

An aerial photograph of an archaeological site in a desert landscape. The site features a complex grid of rectangular structures, likely storage rooms, built with earthen or mud-brick walls. The structures are arranged in a regular pattern, with some larger rectangular enclosures and many smaller, interconnected rooms. The surrounding terrain is flat and sandy, with a clear horizon line under a pale sky. The lighting suggests a bright, sunny day, casting soft shadows that emphasize the three-dimensional nature of the ruins.

STORAGE IN ANCIENT EGYPT AND NUBIA

Earthen architecture and building techniques

ADELINE BATS & NADIA LICITRA (EDS)



This is a free offprint – as with all our publications the entire book is freely accessible on our website, and is available in print or as PDF e-book.

www.sidestone.com

STORAGE IN ANCIENT EGYPT AND NUBIA

Earthen architecture and building techniques

ADELINE BATS & NADIA LICITRA (EDS)



Orient & Méditerranée



© 2023 Individual Authors

Published by Sidestone Press, Leiden
www.sidestone.com

Layout and cover design: Sidestone Press
Front cover: The *thēsaurus* of Tebtynis in 2023. © Ifao/Mohamed Ibrahim Mohamed.

ISBN 978-94-6426-223-0 (softcover)
ISBN 978-94-6426-224-7 (hardcover)
ISBN 978-94-6426-225-4 (PDF ebook)

DOI: 10.59641/o29221ra

Contents

Acknowledgements	7
List of figures	9
List of tables	13
Contributors	15
Preface	19
Abbreviations	21
Storage buildings in ancient Egypt and Nubia. Issues and perspectives	25
Adeline Bats & Nadia Licitra	
Pits, pots and silos. Storage facilities at the Predynastic and early pharaonic settlement of Elkab	55
Wouter Claes, Stan Hendrickx & Elizabeth Hart	
Les structures circulaires de stockage à Karnak aux XII^e et XIII^e dynasties	69
Marie Millet	
Le bâtiment BAT 603 de Kôm el-Nogous/Plinthine : un édifice de stockage polyvalent de l'époque saïto-perse ?	83
Bérangère Redon	
Le <i>thésauros</i> ptolémaïque de Tebtynis (Fayoum)	97
Gisèle Hadji-Minaglou	
Un <i>thésauros</i> à Bouto. Architecture et organisation d'un bâtiment de stockage dans le Delta nord-occidental à l'époque impériale	107
Loïc Mazou	
Variabilité des dispositifs de stockage en Afrique de l'Ouest : approches ethnoarchéologiques	117
Anne Mayor & Thomas Pelmoine	

Intérêts croisés des échanges transdisciplinaires entre architecture, archéologie et développement durable	141
David Gandreau, Thierry Joffroy, Philippe Garnier, Nuria Sanchez Muñoz, Majid Hajmirbaba & Mauricio Corba Barreto	
The Egyptian mud-brick silo. Technical and functional analysis of a grain storage device	151
Adeline Bats, Nadia Licitra, Thierry Joffroy, Bastien Lamouroux, Aurélie Feuillas & Julie Depaux	
References	173
Chronology of ancient Egypt	191
Chronology of ancient Nubia	193
Map of ancient Egypt and Nubia	194
Abstracts	195

Pits, pots and silos

Storage facilities at the Predynastic and early pharaonic settlement of Elkab

Wouter Claes, Stan Hendrickx & Elizabeth Hart

Elkab, Predynastic, Early Dynastic, Old Kingdom, household and public storage
Elkab, prédynastique, époque Thinite, Ancien Empire, stockage privé et publique

The activities that took place within a settlement, and their associated archaeological remains, can provide important insights regarding the social structure, organisation, and dynamics within a community (HASTORF 2017, pp. 107-109, with further references). Storage practices in particular, can provide understanding about daily life and also larger economic and social organisation. The settlement site of Elkab is an important case study in ancient Egyptian storage practices because a range of types of storage installations has been found, covering a long time span from the Predynastic Period through the Old Kingdom. As there was significant political change over this same timespan, the storage remains from Elkab can help us understand the associated economic changes and the role they played in households and communities.

The site of Elkab lies on the east bank of the Nile floodplain in Upper Egypt. Its strategic location close to the river and in the mouth of the Wadi Hellal, as well as the presence of natural mineral resources such as natron, added to the already existing religious importance of the site as the home realm of the vulture goddess Nekhbet, the tutelary deity of Upper Egypt and divine protectress of the pharaoh. Over the past decade, the settlement area of the site has been the main focus of the archaeological investigations that the Belgian mission of the Royal Museums of Art and History (Brussels) has conducted at Elkab since 1937. As was the case for many settlements throughout the Egyptian Nile Valley, the continued development of these habitation activities formed an impressive tell that must have dominated the site and testified to the significance of Elkab as an important provincial urban centre (CLAES 2019, p. 18). On the basis of various sources, we know that this mound was still preserved to a height of ~30 m in the early 19th century (CLAES, HENDRICKX 2021). The extraction of *sebakh* by the local Egyptian population, which took place at an almost industrial scale from the mid-19th century onwards, resulted in the complete or partial destruction of many tell sites in the Egyptian Nile Valley and it is estimated that more than 50 percent of such sites are now lost (MOELLER 2016, p. 53). Few other sites in the Egyptian Nile Valley were affected more severely by the devastating effects of *sebakh* digging than Elkab and today, of this once impressive tell, only a heavily disturbed area remains, covered with small craters filled with scatters of pottery sherds and other town debris. Somers Clarke identified the “probable site of the old town” in the early 20th century (SAYCE, CLARKE 1905,



