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# The emergence of mudbrick architecture in Egypt in the 4th millennium BCE. Reflection based on recent discoveries at Tell el-Iswid (Eastern Delta)

Nathalie Buchez, Julie Gerez, Samuel Guérin, Mathilde Minotti

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*par Julie Villaeys*

# The emergence of mudbrick architecture in Egypt in the 4th millennium BCE. Reflection based on recent discoveries at Tell el-Iswid (Eastern Delta)<sup>1</sup>

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*Antérieurement à la seconde moitié du IV<sup>e</sup> millénaire avant notre ère, une architecture légère prédomine en Égypte. De récentes découvertes dont celles issues des recherches des auteurs sur le site de Tell el-Iswid, dans le Delta oriental, viennent étoffer de façon substantielle le dossier de la genèse de l'architecture de brique crue égyptienne et, pour certaines, remettre en question ou moduler l'hypothèse première d'un processus de diffusion à partir des régions proche-orientales où plusieurs foyers concentrent les plus vieux exemples de l'utilisation de la brique crue. Un tour d'horizon de l'ensemble de la documentation sur le sujet conduit à une réflexion sur les conditions et modalités d'émergence de l'architecture de brique crue en Égypte.*

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1. This article is largely based, apart from some new developments, on a French version presented at the colloquium "Architecture et construction en terre crue. Approches historiques, sociologiques, économiques – Échanges transdisciplinaires sur les constructions en terre-crue, 5<sup>e</sup> Table-ronde internationale, Montpellier octobre 2019", cf. Buchez et al. forthcoming.

*Prior to the second half of the 4<sup>th</sup> millennium BCE, lightweight architecture was commonplace Egypt. Recent discoveries, including those stemming from the authors' research on the site of Tell el-Iswid (Eastern Delta), have substantially furthered our understanding of the early development of Egyptian mudbrick architecture. These discoveries question or nuance the original hypothesis of a diffusion process from Near Eastern regions, where several centres exhibit the oldest evidence for the use of mudbrick. An overview of all the documentation on the subject leads us to a reflection on the circumstances and modalities of the emergence of mudbrick architecture in Egypt.*

Stone architecture is the best known and the most studied type of architecture in Egypt, but mudbrick architecture is by far the most common and extends to all domains of life, from the simple house to the palace, from small private storage structures to large granaries around temples, and enclosure walls. And yet it seems that the use of mudbrick as the building material for domestic architecture throughout Egypt, including the Nile Valley and the Delta, occurred at a rather late stage. Currently, the earliest evidence dates to the end of the 4<sup>th</sup> millennium BCE, when Nilotic societies were on the pathway towards the State, by which time, it was a fully mastered architectural mode. It thus seems important to focus on how and where it emerged.

Until recently, however, it was very difficult to trace its origins, as the relevant information consisted mainly of indirect evidence, for most of the 4<sup>th</sup> millennium. A brick reinforcement in a Maadi construction or a handful of decorative nails from the Buto occupation levels prompted us to look towards the Levant and beyond to Mesopotamia, where mudbrick architecture had been developing since the 9<sup>th</sup> millennium BCE (**Fig. 1**).<sup>2</sup> The Chalcolithic site of Maadi was the most obvious diffusion relay in the first half of the 4<sup>th</sup> millennium, unless we also consider rather unclear data from the site of Merimde, which would place this diffusion in the 5<sup>th</sup> millennium and the Neolithic period.

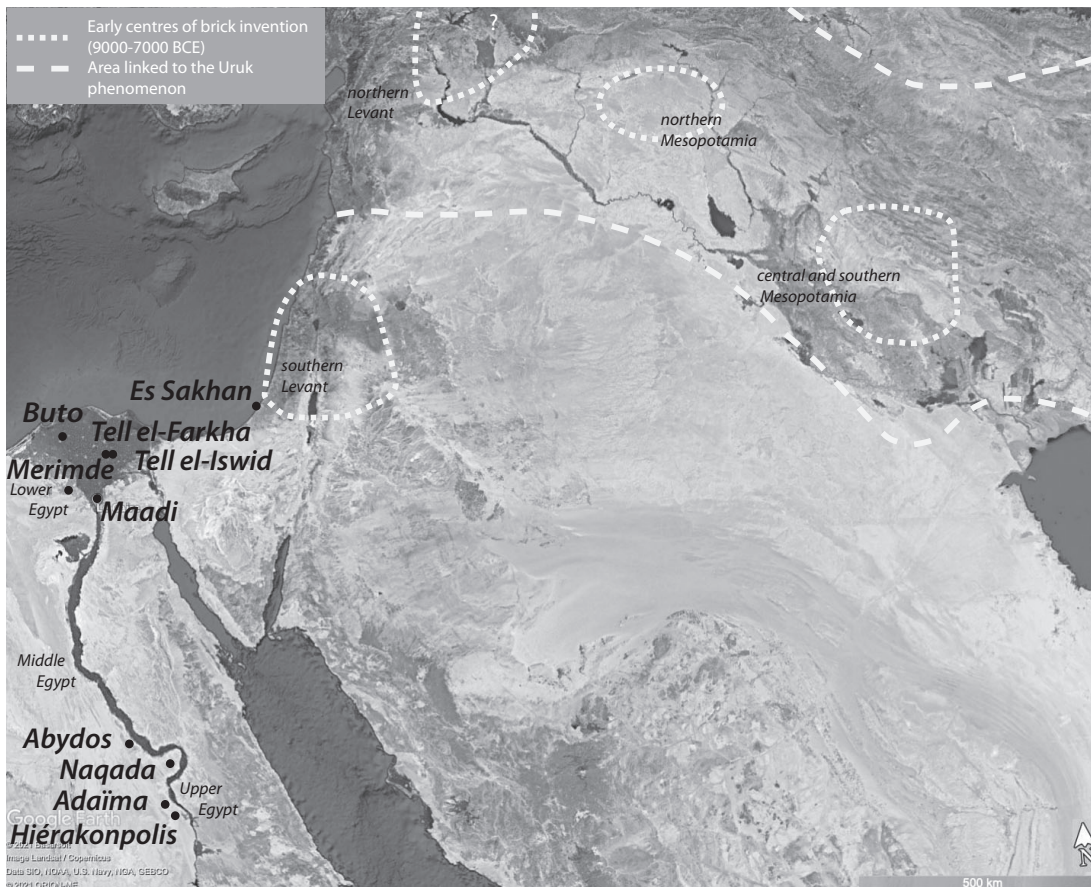
Recent discoveries of hand-shaped brick constructions in the Nile valley and of moulded brick architecture in the delta provide further food for thought for discussions on the formation of Egyptian civilisation and the profound changes that took place at the end of the Predynastic period. Without reiterating the widely debated topic of cultural uniformization in detail, it is nevertheless important to recall the terms of the debate since this question underlies our problem. For some, cultural uniformization or acculturation would be directly associated, in one way or another, with the process of political unification at the turn of the 4<sup>th</sup> and 3<sup>rd</sup> millennia under the impetus of the highly hierarchical societies of the south (Middle and Upper Egypt). For others, a form of uniformization, the breeding ground for political unification<sup>3</sup>, would result from more gradual interactions between Nilotic communities throughout the 4<sup>th</sup> millennium. An emphasis is thus placed on the need to re-evaluate the Delta and the role of the Lower Egypt Culture<sup>4</sup> in the formation processes of Egyptian civilisation. In the domain of brick architecture, the suggestion of an oriental origin relayed by the Delta was reinforced by the discovery, in this

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2. Sauvage 1998, 2009.

3. See in particular Kaiser 1964; Buchez & Midant-Reynes 2007 and Midant-Reynes & Buchez 2019 for the first viewpoint, and Köhler 2014, for the second one.

