and Kea, in: L. Morgan (ed.), *Aegean Wall Painting. A Tribute to Mark Cameron*, British School at Athens Studies 13, London, 119–122.
- MATTHÄUS, H. 1995. Representations of Keftiu in Egyptian Tombs and the Absolute Chronology of the Aegean Late Bronze Age, *Bulletin of the Institute of Classical Studies* 40, 177–194.
- MATTHIAE, P. 2002. Fouilles et restaurations à Ebla en 200–2001: le palais occidental, la résidence occidentale et l'urbanisme de la ville paléosyrienne, *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres* 146, 531–574.
- MATTHIAE, P. 2010. *Ebla, la città del trono*, *Archeologia e storica*, Turin.
- MONTET, P. 1931–1933. La stèle de l'an 400 retrouvée, *Kêmi* 4, 191–215.
- MORGAN, L. 2004. Feline Hunters in the Tell el-Dab'a Paintings. Iconography and Dating, *E&L* 14, 285–298.
- MORGAN, L. 2006. Art and International Relations. The Hunt Frieze at Tell el-Dab'a, in: E. Czerny et al. (eds.), *Timelines. Studies in Honour of Manfred Bietak*, vol. II, OLA 149, Leuven, 249–258.
- MORGAN, L. 2010a. A Pride of Leopards. A Unique Aspect of the Hunt Frieze from Tell el-Dab'a, *E&L* 20, 263–301.
- MORGAN, L. 2010b. An Aegean Griffin in Egypt. The Hunt Frieze at Tell el-Dab'a, *E&L* 20, 303–323.
- MORGAN, L. 2018. Forming the Image. Approaches to Painting at Ayia Irini, Kea and Tell el-Dab'a, in: Becker et al. (eds.), *Tracing Technoscapes: The Production of Bronze Age Wall Paintings in the East Mediterranean*, Leiden, 235–251.
- MÜLLER, M. 2015. Late Middle Kingdom Society in a Neighborhood of Tell el-Dab'a/Avaris, in: M. Müller (ed.), *Household Studies in Complex Societies, (Micro)Archaeological and Textual Approaches*, Oriental Institute Seminars 10, Chicago, Ill., 339–370.
- MÜLLER, M. 2023. *Tell el-Dab'a XIV.2, Das Stadtviertel F/I in Tell el-Dab'a/Avaris – multikulturelles Leben in einer Stadt des späten Mittleren Reiches und der Zweiten Zwischenzeit*, UZK XLI, Vienna.
- NOVÁK, M. & PFÄLZNER, P. 2002. Ausgrabungen in Tall Mišrife-Qatna 2001. Vorbericht der deutschen Komponente des internationalen Kooperationsprojektes, *Mitteilungen der Deutschen Orientgesellschaft* 134, 207–246.
- OATES, D. OATES J. & MACDONALD. H. 1997. *The Excavations at Tell Brak 1: The Mitanni and Old Babylonian Periods*, McDonald Institute Monographs, Cambridge.
- PANAGIOTOPOULOS, D. 2001. Keftiu in Context. Theban Tomb-paintings as a Historical Source, *Oxford Journal of Archaeology* 20, 263–283.
- PANAGIOTOPOULOS, D. 2006. Foreigners in Egypt in the Time of Hatshepsut and Thutmose III, in: E.H. Cline & D. O'Connor (eds.), *Thutmose III. A New Biography*, Ann Arbor, 370–412.
- PARROT, A. 1958. *Le Palais, Architecture*, Mission Archéologique de Mari II, Paris.
- PEDDE, F. & LUNDSTRÖM, S. 2008. *Der alte Palast in Assur: Architektur und Baugeschichte*, Wissenschaftliche Veröffentlichungen der Deutschen Orient-Gesellschaft 120, Wiesbaden.
- PETRIE, W.M.F. 1894. *Tell el Amarna*, London.
- PFÄLZNER, P. 2007. Archaeological Investigations in the Royal Palace at Qatna, in: D. MORANDI BONACOSI (ed.), *Urban and Natural Landscapes of an Ancient Syrian Capital. Settlement and Environment at Tell Mišrifeh/Qatna and in Central-Western Syria. Proceedings of a Conference held in Udine 9–11 December 2004*, Studi Archeologici su Qantna 1, Udine, 29–64.
- PFÄLZNER, P. 2019. The Modularisation of Palatial Architecture in 2<sup>nd</sup> Millennium BC Syria, in: M. Bietak, P. Matthiae & S. Prell (eds.), *Palaces in Ancient Egypt and the Ancient Near East*, vol. II, CAENL 8, Wiesbaden, 117–142.
- POSCH, J. 2019. *Die Gärten von Avaris*, unpublished Master Thesis, University of Vienna.
- PRAK, N.L. 1968. *The Language of Architecture: A Contribution to Architectural Theory*, The Hague.
- SALONEN, A. 1965. *Die Hausgeräte der alten Mesopotamier nach sumerisch-akkadischen Quellen*, Helsinki.
- SCHIESTL, R. 2006. The Statue of an Asiatic Man from Tell el-Dab'a, Egypt, *E&L* 16, 173–185.

- SCHIESTL, R. 2009. *Tell el-Dab'a XVIII, Die Palastnekropole von Tell el-Dab'a. Die Gräber des Areals F/I der Straten d/2 und d/1*, UZK XXX, Vienna.
- SETERS, J. van. 1966. *The Hyksos. A New Investigation*, New Haven & London.
- SETHE, K. 1930. Der Denkstein mit dem Datum des Jahres 400 der Ära von Tanis, *Zeitschrift für Ägyptische Sprache und Altertumskunde* 65, 85–89.
- SPENCE, K. 2009. The Palaces of el-Amarna: Towards and Architectra Analysis, in: R. Gundlach & J.H. Taylor eds.), *4<sup>th</sup> Symposium zur ägyptischen Königsideologie/4<sup>th</sup> Symposium on Egyptian Royal Residences*, London, 165–187.
- STADELMANN, R. 1965. Die 400-Jahr Stele, *Chronique d'Égypte* 40, 46–60.
- VERCOUTTER, J.-L. 1956. Les étrangers de la tombe d'Ouseramon à Thèbes, in: D. Sinor (ed.), *Proceedings of the Twenty-third International Congress of Orientalists, Cambridge 21<sup>st</sup>–28<sup>th</sup> August, 1954*, London, 68.
- TRIGGER, B. 1990. *Monumental Architecture: A Thermodynamic Explanation of Symbolic Behaviour*, *World Archaeology* 22.2, 119–132.
- VON BECKERATH, J. 1993. Nochmals die Vierhundertjahr-Stele, *Orientalia* 62, 400–403.
- WACHSMANN, S. 1987. *Aegeans in the Theban Tombs*, OLA 20, Leuven.
- WOOLLEY, C.L. 1952. *Carchemish. Report on the Excavations at Jerablus on behalf of the British Museum Conducted by D.G. Hogarth et al, III. The Excavations in the Inner Town*, London.
- WOOLLEY, C.L. 1955. *Alalakh. An Account of the Excavations at Tell Atchana in the Hatay, 1937–1949*, Report of the Research Committee 18, London.