Figure 1. Map of the settlement area of Elkab with the location of the TP different trenches and test pits. © Belgian Archaeological Mission to Elkab.

fig. 2). A number of small test pits excavated by Somers Clarke and his colleagues and larger excavations by the Belgian mission in the 1930's and 1950's (see *infra*) indeed revealed the presence of settlement remains, but these finds were never associated with the now lost tell. It was only in 2009, when renewed attention was paid to the settlement area of Elkab, that it was firmly demonstrated

that this tell was not entirely destroyed but that instead, its lower levels were still preserved *in situ*. As it stands, the archaeological excavations, combined with the results of geomorphological research, indicate that this habitation originated in the Badarian Period (CLAES *et al.* 2014, pp. 77, 83-84) and remained continuously inhabited, developing from a small prehistoric hamlet into a pharaonic urban

centre.¹ While the Predynastic habitation was spatially restricted to an aeolian sand dune, it seems that from the Ist Dynasty onwards, the settlement expanded into the floodplain and rapidly developed and extended over an area of several hectares (CLAES *et al.* 2014, p. 86).

During these recent but also earlier excavations, different storage installations were uncovered in nearly every excavated area within the settlement (fig. 1), ranging from simple small pits and portable containers to a large storage facility that seems to surpass domestic or mere household purposes and instead may have functioned under control of the central or provincial administration. In this paper, we will present an overview of the different storage facilities that so far were identified at the site and how their use developed over time. Although the excavated area at Elkab is still extremely limited compared to the presumed extent of the actual settlement, the storage facilities that have so far been discovered allow us to gain a better insight into its domestic organisation and its socio-economic position within the settlement system of the early pharaonic state.

Storage pits

Influenced by the changing climatological and environmental conditions at the onset of the 5th millennium BCE, the subsistence strategies of Nile Valley foragers rapidly shifted towards farming and livestock (RIEMER *et al.* 2013, pp. 181-182). Subsequently, storage became increasingly important (WETTERSTROM 1993, pp. 201-226) and nearly every settlement site has yielded archaeological remains that can be linked with storage. One such form of storage is pits. Pits have been frequently found in a variety of different sizes, shapes, and methods of construction at Predynastic habitation sites (TRISTANT 2004, pp. 102-108). Although their function may not always be clear, such pits have served a range of different storage purposes, including storing food provisions or holding ceramic containers, baskets, or storage jars (DACHY 2014, pp. 34-35).

So far, the oldest structures that can tentatively be linked with storage at Elkab date back to the Predynastic Period and concern two mud-lined pits (table 1). A first one (TP3-Lc06; fig. 2, top) was found within the aeolian sand dune on which the Predynastic settlement developed and can be dated on the basis of the associated ceramic evidence to the Naqada IIC period. It was preserved to a depth of about 35 cm, has a diameter that ranges between 38 cm (top) and 24 cm (bottom), and can roughly be described as a circular funnel-shaped pit. The thickness of the mud-lining varies between 4 and 14 cm. However, given the limited size of the test soundings (2 x 2 m),

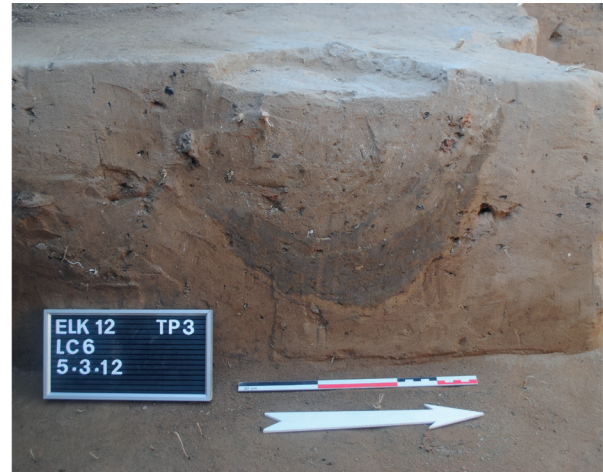


Figure 2. Predynastic storage pits: pit TP3-Lc06 (top) and pit TP9-Lc18 (bottom). © Belgian Archaeological Mission to Elkab.

its identification as a storage pit is far from certain. Moreover, the fill of the pit consisted of sand and only contained a few potsherds and flints. No botanical or other remains were found that allow us to determine a more conclusive function for this feature. Mud-lined pits could indeed have served a multitude of purposes and their function is not straightforward (MIDANT-REYNES 1998, p. 74). At the site of Adaima, for instance, mud-lined pits of similar shape and dimensions as TP3-Lc06 are identified as post holes (*'calages en limon'*, see MIDANT-REYNES, BUCHEZ 2002, pp. 43-46). Another mud-lined pit (TP9-Lc18; fig. 2, bottom) is of slightly younger date (Naqada IID-IIIa). It has an irregular circular shape with a diameter that varies between 1 and 1.20 m but was only preserved to a depth of about 10 cm. The mud-lining was between 8 and 14 cm thick and slightly sloping in towards the bottom of the pit where the mud was only around 2-3 cm thick. The fill of the pit contained a mixture of aeolian sand, small chunks of mud and charcoal as well as potsherds and flint artefacts. A limestone dome-shaped spindle whorl was found at the bottom of the pit and a typical wavy-handled cylindrical jar at a slightly higher level. Whether or not, the latter jar belongs to the fill of the pit is not clear.