4. LEC in the rest of the text.



**Fig. 1**  
Map of the sites mentioned, centres of autonomous invention of brick (after Sauvage 2009), geographic area linked to the Uruk phenomenon (after Butterlin 2018: fig. 1).  
© Nathalie Buchez

crossroads of exchanges with the Levant, of moulded brick buildings.<sup>5</sup> On the other hand, for the proponents of evolutionary dynamics essentially driven by Middle/Upper Egypt, the hand-shaped bricks unearthed in that region document a possible source of innovation and a south-north spread with what could be called the ‘Naqadian package’.<sup>6</sup>

Whatever position we adopt, we end up talking about diffusion without making the modalities explicit, without defining the constructive characteristics, nor necessarily analysing the contexts. In other words, without really taking into account reflections on diffusion mechanisms and transmission of technical knowledge that have been developed in the field of anthropology of techniques.<sup>7</sup> Forms of diffusion are different depending on whether they concern isolated technical or stylistic traits or a manufacturing method, or, in this case, construction as a whole. The first case stems from diffusion by *borrowing*, which involves interactions between groups according to technical, social and economic factors that are to be defined. An analysis of the context, of the conditions of change, of the “*milieu favorable*”<sup>8</sup> is a key element to understanding the phenomenon. The second situation, revealed by ruptures in tradition, necessarily stems from *demic diffusion*, i.e., involving the move-

5. Zdziełowski 2008; Chłodnicki 2016.

6. Baba & Friedman 2016.

7. Leroi-Gourhan 1945; Roux 2019: 303-307.

8. According to the notion defined by Leroi-Gourhan 1945.



ment of individuals. Especially as architecture is an object of material culture with high “*inertie technique*”: “(regarding clothes and dwellings)... ce sont des thèmes à diffusion difficile ... thèmes qui s’opposent aux acquisitions métallurgiques ou mécaniques, dont les produits d’avant-garde tendent toujours à devenir universels. La difficulté de diffusion tient à deux causes : au milieu qui conditionne dans une large mesure la maison et à l’inertie technique en vertu de laquelle on ne change pas, à moins d’un grand profit, la forme d’un toit ou d’une fenêtre qui se sont montrés suffisants pendant des siècles ».<sup>9</sup>

This article presents an overview of the scope of available evidence using some past data with more recent documentation from the excavations carried out by the Institut français d’archéologie orientale since 2007 at Tell el-Iswid in the Eastern Delta<sup>10</sup>. In some cases, the older data is sometimes just based on a few descriptive lines, or merely a photo or drawings that do not enable us to go further in the definition of techniques.

## 1. Data prior to the second half of the 4<sup>th</sup> millennium

### 1.1. Merimde and Maadi, experiences with no future?

There are two limitations faced by the study of mudbrick architecture prior to the 3<sup>rd</sup> millennium BCE; firstly, earthen constructions are poorly preserved, and it can generally be difficult to identify them; and, there is little information available on habitat types before the historical period in Egypt. The Neolithic period is generally poorly documented, and the Predynastic period is mainly known for its tombs. Many sites in the Nile Valley were identified in the nineteenth and early twentieth centuries, and only a small number have actually been excavated. This situation is even more exaggerated in the Delta, where Predynastic sites are not very accessible, as they are buried at the base of tells. Although the documented corpus of settlements presents obvious weaknesses, one fact is undoubtedly significant: discoveries of light architecture tend to multiply for the period prior to the second half of the 4<sup>th</sup> millennium, while for the same period there is a lack of convincing evidence for the use of brick. The two examples regularly cited in the literature are debatable.

The first group of questionable evidence cited is from the upper levels of the Neolithic site of Merimde, which was occupied between 5000-4100 BCE. The partially excavated ovoid structures, which were identified during the 1930s by Junker, with irregular rubble facing with silt and straw have long remained an *a priori* for light architecture (**Fig. 2**).<sup>11</sup> It is not known whether these were storage and/or inhabited structures - the largest are 3 m in diameter - and the technique used is poorly characterised. Are we dealing with a light frame filled with clay lumps, similar to what is attested later in the 4<sup>th</sup> millennium,<sup>12</sup> hand-shaped mudbricks or cob bricks<sup>13</sup>, i.e., a stage that could have led to the brick technique? The question remains unanswered.

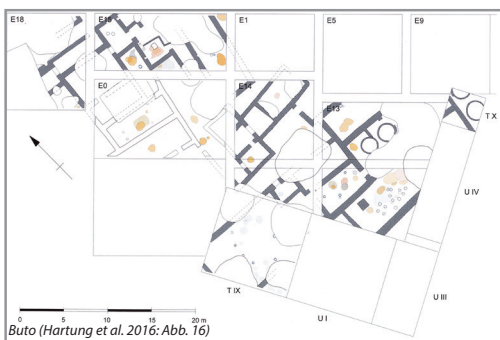
9. Leroi-Gourhan 1945: “habitation” section.

10. With financial support from the Ministry of Europe and of Foreign Affairs, excavation directed by Béatrix Midant-Reynes until 2015, then by Nathalie Buchez.

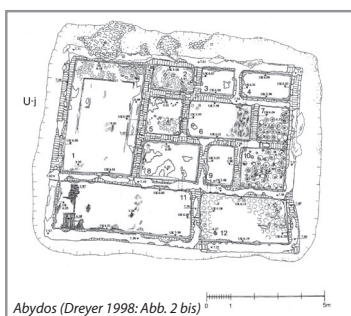
11. Junker 1932, 1934.

12. Cf. §1.2. below.

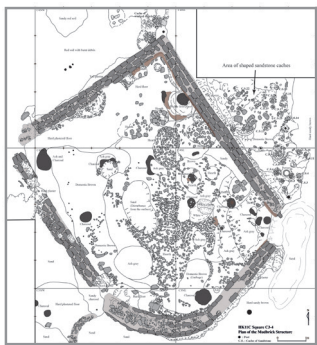
13. Hand-shaped bricks (elements dried in the sun) vs clay lumps or cob balls, or cob bricks (elements used piled on top of each other, when wet), see Knoll et al. 2019 (glossary).



**Fig. 2**  
Summary table (Naqadian chronology after Dee et al. 2013; in grey, the stages of the dynamic involving inter-regional trade). © Nathalie Buchez

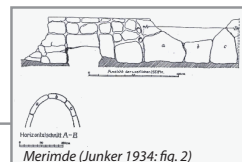
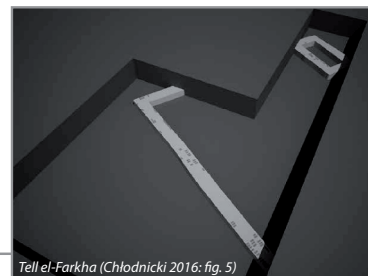


widespread use of mudbrick within the settlement

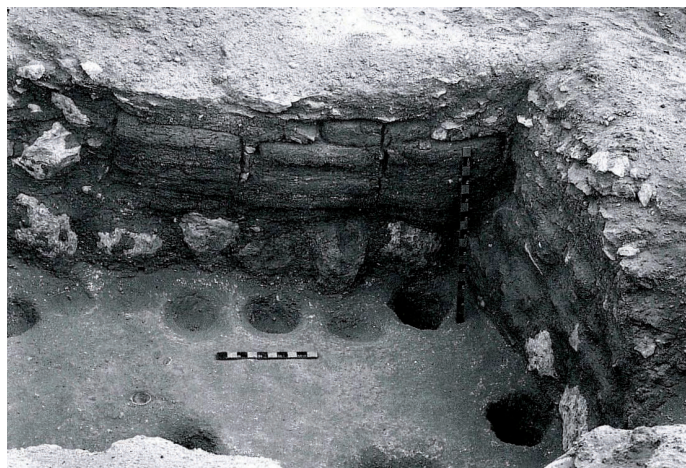


| Dates BC | Middle/ Upper-Egypte | Dynasties    | Lower Egypt | South Levant                     |
|----------|----------------------|--------------|-------------|----------------------------------|
| 2800     |                      | II           |             |                                  |
| 3000     | III C2-D             | I            |             | EBI/EBII<br>Erani C/<br>late EBI |
| 3200     | III A2-B             | 0<br>Iry-Hor | 3           | early EBI/<br>Erani C            |
|          |                      | (Uj tomb)    | 2           |                                  |
|          |                      |              | 1           |                                  |
| 3400     | III D/III A1         |              | Ib/IIIa     |                                  |
|          |                      |              | Ia/I Ib     |                                  |
| 3600     | III B/III C          |              | I/IIa       |                                  |
|          | III B/III C          |              |             |                                  |
| 3800     | III B/III C          |              |             |                                  |
| 4000     |                      |              |             |                                  |
| 4200     |                      |              |             |                                  |

(after Dee et al. 2013)