1 Previous reports (see e.g., CLAES *et al.* 2019, p. 30 and n. 4) state that the most recent occupation phase dates to the VIth Dynasty. During our excavation season in the spring of 2022, *in situ* settlement remains were found in the southwestern part of the site that date to the late First Intermediate Period/early Middle Kingdom.

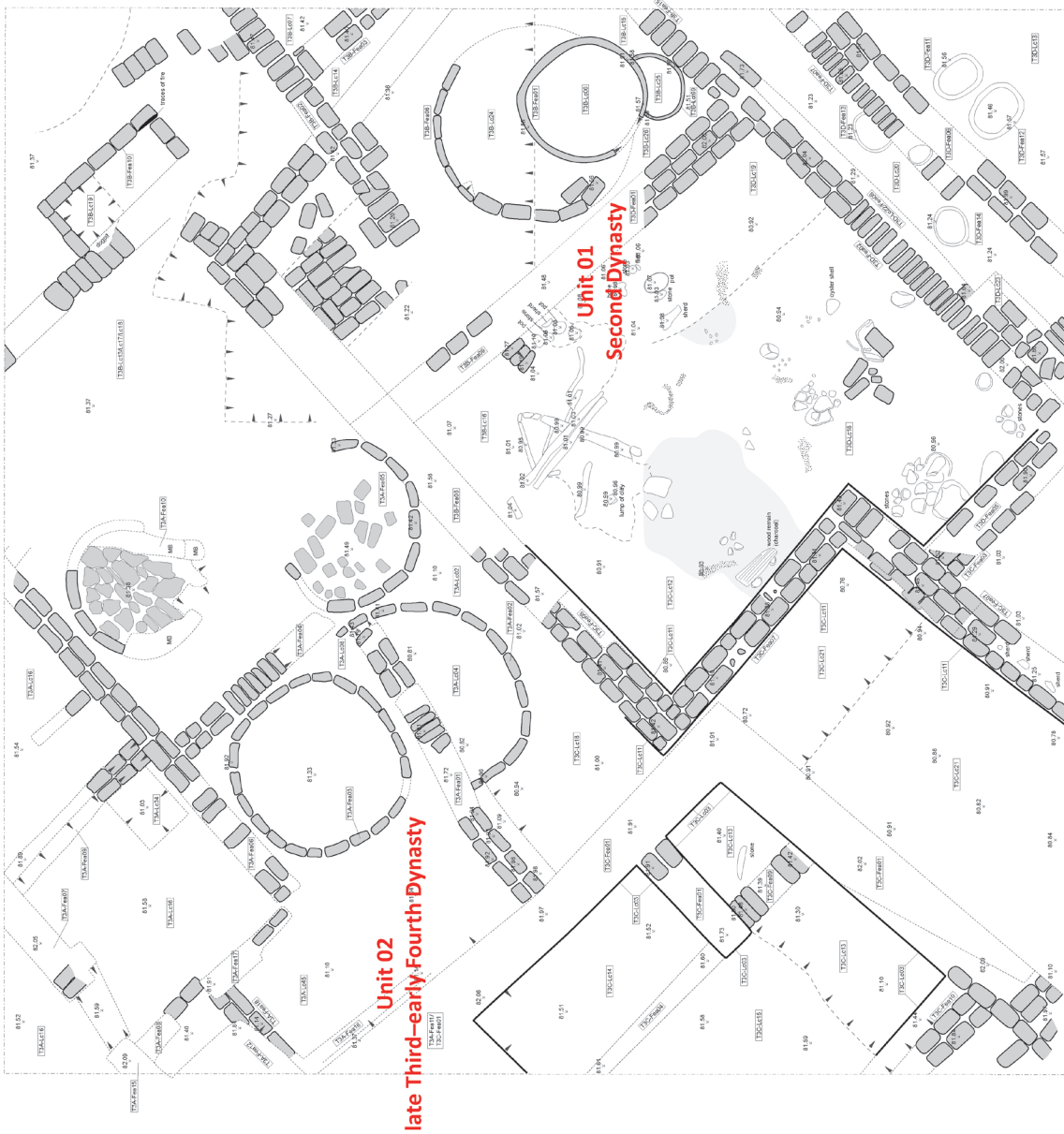


Figure 3. Map of trenches 3A – D and 6A with indication of house units 01 and 02. © Belgian Archaeological Mission to Elkab.



Figure 4. Storage pit T6A-Lc25 (right) and T6A-Lc27 (left). © Belgian Archaeological Mission to Elkab.

Several storage pits were found in trench 6A. Although heavily disturbed by a large *sebakhin* pit, this trench revealed additional rooms of a large house (Unit 01; fig. 3) that was in use from the early IInd Dynasty until at least the late IIIth/early IVth Dynasty (CLAES *et al.* 2019, pp. 5-8). A total of four mud-lined pits were found in a large rectangular space delineated on all four sides by mud-brick walls. The pits are dug into a floor level of hardened mud mixed with sand (T6A-Lc30) that based on the ceramic evidence can be dated to the first half of the IInd Dynasty.² All pits have more or less a similar ovoid shape and are coated with a thin layer of dark grey mud that varies in thickness between 2 and 4 cm. With a depth of 5 and 7 cm respectively, pits T6A-Lc21 and T6A-Lc42 are quite shallow but share an identical diameter of 20 cm. Pit T6A-Lc31 is much deeper (22 cm) but is less wide (diameter is ca. 16 cm). The largest pit

2 The occurrence of stroke-polished pottery along with bread moulds, beer jars and Marl A1 storage jars, and the conspicuous absence of Meidum bowls, allows us to assign them to the Elkab Ceramic Series 2 (CS2). See: HENDRICKX *et al.* 2016, pp. 267-272. For the time being, the Elkab pottery is mainly dated on the basis of comparisons with the pottery from Elephantine where a well-dated stratigraphic sequence is available from the Ist to the IVth Dynasties (KAISER *et al.* 1999). However, new data from Elephantine have recently been published (HOOD 2018; RAUE 2018) that will allow us to refine the chronology of the pottery sequence at Elkab.

Pit	Max. diameter (cm)	Preserved height (cm)	Mud-lining (cm)
TP3-Lc06	24-38	35	4-14
TP9-Lc18	100-120	10	2-14
T6A-Lc21	20	5	2-4
T6A-Lc42	20	7	2-4
T6A-Lc31	16	22	2-4
T6A-Lc25	35	28	2-4
T6A-Lc34	20	Not excavated	Unknown
T6A-Lc27	29	25	-

Table 1. Storage pits from the Elkab settlement.

(T6A-Lc25; fig. 4) has a diameter of ca. 35 cm and is 28 cm deep. The outline of a fifth mud-lined pit (T6A-Lc34), again with a diameter of 20 cm, was also discovered in the adjacent northern room but was not yet excavated. It is not known what was stored in these small pits. Their fill consists in all cases of grey sandy mud with some charcoal stains but were otherwise empty. The fact that they were covered with a mud-lining could indicate that they were used to store perishable commodities that needed to be protected from detrimental intrusions and infiltrations. However, it is also possible that these pits were used to store pottery jars as is illustrated by

a sixth pit (T6A-Lc27) that was found 30 cm south of T6A-Lc25. The latter one, with a depth of ca. 25 cm and a diameter of ca. 29 cm (T6A-Lc27; fig. 4), was not coated with a mud-lining but contained a complete ovoid storage jar (E16/T6A/57/1; fig. 5a) that was buried in the pit up to its shoulder. The jar (Marl A1) was decorated with a pot mark and an incised depiction of an ibex, and closed off with a potsherd that served as a stopper. The pit in which this storage jar was placed has a shape very similar to the other ones and it therefore seems likely that these other mud-lined pits were also made to hold storage jars. As an experiment, the intact storage jar was put in pit T6A-Lc25 and fitted almost perfectly.

Storage jars and storage vats

Ovoid storage jars like the one described above are found frequently in the Elkab settlement (HENDRICKX *et al.* 2016, p. 268, fig. 18). Large storage vats with a flat base are also common. The oldest example of such a vat (E15/TP6/143/1; fig. 5b) was found below the foundation of one of the rooms of house Unit 01 (trench 3, test pit 6) which was reinforced by large limestone slabs (CLAES *et al.* 2019, p. 36). This room was built almost immediately on top of the collapsed remains of a large mud-brick wall of an earlier building. This wall, about 30 cm thick, crushed this large unrestricted storage vat, made of Nile C clay that was standing on the floor of the room. This vat has a diameter of 61.8 cm and a preserved height of 51.4 cm, and was associated with a small fireplace (TP6-Lc05) in which the remains of a typical Ist Dynasty bread tray (E15/TP6/146/1; fig. 5c) were found. Radiocarbon dating confirmed the Ist Dynasty date of this occupation level. The association between the vat and the fireplace/bread tray is interesting and could indicate that the vat was indeed used in the production cycle of bread making (FALTINGS 1998, p. 37), possibly for the storage of grain as the small base of the vat makes it less suitable for the preparation of dough. However, since no lid or other traces were found which indicates that the vat could be closed off, the latter function cannot be ruled out.

At least three more or less similar vats were found in a small room of the same IInd Dynasty building. One was found *in situ* in its southern corner and was almost completely intact (E16/T3B/69/1; fig. 5d³ and 6). It was standing on a floor level on which fragments of at least two other vats were found (figs. 5e – f), all made from organic tempered Nile silt and covered with an

orange/red slip. They are a little over 50 cm high, have a maximum diameter of around 65 cm and a rim diameter that is slightly smaller. On the basis of these dimensions, they could contain about 120 litres of grain. Within this room, no other domestic installations were found in direct association with these vats. Moreover, they show no traces of soot which seemingly indicates that they were used for storage instead of other household activities such as for example the preparation of food. However, the large aperture of these vats suggests or implies that they were not used for long-term storage but rather served direct household purposes.