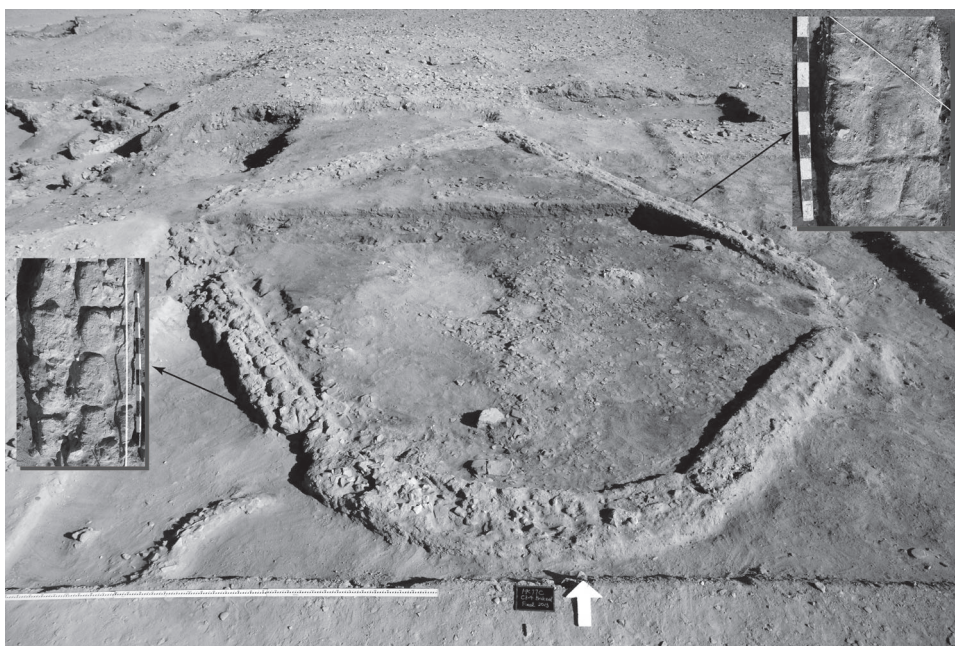
**Fig. 3**  
Maadi, Hierakonpolis  
tomb 100, HK11-square  
C3-4.



*Maadi (Rizkana & Seeher 1989: pl. XV, 2)*



*Hierakonpolis tombe 100 (Quibell & Green 1902: pl. LXXV)*



*Hiérakonpolis, HK 11C, square C3-4 (Baba & Friedman 2016: fig. 16)*

The second example can be found on the Predynastic site (3900-3500 BCE) of Maadi, also in Lower Egypt (**Fig. 3**). The evidence consists of 60/50-cm-long raw-earth slabs (9-10 cm wide and 10-15 cm thick) in limestone block masonry reinforcing the walls of an underground quadrangular structure.<sup>14</sup> The published description based on excavators' notes is succinct. Here too, the technique used is poorly characterised. Are they really bricks (i.e., elements used after drying) or blocks cut from soil/cut cob<sup>15</sup> used wet, a technique known in other regions to have been a key stage towards the advent of the moulded brick<sup>16</sup>? These elements are not part of the construction method, but their presence could be an indirect indication of the use of brick on a larger scale in Egypt. However, the case of Maadi is recognised for its specificity. Its semi-subterranean structures are *unicum* for Egypt, whereas there are parallels in the southern Levant. The architecture at Maadi is considered to be the work of people who migrated from the Levant with, among other things, their architectural traditions.<sup>17</sup> In this context, it is legitimate to wonder, if they are bricks, whether the use of brick, which constitutes a large part of the elevations with or without stone bases in the southern Levant,<sup>18</sup> is not also imported knowledge.

The totally or partially dug out model is poorly adapted to unstable sandy soil, and does not seem to have been developed in Egypt during 4<sup>th</sup> millennium. Nor does the stone base, due to the lack of stone material. As far as brick is concerned, the required natural resources are undeniably available and the climate is favourable, but documentation reveals no evidence of transfer. In fact, when the mudbrick is found in several sites subsequent to Maadi,<sup>19</sup> the construction characteristics are not what we would expect of diffusion from the Levant. If we consider the Egyptian technical system, rather than the fact of building in brick, we can observe that it has very little to do with what is described for the South Levant. The systematic length/width ratio of 1.2 in Egypt is very different in the South Levant, where the average ratio is closer to 1.5.<sup>20</sup> The square bricks and the stretcher on edge of the Early Bronze Age I of the South Levant (3500-3100 BCE) are aspects that are not found in the Egyptian system of the same period, which was based solely on the alternating use of headers and stretchers. Moreover, when Egyptian populations settled in the Levant at the end of the period, their settlements are identified as much by the construction techniques employed, called Egyptian tradition, as by the pottery assemblages mixing imports and Egyptian productions using local materials.<sup>21</sup> In the absence of arguments in favour of a transfer phenomenon in the first half of the 4<sup>th</sup> millennium or of an expansion of techniques following possible development at sites such as Merimde, we should perhaps consider the possibility that society had no need for such architecture, and that this hindered its diffusion/adoption.

14. Rizkana & Seeher 1989: 54-55, pl. XV, 1-2.

15. See Knoll et al. 2019, respectively: 24 and 15.

16. Northern Mesopotamia, Hassuna period (7000 - 6000 BCE), Sauvage 2009.

17. Hartung 2003 et al. 2003; Hartung 2013.

18. Sebag 2011: 111.

19. Cf. below.

20. Sebag 2011: 84.

21. See the example of the trading post of Tell es-Sakhan, Miroschedji et al. 2001.

## 1.2. Earth use in Egypt in the first half of the 4<sup>th</sup> millennium

Traces of surface lightweight architecture have also been reported at Maadi,<sup>22</sup> for settlement phases prior and contemporaneous to the semi-subterranean structures. Excavations carried out since then regularly document these light constructions for the first half of the 4<sup>th</sup> millennium, both in Lower and Upper Egypt. They were particularly well studied at Tell el-Iswid,<sup>23</sup> where earth elements reminiscent of a plaster coating on a plant panel were six times more abundant than daub fragments. Moreover, the latter were not very thick and related to walls with widths not exceeding 6 cm. The average size of the imprints preserved on these elements is between 1 and 2 cm, which is consistent with the majority of the calcified plant remains observed *in situ*, which were placed side by side against the walls of narrow trenches. Other calcified branch type elements<sup>24</sup> were occasionally observed in a horizontal position at the bottom of the trench.

Post wedging structures are also recorded on the site, sometimes directly beside the trenches. We can assume that other, more isolated structures were used to hold roofing supports in place, but no configuration corresponding to a timber building frame has been observed. These data outline a construction method in which earthen material was used as coating on a thin, tightly packed (reed-type) lath, the base of which was inserted in a trench, rather than as infill of a wooden frame. The outcome of this construction method produced multiple redevelopment and reconstruction phases which, at Tell el-Iswid, as in all the layered sites in Lower Egypt,<sup>25</sup> generate impressive trench entanglements that are difficult to interpret (Fig. 4). Above all, we can discern vast palisaded multi-celled ensembles within which some activities took place, as evidenced by the presence of combustion structures, but perhaps also single-celled units, more similar to what was recorded at Maadi or further south in the Valley.

In parallel to this light architecture in Lower Egypt, examples of reed mat fences coated with earth and alignments of stakes or plant stem extremities have been excavated at Hierakonpolis<sup>26</sup>, in Upper Egypt. The latter are reminiscent of those discovered at Adaïma on the periphery of organic areas.<sup>27</sup> In all cases, these remains have been identified as domestic units. At Adaïma, since the ground is no longer made up of loose sand but gravel, settlement trenches were also identified.<sup>28</sup>

Concurrently occurring at Hierakonpolis, these same techniques were used in an area described as ceremonial in light of the associated assemblages of objects,<sup>29</sup> and also in the funerary domain for enclosures made up of stakes rather than posts.<sup>30</sup> The construction of these enclosures surrounding the graves appear to have been larger compared to what is observed in the settlement area, with a framework of stakes set in deep trenches, plant panels placed on either side of these stakes, double-layered on one side and with an inter-

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22. Rizkana & Seeher 1989: pl. XII, 3-4, pl. XIII, 1-5.