The installation of these vats seems to represent the second of at least four subsequent occupation phases that could be identified in this room during which its function changed from cooking to storage. Indeed, immediately below these vats an older living surface was identified that consisted of a series of small fireplaces and associated ceramic vessels, indicating that at an earlier stage, this space was used for the preparation of food. It is not clear why the function of this room changed nor what was stored in these vats, but it seems that from that moment onwards, storage remained the primary function of this specific space. Still during the IInd Dynasty, these vats were substituted by circular mud-brick silo constructions (T3B-Fea01 & T3B-Fea06; see table 2; fig. 7) of which the most recent one (T3B-Fea01) only came out of use in the late IIIrd/early IVth Dynasty. During these different phases, the room had also undergone several architectural changes. The doorway that was situated in the southern wall was filled up, while the general lay-out of the room was changed by the construction of new mud-brick walls and the abandonment of others.⁴ For the time being, it is difficult to associate these architectural changes to a specific occupation phase but the overall picture corroborates our observations from the adjacent western L-shaped room of Unit 01 that stayed in use for a long period of time, from the first half of the IInd Dynasty until at least the early IVth Dynasty (CLAES *et al.* 2019, pp. 33-36).

3 Already in the late 1960's, a more or less similar vat (K0056) was discovered in the immediate vicinity of the main temples of Elkab, together with two other large jars (K0043 & K0045). The former was buried inside a room that was paved with large potsherds. Unfortunately, its archaeological context and date are not clear (see DEMUYNCK, VERMEERSCH 1978, pp. 135-144, fig. 58).

4 The adjacent eastern room also contained several non-diagnostic CS2 pottery sherds, covered with an orange slip (E16/T6A/66, E16/T6A/108 & E16/T6A/140), most probably belonging to similar large storage vats, of which one was found immediately below a mud-brick wall (T6A-Lc41).