23. Gerez 2016.

24. Possibly elements stiffening the wall at its base?

25. Tell el-Farkha: Chłodnicki & Geming 2012; Buto: Hartung 2021.

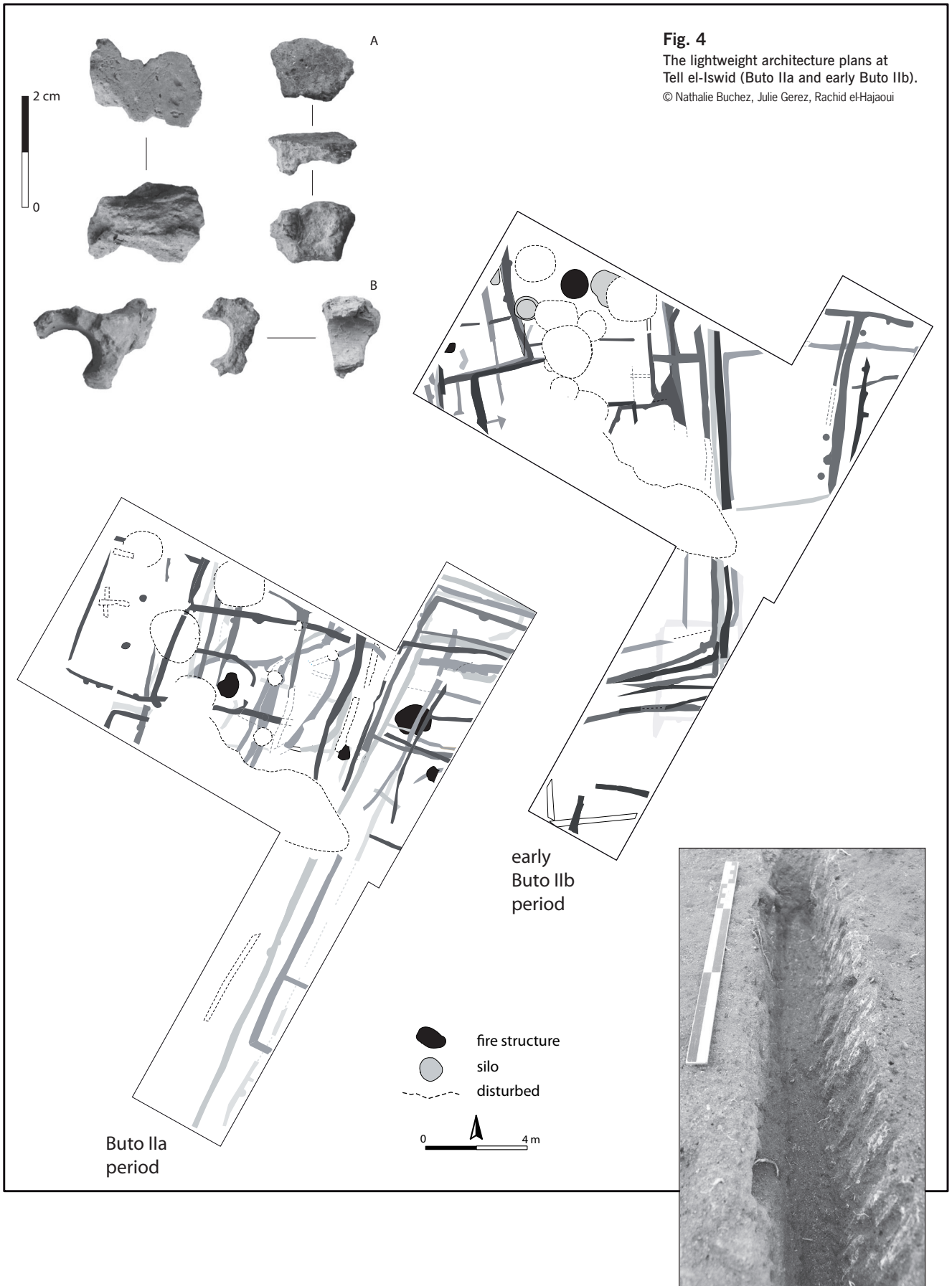
26. Sector HK11, Friedman et al. 2002; Watrall 2000.

27. Buchez 2008.

28. Midant-Reynes et al. 1991: pl. 64.

29. HK29A, Friedman 2009.

30. HK6, Friedman 2009; Friedman et al. 2017.



**Fig. 4**

The lightweight architecture plans at Tell el-Iswid (Buto IIa and early Buto IIb).

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mediate 10 cm filling of earth and plants.<sup>31</sup> In this necropolis, genuine post architecture, i.e., with potentially load-bearing post frames, is also observed in alignment with the tombs.

The stratigraphic sequence of Tell el-Iswid indicates that the structures made from light materials continued to be constructed after mudbrick architecture was introduced. It is still recorded during the Buto IIIa period, and until mudbrick architecture became widespread in the following period at Naqada IIIA2-B<sup>32</sup>. We must remain cautious in light of the ephemeral nature of poorly conserved earthen structures, but the absence of any evidence of brick at settlements, such as Adaïma which was occupied until the first dynasties (Naqada IIIC-D), raises questions about the persistence of this traditional architecture in Upper Egypt, at least at the scale of the village, and on the fringes of major centres.

The morphology of the buildings and the structuring of the settlement in relation to this type of architecture are far from perfectly understood. In view of the particular lightness of these structures, we can also wonder about the related occupation modes. A late adoption of mudbrick for housing would be easily understandable in a traditional context where a certain form of mobility is still associated with settlement. At Adaïma, to return to one of the rare extensively excavated settlements in Upper Egypt, the stratigraphic sequences on the different loci or sandy mounds of this 20-hectare site show discontinuities<sup>33</sup> which may be the result of cyclical occupation.<sup>34</sup>

## 2. Data from the second half of the 4<sup>th</sup> millennium, the conditions of the emergence and development of mudbrick architecture

### 2.1. Middle/Upper Egypt

#### 2.1.1. A possible hub of invention

Brick architecture is first attested in the middle of the 4<sup>th</sup> millennium in Upper Egypt on the vast complex of the site of Hierakonpolis.

One of these occurrences, located in sector HK29 and preserved by fire,<sup>35</sup> corresponds to a half-buried (from 0.45 m to 0.80 m), single-cell unit (4 m by 3.50 m), consisting of two parts: a low wall of clay nodules, including fragments of quadrangular brick, against the pit walls, and a light architecture on above-ground posts. One of these *a priori* hand-shaped brick fragments bears fingerprints. The location of the posts implanted in the masonry base is preserved by charred residues.

Here, the brick is reused. In the HK11C sector, it was found *in situ*, forming the walls, potentially masonry substructures or low walls, of a structure measuring 9 m by 7.50 m<sup>36</sup> and of a probable enclosure.<sup>37</sup> The bricks of the structure

31. Friedman et al. 2017: 244.

32. For an outline of the dates corresponding to the phasing used, cf. Fig. 2.

33. Buchez 2008.

34. Seasonal? with intervals of several years?

35. Hoffman 1982.

36. Square C3-4, Baba & Friedman 2016: fig. 15, 16 & 18.

37. Square C10-11, Baba & Friedman 2016: fig. 12-14.

in the C3-4 area (Figs. 2 & 3) are quadrangular, irregular, round-edged elements (hand-shaped bricks), measuring 25/30 x 15 x 7-8 cm, arranged in three rows of stretchers. The dimensions of the bricks; the width/length ratio, which raises the possibility of an alternating arrangement of stretchers and headers; and the 1½ brick width of the wall are characteristic of moulded brick architecture some 200-300 years later when this form became widespread.

The pottery assemblage associated with the construction of sector HK11C is positioned in the lower part of a C-14 dating range (4595±40 BP, 3515-3109 cal BCE) obtained from a charred plant stem found at the base of the wall. This corresponds to a Naqada IIC date, and is probably a little more recent than that of sector HK29. Radiocarbon testing of a charred plant stem from the base of the wall in C10-11 at the same site provided a date of 3627–3363 cal BCE (C-14 4671±40 BP), which corresponds roughly to the Naqada IIB–IIC period. The fundamental point to be considered is the context in which these constructions were found. A domestic function is usually suggested for the building in sector HK29, which contains a hearth and a vessel implanted in the occupation floor, but it is nevertheless spatially associated with an area of ovens. In the case of sector HK11C, the space bounded by brick masonry, which may or may not have been covered, is essentially occupied by combustion structures. Furthermore, the faunal assemblage differs from what is expected for the period in a domestic context, strictly speaking. Indeed, choice pieces of animal remains are sparsely represented, suggesting that the sector was used for food preparation.<sup>38</sup> The structures in sectors HK29 and HK11C are thus linked to activities (pottery, smoking food?) which seem to go beyond the strictly domestic context, whatever the level of specialisation<sup>39</sup>. This coincidence did not escape the attention of the excavators who consider the world of craftsmanship, and above all the world of potters, as a fertile breeding ground for the invention of brick.<sup>40</sup> But beyond this, what can be considered as decisive in 4<sup>th</sup> millennium Egypt, in the same way as what has been observed in other periods in the Near East where architectural developments are intricately linked to social facts,<sup>41</sup> is the phase in the evolution of Nilotic societies when this innovation took place. For these societies, or at least for those in Middle and Upper Egypt, this phase, which roughly corresponds to the middle of the 4<sup>th</sup> millennium, marks a shift towards a system of production/redistribution which represents a stage on their route towards the State and likely corresponds with changes in settlement modes.<sup>42</sup>

### 2.1.2. Developments undoubtedly restricted to specific contexts

That said, for Middle and Upper Egypt, to date, there is no sign for the third quarter of the 4<sup>th</sup> millennium that can be clearly linked to a development of the brick architecture technique in the settlements. The only occurrence of above-ground constructions is currently limited to Hierakonpolis and its ceremonial enclosure of 40 m by 12 m,<sup>43</sup> that was redeveloped in the late Naqada IID-

38. Baba et al. 2017.

39. The question of specialisation is undoubtedly more complex than generally admitted in the literature on the Predynastic period, but that is another debate.

40. Baba & Friedman 2016: 203.

41. Sauvage 1998: 88.

42. Especially if we consider what they might have been in the first half of the 4<sup>th</sup> millennium, cf. above.

43. HK29A, cf. above.



Naqada IIIA period.<sup>44</sup> The remains of two walls were unearthed in this sector, which at least partially replaced the old palisade system, as well as the bases of a probable massive square construction, of at least 4 to 5 m<sup>2</sup>, located at one end of the enclosure. The whole structure is very flat and has been partially dismantled, but the thickness of one of the walls, consisting of small bricks (23 x 13 cm) arranged in headers and stretchers, has been estimated at 1.80 m. From mid-Naqada II onwards, brick was also used in the funerary domain, in connection with the cemeteries of the elite. Tomb 100 in Hierakonpolis is the oldest and best documented example of this, although only in a few lines<sup>45</sup> and some photos were published (**Fig. 3**); it is contemporaneous with constructions in the HK11C sector<sup>46</sup>. The tomb undoubtedly belonged to an important figure, given the iconography of the wall painting in the subterranean tomb. It comprises a facing wall and a brick wall partition, said to be very irregular in size.<sup>47</sup> According to the average dimensions provided (23 x 11.5 x 9), these bricks are, as in HK11C, twice as long as wide, and the presence of a layer of headers inserted between the courses of stretchers is noted in the upper part. After that, the most remarkable example is the large Uj tomb in the necropolis of Abydos (Middle Egypt), from the Naqada IIIA1 period, which is generally recognised, in view of its design and burial goods, as the one of a dynasty.<sup>48</sup> The facings, and the partitions, which in this case divide the space into several chambers, are made of regular (moulded?) small-sized bricks (22 x 10 x 6 cm), arranged in headers and stretchers, in alternating rows,<sup>49</sup> to form walls from 1 ½ to 2 bricks wide (**Fig. 2**). Contemporaneous but less complex double-chamber tombs in the same cemetery are in line with Tomb 100 in Hierakonpolis and those in the eponymous Naqada site, some of which are dated to Naqada IIC-D.<sup>50</sup>

The affiliation between these funerary structures hardly seems debatable. The available data lead us to infer a transition from hand-shaped brick to moulded brick with a wooden frame. However, this evolution is relatively difficult to understand, since no simultaneous developments requiring standardisation have been detected. The use of mudbrick does not appear to be generalised in the settlement and for all its architectural components (administrative complex, simple domestic unit...) until later (at Naqada IIIA-B), and no monumental architecture is identified until the following period. In this domain, it is worth mentioning the enclosure of Khasekhemwy, with its 5-m-thick walls at the base and its monumental entrance decorated with niches and recesses, which dates from the end of the 2<sup>nd</sup> Dynasty (c. 2686 BCE, Naqada IIID)<sup>51</sup>. In the southern Levant, it is also possible to establish a link in the Early Bronze Age between the emergence of moulded brick, which was faster to produce, and the development of urbanisation.<sup>52</sup>

44. Friedman 2009.

45. Quibell & Green 1902: 20; Friedman 2008.

46. Cf. Case & Payne 1962 and Payne 1973, for the inventory of grave goods which led to the dating of the tomb, several years after its discovery.

47. And therefore, probably hand-shaped?

48. Cf. below § 2.2.2.

49. Dreyer 1998: Abb. 2 bis.

50. Kemp 1973; Friedman 2008.

51. Cf Moeller 2016 for an analysis of elements of urbanism and their emergence in Egypt.

52. Sebag 2011: 180.

In the specific context of Egypt, mud brick may have remained, for a time, an element of prestige, as both the funerary domain and the enclosure of sector HK29A seem to indicate. Nevertheless, we cannot exclude the existence of many more structures that have since been destroyed<sup>53</sup> or buried in unexplored areas of Middle and Upper Egypt, as they are more difficult to access than the desert fringes of the Valley.

Regarding sites that have been destroyed, we can cite, for example, the enclosure wall of the Naqada site that was uncovered at the end of the 19<sup>th</sup> century<sup>54</sup>; it had not been reliably dated before it disappeared.<sup>55</sup> As for sites that have yet to be fully excavated, there is the thick (enclosure?) 3 m mudbrick wall found in the lower part of the Kôm el-Gemuwia stratigraphic sequence, in the Hierakonpolis sector located on the margins of the alluvial plain.<sup>56</sup> In this case, interpretations such as dating (Naqada IID/Naqada III transition), which are based on data from test pits would need to be substantiated by more extensive excavation.

## 2.2. Lower Egypt

### 2.2.1. Construction characteristics and architectural form

In this geographical sector, brick architecture seems to have emerged towards the end of the second third of the 4<sup>th</sup> millennium (i.e., at the end of the Buto IIB period of the Culture of Lower Egypt which corresponds with the late Naqada IIC-early Naqada IID phase of Naqadian chronology). So far it has only been recognised on the settlements of Tell el-Farkha and Tell el-Iswid, but these are also the sites where the LEC levels of this period have been most extensively excavated.

The construction characteristics observed on these two sites are those found a little later when mudbrick architecture became widespread throughout Egypt - i.e., the same brick module, small in size and twice as long as it is wide (30/26 cm x 15/13 cm), with a stretcher-header technique, without a sitting trench, with the difference that the two lower courses are made of larger bricks (40 cm x 20 cm).<sup>57</sup> The sides of the bricks, which are very straight with a compacted surface, also bear marks of the use of a frame for their manufacture (Fig. 5)<sup>58</sup>.

Although they may appear imposing alongside traditional constructions made of light materials and hand-shaped brick walls or low walls of the HK11C sector in Hierakonpolis, these structures cannot be described as complex. They take the form of enclosures that are made up of long, thick walls (1.20 m at Tell el-Iswid, 1.40 m to 1.60 m at Tell el-Farkha) delimiting vast areas which current excavations have not yet managed to fully define. Of the three late Buto II ensembles, two present the same plan; those at the Central Kom at Tell el-Farkha and Tell-el-Iswid, with an initial construction phase (as indicated