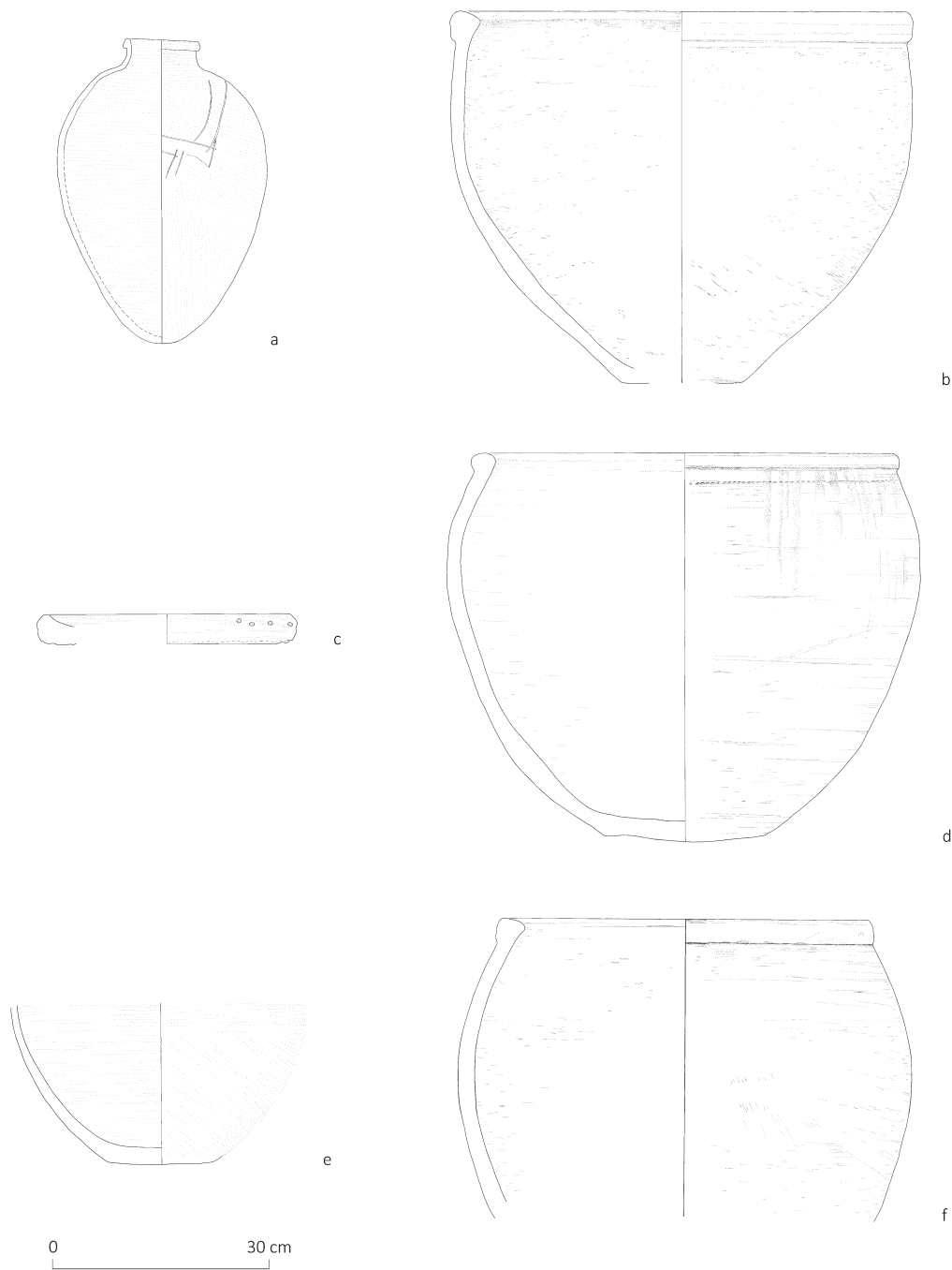


Figure 5. a) E16/T6A/57/1: ovoid storage jar from pit T6A-Lc27; b) E15/TP6/143/1: storage vat from First Dynasty level; c) E15/TP6/143/1: bread tray from First Dynasty level; d) E15/T3B/69/1: storage vat; e) E16/T3B/80/4: storage vat; f) E16/T3B/80/5: storage vat. © Belgian Archaeological Mission to ElKab.



Figure 6. *In situ* storage vat (E15/T3B/69/1) in the southern corner of the room of house Unit 01 (Second Dynasty). In the foreground, the remains of storage vats E16/T3B/80/4 and E16/T3B/80/5. © Belgian Archaeological Mission to Elkab.

Silo	Max. diameter (m)	Preserved height (cm)	Brick size (cm)
T3A-Fea02	2.00	103	26-28 x 14-16 x 8
T3A-Fea03	1.60	59	22 x 8-10 x 9-10
T3A-Fea05	1.60	Not excavated	21 x 12
T3A-Fea10	1.30	18	-
T3B-Fea01	1.30	54	22-24 x 10-14 x 8-10
T3B-Fea06	1.90	32	25 x 12-13 x 8-10
T3C-Fea05	0.70	33	-
T3D-Fea03	1.15	8	23-24 x 7 x 8
T6A-Lc01	1.48	23	25-26 x 7-8 x 5
T6A-Lc04	0.85	25	-
T6A-Lc14	0.68	11	26 x 11 x 8
TP11-Lc19	1.20	Not excavated	27 x 8-9

Table 2. Domestic silos from the Elkab settlement.

Domestic silos

Silos of different sizes have frequently been discovered within the excavated trenches and test soundings. Since the start of the excavations in the settlement area of Elkab in 2009, a total of twelve circular silos have been identified (see table 2). The vast majority of them were found in different rooms of the already discussed house Unit 01, as well as in an adjacent house (Unit 02; fig. 3) that was in use during the late IIIrd early IVth Dynasty. Finally, one silo was discovered in a small test pit (TP 11), located 20 m south of trenches T3A – D and T6A.

All silos have a circular shape and were constructed using a single row of mud-bricks, laid out as stretchers, which is also the case for the lowermost courses.⁵ The dimensions of the bricks are quite homogeneous and correspond well with the general picture of brick sizes known for the Early Dynastic Period and the Old Kingdom (J. SPENCER 1979, pl. 41). In two cases (T3A-Fea10 & T6A-Lc01), a thin layer of mud plaster of about 12 cm was applied on the inner face of the silo. An outer coating

5 In certain cases, the lowermost courses of mud-brick silos were laid as rowlocks (see BARDOŇOVÁ 2019, p. 57).



Figure 7. Silos T3B-Fea01, T3B-Fea06 and storage vat E15/T3B/69/1. © Belgian Archaeological Mission to Elkab.



Figure 8. The floor of silo T3A-Fea10 made out of irregular patches of mud. © Belgian Archaeological Mission to Elkab.

could not be identified on any of the uncovered silos. Their diameter varies between ca. 70 cm and 2 m and their preserved height between 11 cm and 1 m, which makes it difficult, if not impossible, to determine the shape of the walls of most of the silos. For only three of them, whose retained height exceeds 50 cm, it was possible to determine the shape of the walls with some degree of confidence. They proved to be straight (T3A-Fea02) or slightly inclined (T3A-Fea03 & T3B-Fea01). Whether they had a dome-shaped roof, known from tomb representations and models or from hieroglyphic signs (FLORES 2015, pp. 5-18, 75-80; BATS 2017, pp. 159-166),

cannot be stated with absolute certainty.⁶ Traces of a door or opening have not been found in any of these three silos either. There is no evidence that indicates that they were partly dug into the ground. Instead, it seems that they have been built directly on the floors of the rooms. In one case (T3A-Fea10), the floor of the silo was made of irregularly laid large patches of mud (fig. 8). In all the other cases,

⁶ This type of silo was certainly present at Elkab. A model with domed silos was found in the IVth Dynasty mastaba of Kamena (QUIBELL 1898a, p. 4, pls. II.1, VI.2; now kept in the Ashmolean Museum, Oxford, AN1896-1908 E.408).