53. Cf. Hendrickx 2001 for similar considerations concerning funerary architectural superstructures.

54. Petrie & Quibell 1896: 54, pl. LXXXV.

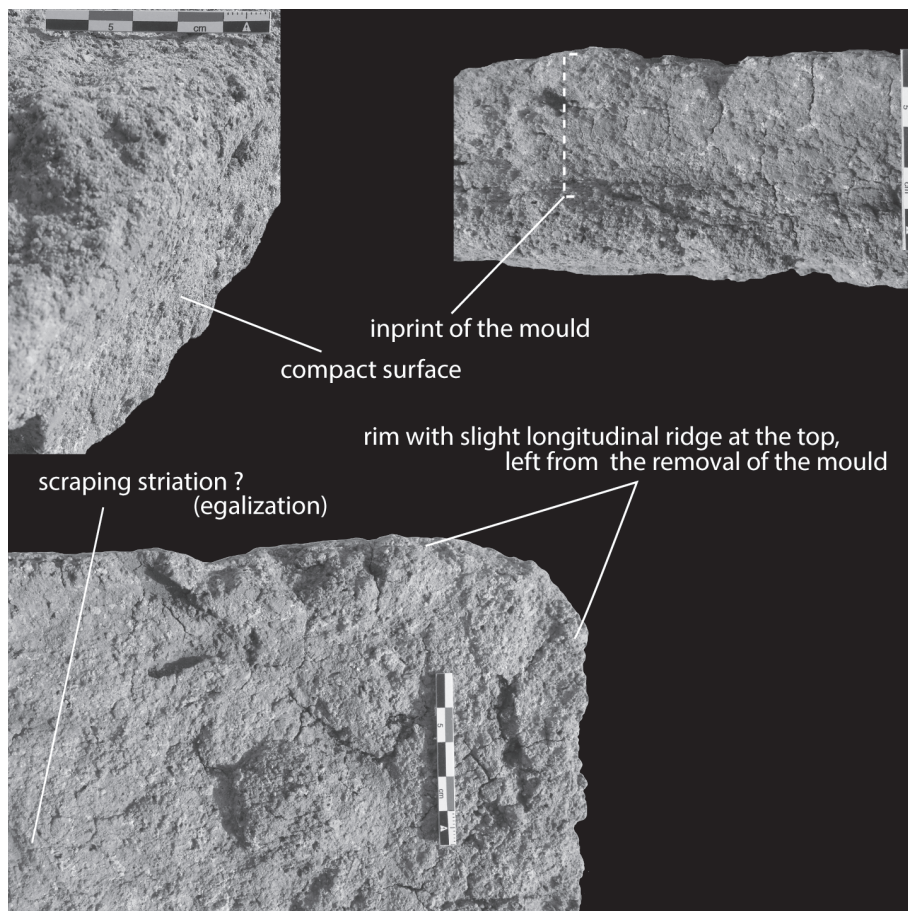
55. Naqada IID/Naqada III or later than Naqada II?, see Chłodnicki 2016.

56. Hoffman 1986: 12.

57. Chłodnicki 2016; Buchez et al. 2021.

58. Observations made at Tell el-Iswid during the dismantling of the walls; see Baudouin 2020: Table 1, regarding identification criteria of brick manufacturing methods (in particular based on marks left by the "chaîne opératoire").

**Fig. 5**  
Detail of mudbrick with marks  
indicating of the use of a mould  
for their manufacture.  
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by the wall ties), consisting of a room in one of the corners of the enclosure<sup>59</sup> (Figs. 2 & 6). The areas concerned are closest equivalent: 5.20 x 2.40 m at Tell el-Farkha, and 6 x 3 m at Tell el-Iswid where three aligned post holes indicate the location of a central row of roofing supports. An internal access marked by an interruption in the building frame is also identified at Tell el-Iswid, which is not the case at Tell el-Farkha. However, due the partial destruction of the outer wall, it is not possible to determine whether it was complete or whether there was a passage more or less in the axis of the previous one. In this case, we would not really be dealing with a corner room, but with an access system. The third recognised example, that of the Western Kom of Tell el-Farkha, situated about 100 metres from the Central Kom, corresponds to a set of walls delimiting a space occupied by a brewery complex.<sup>60</sup> However, in this case, the plan and stratigraphic data are insufficient to propose a precise outline of the building.

The similar configuration at Tell el-Iswid and on the Central Kom of Tell el-Farkha (if not on the Western Kom as well), points to the same architectural project, the main element of which is an enclosure wall. A monumental entrance, potentially acting as a protected/controlled passage, could be another

59. Chłodnicki & Gering 2012 and Chłodnicki 2016 for Tell el-Farkha; Buchez et al. 2021 for Tell el-Iswid.

60. Ciałowicz 2012, 2014/2015.

element. A more recent layout of Tell el-Farkha dated to the Buto IIIa period (or late Naqada IID-Naqada IIIA1 of the Naqadian chronology) has been discovered in a third sector of the site, the Eastern Kom. It has been identified as such a system. The excavation window, which opens onto a small room (6 m by 2.50 m) has thick brick walls with openings placed almost opposite each other<sup>61</sup>; however, it is too small to assess the context in which the structure is situated in. The Tell el-Iswid documentation also provides an example for the following period (Naqada IIIA2-B) of a small construction (2.50 m by 2 m) integrated into the corner of a large space enclosed by walls (Fig. 6). The circulation patterns within the building cannot be determined due to the state of preservation. It should simply be noted that at least one of the walls is reinforced by half a brick wider than the surrounding walls, which is a possible indication of a higher elevation.

However, the plans are partial and it is not known whether the excavations carried out on each of the studied sites show the same sectors, which limits their interpretation. The configuration of the Buto IIb enclosures shows some parallels with the Early Bronze Age I temples of the Levant (3500-3100 BCE) which, like those of En-Gedi or Meggiddo (level J3), present an oblong room leaning against an enclosure wall that closes a courtyard accessed by a monumental entrance.<sup>62</sup> Within the Egyptian evidence, the quadrangular plan with an access building at the corner is the one that later characterises the large funerary enclosures of Abydos dating to the 1<sup>st</sup> Dynasty (i.e., at Naqada IIIC2-D).<sup>63</sup> In fact, the same simple configuration is associated with the same restricted access requirements regardless of the context.

Another of the characteristics common to Tell el-Farkha (Central Kom) and Tell el-Iswid seems to be the limited detrital accumulations<sup>64</sup> which contrast with what can be observed 'outside the walls', either because there was no intense activity in the enclosed area, or because waste management methods were not analogous. At Tell el-Iswid, the settlement level is particularly thin and only a few fleetingly used short-term combustion structures, as well as three small pottery vessels (of the gourd and bowl type) 'forgotten' along the walls, have been recorded in the internal area. At Tell el-Farkha, the sparse recorded remains are nonetheless specific: the presence of mace heads, beads in semi-precious materials and gold, and a copper knife, identified this as a place of residence<sup>65</sup>. This proposal is also based on a comparison with the remains of the Eastern Kom, where beer production, an activity that is supposed to take place outside a strictly domestic setting<sup>66</sup>, is also in a perimeter defined by brick walls. This evokes the idea of a sectorised spatial organisation of the settlement that is largely controlled by an elite that builds in brick.<sup>67</sup> The image of an enclosure or of a residential enclosure, possibly associated with an

61. Ciałowicz & Dębowska-Ludwin 2013; Ciałowicz 2014/2015; Chłodnicki 2021.

62. Adams et al. 2014.

63. Bestock 2008.

64. Cf. Chłodnicki 2021 for Tell el-Farkha.

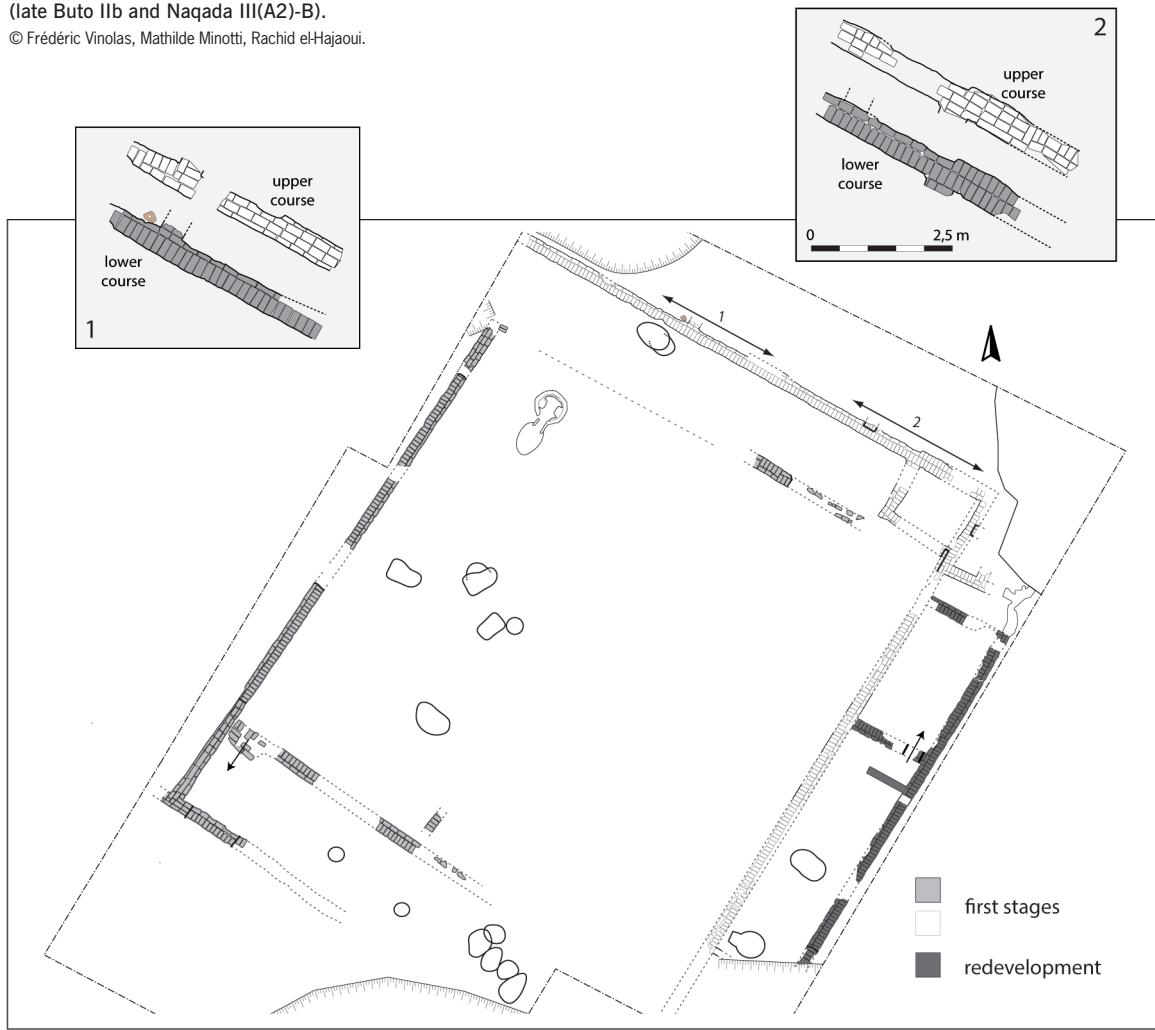
65. Chłodnicki & Geming 2012; Chłodnicki 2021. We also note an overrepresentation of exogenous pottery from the Levant and Middle/Upper Egypt (Chłodnicki 2021). Due to the fineness of the occupation layer, no such observation is possible at Tell el-Iswid, where, on the contrary, the levels posterior to the destruction of the enclosure indicate a clear increase in imports from Middle/Upper Egypt at the scale of the whole excavated zone (cf. *infra*).

66. This point of view is accepted for the breweries of Lower Egypt or Middle/High Egypt.

67. Chłodnicki 2016.

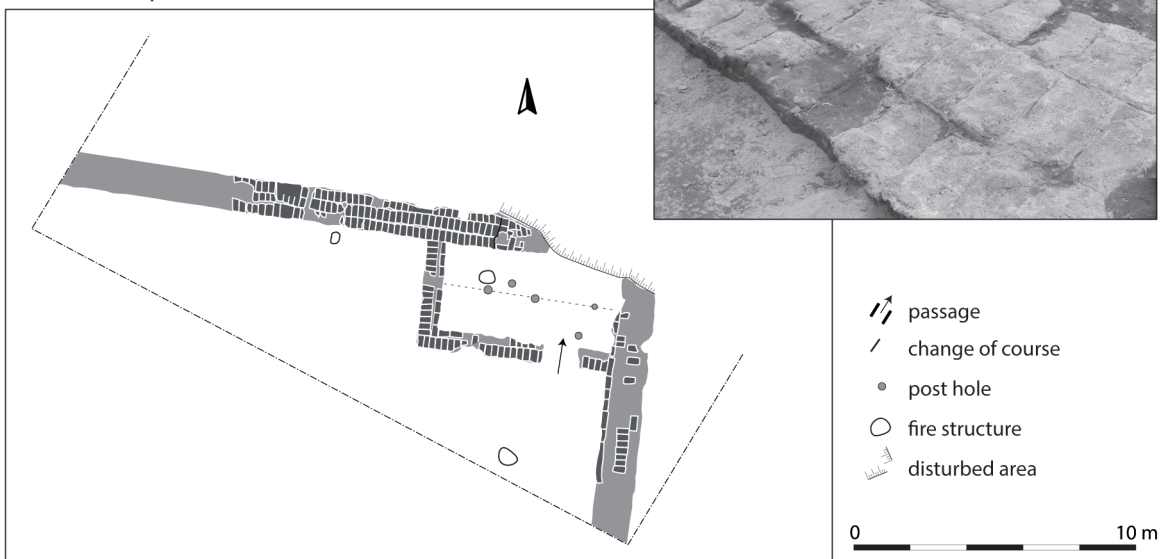
**Fig. 6**  
The mudbrick architecture plans at Tell el-Iswid  
(late Buto IIb and Naqada III(A2)-B).

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Naqada III(A2)-B period

late Buto IIb period



activity that goes beyond the domestic and agricultural domains, can be found in the example of Naqada IIIA2-B at Tell el-Iswid, mentioned above for its possible entrance building (Fig. 6). At the opposite corner of this aedicula is a long building comprising of hearths. Other combustion structures are found in the intermediate open space, one of which with a separate heating chamber which could have been a potter's kiln, although no evidence of *in situ* production was found.

### 2.2.2. What are the emergence modes?

The available chronological data lead us to situate the first architectures of the Delta a little after the hand-shaped brickwork attested in Hierakonpolis (Fig. 2), but before the construction of the great Uj tomb in Abydos.<sup>68</sup> Out of the approximately 700 vessels deposited in this tomb, many come from the Levant, demonstrating the exchanges with this region as well as the ability and willingness of the elites of the time to organise exchanges for their benefit.<sup>69</sup> On the other hand, certain practices and concepts that emerged during this same period, relating for example to the use of the cylinder and written notation, show borrowings from the distant Uruk sphere and possible direct contacts.<sup>70</sup> The first imports of pottery from the Valley detected more or less at the same time at the sites of the Delta and the southern Levant<sup>71</sup> are slightly older and reveal that networks were set up earlier, likely at the end Naqada IIC-beginning Naqada IID. The scale of the processes had completely changed by the time the tomb Uj was constructed. In Lower Egypt, this stage was marked by an increase in the number of pottery vessels coming from Middle and Upper Egypt, especially pots and jars potentially related to the transport of commodities. These fluxes could also be accompanied by mobility and technical transfers as revealed by current studies of the Tell el-Iswid pottery assemblages from the Buto IIIa period (or late Naqada IID-Early IIIA1), even if a third stage only occurs later, at Naqada IIIA2-B, when a standardised level of non-local technical production originating from Middle/Upper Egypt is identified in Lower Egypt.<sup>72</sup> Based on these manufacturing techniques and our knowledge about the learning processes, potters from the south should be considered the drivers of the changes which affected the production system of the Delta region at that time.<sup>73</sup>

In view of our current knowledge, the emergence of mudbrick architecture in the Delta is integrated in one way or another into these south-north dynamics since it appears synchronously at Tell el-Iswid and Tell el-Farkha at the transition of stages 1 and 2 of the process<sup>74</sup> (Fig. 2). Since architectural traditions related to light materials<sup>75</sup> were quite different, the most plausible hypothesis links the transmission/acquisition of this new technique to the circulation of the individuals with this knowledge, even if they are not necessarily specialised craftsmen, as in the case of these low complexity structures. With this in mind,

68. Cf. above § 2.1.2.

69. Guyot 2004, 2008.

70. Joffe 2000; Guyot 2004.

71. Braun 2014.

72. Bajeot & Roux 2019; Bajeot & Buchez 2021.

73. Bajeot & Buchez 2021.

74. According to the stratigraphic data from the site of Tell el-Iswid.

75. Cf. §1.2 above.

it is tempting to turn to the region at the origin of the flows and dynamics of interest here, namely Middle and Upper Egypt, which was familiar with brick construction. However, because of the current state of the documentation we have to be careful and return here to the remaining grey areas concerning the transition to moulded brick in this region.<sup>76</sup> This leads us, in the hypothesis of a complex genesis of Egyptian mudbrick architecture<sup>77</sup>, to also look towards Mesopotamia and the Uruk culture.