Figure 9. View of silo T3B-Fea01. © Belgian Archaeological Mission to Elkab.

no clearly defined silo floors could be attested, although in silo T3B-Fea01, large amounts of mud-bricks were found that could be the remains of the silo floor (fig. 9). The lower part of this silo was also embedded in a 20 cm thick dark ashy layer, probably to protect the stored grain from infestation by rodents, insects, or other potential pests. This feature is quite common in the constructional lay-out of silos and attested at different sites, particularly during the Middle Kingdom.⁷ The number of silos within a single room seems to have been limited to one, and a single house unit seems to contain different rooms or spaces in which a silo was constructed. Nearly all of them were built in the corner of the rooms in which they are located. In some cases, the space between the silo and the walls of the room was deliberately filled up with a mixture of pottery sherds, fragments of mud-bricks and other debris, probably to reinforce the wall of the silo at least partly. In the case of silo T3B-Fea01, which was constructed on top of another silo (T3B-Fea06), a clear chronological distinction could be made between the pottery from the fill of the silo proper (T3B-Lc06) and the ceramic sherds found in the fill of the space between the silo and the surrounding mud-brick walls of the corner of the room (T3B-Lc23), providing evidence that this silo may have been in use for more than 50 years. Indeed, the pottery from the fill of the silo (T3B-Lc06) contains a mixture of late IInd Dynasty and early Old Kingdom pottery. The presence of, for instance, deep Meidum bowls, bowls and plates with internal rim and cylindrical

bread moulds might indicate that the silo fell out of use in the late IIIrd – early IVth Dynasty. The pottery from the latter fill (T3B-Lc23) seems to be more homogeneously of IInd Dynasty date.

In 1938 Jean Capart also discovered a total of four circular mud-brick structures during excavations in the temple complex of Elkab, located immediately east of the settlement area (fig. 1). Not much is known about these features as both the field diary and the published reports do not contain much other information besides their dimensions and the fact that they were found 2.20 m below the floor of the sanctuaries of the temple of Nekhbet (CAPART 1938, p. 203; STIENON 1938, p. 217; see also HENDRICKX, EYCKERMAN 2009, p. 2). The bricks of these *anneaux de briques* are 10 cm wide while the circular constructions themselves have a diameter of 1.75 m and a preserved height of 55 cm (fig. 10, left). No archaeological materials other than animal bones were found in the fill of these structures, which makes it impossible to attribute a proper date to them, but it is likely that they are part of a large silo complex that may have stood under the control of the provincial or central administration dating to the end of the Early Dynastic Period/beginning of the IIIrd Dynasty (see *infra*). However, it is also possible that they could be considered as simply domestic installations. Excavations by Frederick W. Green in March 1902 and by Archibald H. Sayce and Somers Clarke in January 1904 in the same area indicated that the temples of Nekhbet and Thot, which in their current state date to the New Kingdom, were built over parts of the settlement (SAYCE, CLARKE 1905, pp. 257-271, fig. 2: pits 13, 16, 18, 19, A-F, trench 11, ‘small temple’).

7 For instance, at Elephantine (VON PILGRIM 1996, p. 71), Balat/Ayn Asil (MARCHAND, SOUKIASSIAN 2010, p. 111, figs. 39-40) or Tell Hebua (ABD EL-MAKSOUH 1998, p. 115).



Figure 10. Archival photos from the excavations by Jean Capart in 1938: *anneaux de briques* discovered below the temple of Nekhbet (left) and the silos at the northwestern corner of the temple enclosure (right). © Royal Museums of Art and History, Library (inv. EGI 11475 and EGI 11529).

So far, no silo installation has been found at Elkab that predates the IInd Dynasty, but this picture is most probably biased by the very limited extent of the investigated area and the consequential limited available data related to the earlier period of occupation.

A late Early Dynastic public storage facility

In addition to the four silo installations already mentioned, during the same excavation season of 1938 Capart also discovered another series of circular mud-brick constructions, this time at the northwestern corner of the temple enclosure. According to the excavators, several of them, which they identified as silos, were framed in quadrangular mud-brick wall casings that served to reinforce the silos (CAPART 1940, p. 29; VAN DE WALLE 1954, p. 91). The space between the walls of the circular structures and their enclosing quadrangular casings yielded a number of interesting finds, including a total of sixty-nine seal impressions. As they were discovered towards the end of the excavation season, these constructions were only investigated superficially. The surviving field documentation does not provide much more information than the mere fact that they are “semblables à celles qui ont été trouvées sous les sanctuaires du grand temple mais de diamètre supérieur” (field diary, 9 March 1938) and that a sketch map was made (field diary, 12 March 1938). Unfortunately, this map is not preserved (HENDRICKX, EYCKERMAN 2009, n. 3) but two more or less similar photos have recently surfaced in the archives of the Royal Museums of Art and History that give an impression of the architectural layout of these constructions (fig. 10, right). According to the field notes, Capart clearly had the intention to continue their

excavation, but it was only in 1955 that the area received further attention. Under the direction of Capart’s successor Pierre Gilbert, excavations were resumed some five meters south of the area where the abovementioned seal impressions were found in 1938 (field diary, 20 January 1955). An area of roughly 40 x 60 m was investigated and revealed a large storage facility with several clusters of circular mud-brick constructions organised around different courtyards. Gilbert only published a handful of almost identical, very short preliminary notes (GILBERT 1955; 1955-1957; 1958; 1959) and as a result, the importance of this area for our understanding of the settlement organisation of Elkab remained largely unknown until Stan Hendrickx and Merel Eyckerman finally published an extensive report based on the original field documentation in 2009.