It is conceivable that the development of trade relations with the Levant initially concerned the populations of Lower Egypt, who were at least partly native to this region. It has even been argued that the LEC economic and social model could derive from Levantine settlement patterns at the beginning of the 4<sup>th</sup> millennium and from the exchange-based relations that Lower Egyptian communities continued to maintain with those of the Levant.<sup>78</sup> Some features of Middle-Upper Egyptian assemblages from the middle of the 4<sup>th</sup> millennium are in fact the result of an adaptation based on Levantine influences that were relayed by the Delta<sup>79</sup>.

In the field of architecture and during a more recent period, however, the communities of the Delta did not so much integrate and relay southern Levantine influences, but rather adopted more distant architectural features. The construction characteristics of the Levant prove to be different from the Egyptian system.<sup>80</sup> The terracotta cones discovered at the site of Buto in the western Delta could be one of the clearest indicators of borrowing from the Uruk cultural sphere in the architectural field<sup>81</sup>. Although these remains have been diversely interpreted, the idea of decorative nails similar to those from Mesopotamia is strong. However, the dating of the nails remains difficult. There is no known monumental architecture at the site of Buto prior the 1<sup>st</sup> Dynasty (Naqada IIIC-D) and the locally manufactured nails were found distributed throughout the stratigraphy of the site, from the base of the sequence dating back to the first half of the 4<sup>th</sup> millennium<sup>82</sup>. For those who are accustomed to the excavation of the complex and often very reworked stratigraphy of the Delta, this is hardly surprising; however, we must refer to the Mesopotamian chronology to date these elements. Unfortunately, the most plausible date range is wide; this corresponds to the time when buildings with nail mosaics were identified in northern Syria. It actually covers the Buto IIIa period, stage 2 of a process at the dawn of which the first mudbrick structures of the Delta were constructed, as well as the following stage, when this architecture was already well established in the Egyptian Delta and even in an Egyptian form in the south Levant.<sup>83</sup> These clay cones may represent limited borrowing and could be linked to the symbolic sphere – in the Uruk world, nail mosaics are associated with buildings defined as places of power. Or, in the hypothesis of

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76. Cf. above § 2.1.2.

77. Or the hypothesis of differentiated progression between Upper/Middle Egypt and Lower Egypt suggested by one of the authors in Midant-Reynes & Buchez 2019: 148.

78. Guyot 2008; Hartung 2013.

79. The phenomenon has been studied for lithics (Buchez & Midant-Reynes, 2007). It is only inferred for pottery.

80. Cf. above §1.2.

81. For a summary of the question, cf. Guyot 2004.

82. About terracotta cones discovered at Tell el-Isuid in the Naqadian levels, cf. Minotti 2014: fig. 11 n°4-6.

83. Cf. above § 1.1 concerning the site of tell es-Sakhan.

early dating, they could attest to a more global phenomenon of adoption by the LEC communities of a construction mode, a phenomenon which would manifest both a form of hierarchy which is not, or only slightly, expressed in the funerary domain<sup>84</sup> and the role of these communities in contacts with their distant Mesopotamian neighbours.

The question of nails is part of the wider controversy on the endogenous or exogenous (Uruk) origin of the niched façade. We will not reiterate all the elements of the debate here<sup>85</sup>, but simply underline that the technical aspects are often not taken into account in the discussion whereas the architectural developments of the Uruk period are very specific from a technical point of view. The identification of ‘Uruk colonies’ – even if the so-called Uruk expansion (Fig. 1) is still poorly understood and also controversial – is partly based on these specific features.<sup>86</sup> This particularly relates to the emergence and use of very standardized small-sized bricks (*Riemchen*)<sup>87</sup> with a square cross-section during the recent Uruk-Djemdet Nasr (3300-2900 BCE). This innovation can be explained by the time saved in bricklaying in a context of the expansion of monumental architecture and of ‘niche decoration’.<sup>88</sup> In Egypt, the use of small bricks with a square cross-section is also recorded for the construction of facades with niches in certain mastabas in the first half of the 1<sup>st</sup> Dynasty<sup>89</sup>. Such evidence, in a context where the use of elements with rectangular cross-sections (and 25/30 cm long)<sup>90</sup> prevails, points to an exterior influence even though a phenomenon of “*convergence technique*” cannot be totally excluded.<sup>91</sup> What we must perhaps bear in mind, above all, is the very limited character of such proof in time.<sup>92</sup> Assuming it is a phenomenon of “*convergence technique*”, we are dealing with an invention which was not adopted. In the hypothesis of an influence, i.e., of borrowing from the Uruk world, considering the absence of real developments, this would ultimately be a case of “*échec de l'emprunt*”,<sup>93</sup> the reasons for which should be accounted for. However, a downside subsists, always the same: the paucity of the corpus and the limited data pertaining to technical aspects, in spite of recent discoveries.<sup>94</sup>

84. Midant-Reynes & Buchez 2019.

85. For an overview of the question, cf. Hendrickx 2001.

86. Butterlin 2018.

87. From 15 to 30 cm long for sections of 15 to 6 cm (Sauvage 1998: 111).

88. Sauvage 1998: 113.

89. Spencer 1979: 15-20. “...in order to ease the process of niche construction” (Spencer 1979: 118); at Naqada, mastaba ascribed to Neith-hotep, at Tarkhan, tombs 2050, 1060, at Saqqara, tombs 3035, 3506, 2405, at Saqqara, tombs 2405, 3070 and Giza T (Spencer 1979: 143).

90. In his summary of brick architecture in ancient Egypt, Spencer describes this module (from 17/15 x 7/5 cm, even 10 x 5 x 5 cm) as “bricks of exceptional size” (1979: 143).

91. Sauvage 1998: 113.

92. Spencer 1979.

93. To use the notion proposed by Leroi-Gourhan 1945.

94. Tomb 100 of Tell el-Farkha possibly with niched wall, dated to Naqada IIIb, Dębowska-Ludwin et al. 2010.



## Conclusions

The results of excavations carried out over the last ten years in the Valley and the Delta have led to an in-depth characterisation of the construction techniques of Predynastic communities, and raised doubts as to whether mud-brick was transferred from the Near East in a phase prior to the second half of the 4<sup>th</sup> millennium. Evidence of hand-shaped brick constructions in Upper Egypt around the middle of the millennium also highlights the possibility of a scenario based on the development of an autonomous hub of invention in this region. In fact, in Egypt there is evidence for all the elements of the process highlighted by Sauvage for the characterisation of a centre of brick invention based on the study of Near Eastern sites where brick appeared at much the same time in different places, demonstrating a trend of technical convergence linked to the beginning of architecture.<sup>95</sup> These elements are: semi-buried structures with elevations made of light materials, an intermediate phase with the use of hand-shaped bricks which sometimes bear digitised imprints, then above-ground architecture. Other regions, such as the South Caucasus in the 6<sup>th</sup> millennium, yield examples of a model of development in favour of an autonomous centre of brick invention.<sup>96</sup> In fact, as Sauvage underlines,<sup>97</sup> although diffusion models are very likely responsible for brick architecture developments around the Mediterranean Basin, the invention – fundamentally indissociable from social evolution – is likely to have appeared autonomously in different places according to social and technical contexts. However, the example of the Near East also brings to light the existence of a long period of development, before the concept of moulding appears.<sup>98</sup> If the development of the phenomenon appears to be particularly rapid in Egypt, this may mean that the documentation is truncated, as only the site of Merimde emerges for the 5<sup>th</sup> millennium. But it is undoubtedly also because this phenomenon is a part of global process of social acceleration specific to Egypt which characterises the 4<sup>th</sup> millennium, and in particular the second half. However, we must admit that the recognition of an intermediate hand-shaped brick phase is only based on data from a single site, Hierakonpolis. Moreover, there are still grey areas which only new discoveries can rectify. The potential of occupation levels buried at the base of tells in the Delta or of certain stratified sites in the Valley has, to date, barely been touched upon.

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95. Sauvage 1998, 2011.

96. Baudoin 2019.

97. Sauvage 2009.

98. Chazelles 2011.

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