Between 20 January and 15 February 1955, Gilbert and his team excavated a total of fifteen circular mud-brick constructions, but it is not entirely clear if they also re-excavated the silos discovered by Capart. His 1938 field diary does not mention the precise number of silos that were uncovered at the northwestern corner of the temple enclosure. Yet, in his publications, Gilbert mentions that Capart found the base of two silos and that he excavated an additional ten, bringing the total amount of silos in that particular area to twelve (GILBERT 1958, pp. 249-250; 1959, p. 51). However, a sketch map from the 1955 field documentation shows fifteen silos (HENDRICKX, EYCKERMAN, p. 4; fig. 2) which also corroborates their labelling in the field diary with capital letters from A to O.⁸

8 The last capital letter used for labelling the silos is the letter ‘O’ (field diary, 1 February 1955).

Apart from some scanty information on the different finds that were made in association with these constructions, the field diary does not provide much other information. For instance, whether the walls of the silos were plastered is not reported, nor their dimensions (diameter, preserved height). Only the size of the mud-bricks is mentioned (25 x 12 x 7 cm) which, according to the excavators, is identical to the bricks used for the construction of the late Old Kingdom enclosure wall (or so-called Double Walls) of Elkab or the Khasekhemwy enclosure at Hierakonpolis (field diary, 9 February 1955).⁹ On the basis of the excavation photos and the sketch map respectively, Hendrickx and Eyckerman estimate that the retained height of the silos is generally less than 80 cm and that their diameters range between 1.20 and 3.55 m, although the accuracy of this map can be rightfully doubted (HENDRICKX, EYCKERMAN 2009, p. 4 and n. 5). What is clear however, is that these silos were organised in different clusters and associated with a series of rectangular mud-brick walls that seem to form different courtyards. The field diary (26 January 1955) also mentions that large amounts of charcoal were scattered in between the silos. This is an interesting observation, but on the basis of the available field documentation, it is impossible to evaluate whether this charcoal layer was intentionally laid out as a protective measure against pest infestation of the stored grain (see also *supra*).

Unfortunately, Hendrickx and Eyckerman (2009, p. 4) were only able to locate and identify three silos (A, M and N) with certainty on the sketch map and in the excavation photographs. Possibly, the abovementioned seal impressions excavated by Capart in 1938 were found near silo A which was most likely the starting point of Gilbert's excavation (see *supra*). On the basis of these seal impressions, there is little doubt that these circular mud-brick constructions are to be identified as silos. Indeed, they mention the names of individuals bearing the title 'Inspector of Elkab' (*šḥd Nḥb*) in connection to grain silos (*šnw.t*; VAN DE WALLE 1954; KAPLONY 1963, p. 172; REGULSKI 2009). A case in point for such an identification could also be a mud cone, found in silo E, which was interpreted by the excavators as the closing cone of the silo proper (field diary, 22 January 1955; see also HENDRICKX, EYCKERMAN 2009, p. 4). Unfortunately, the current whereabouts of this cone is not known, and the available field documentation does not contain a detailed description, photograph or drawing that allows us to verify this interpretation. The presence of several grinding

implements, sickle blades and bifacial knives indicates that grain may also have been processed in the immediate vicinity of these silos. The discovery of a scribal palette and a number of stone weights moreover suggests that this facility was under administrative management and control (HENDRICKX, EYCKERMAN 2009, pp. 16-18).

Gilbert dates this storage facility to the 'archaic period' (GILBERT 1955; 1958, p. 253; 1959, p. 52). In the field diary a more specific date in the Ist Dynasty is proposed (field diary 20 January 1955; 31 January 1955; see also RADEMAKERS *et al.* 2021). Based on the archaeological material found in association with the silos, Hendrickx, and Eyckerman (2009, p. 17) suggest a date in the early IIIrd Dynasty for this silo complex which correlates well with the proposed late IInd Dynasty/early IIIrd Dynasty date (reigns of Khasekhemwy and Netjerikhet) for the seal impressions as proposed by Regulski (2009, pp. 42-44).¹⁰ Whatever the exact date of this storage facility and these seal impressions may be, it is clear that these silos surpass a simple domestic level and are undeniably of public nature. Whether this 'public' character implies that they stood directly under control of the central state can be debated and their further interpretation remains difficult. Ilona Regulski, who re-examined the seal impressions, believes their presence at Elkab reflects an increasing network of officials that, under the authority of the incipient central administration, performed administrative functions in the provincial centres (REGULSKI 2009, p. 44; followed by FLORÈS 2017, p. 17 and MARTINET 2019, pp. 143-145). Other scholars, such as Leslie Anne Warden, believe that this storage complex and its potentially associated grain processing facility functioned as a central hub for grain storage independent from the central state. The absence of royal names in the corpus of seal impressions and their local character are in her opinion decisive arguments to define the administration of these silos as being solely governed by the local authorities (WARDEN 2017, p. 144). There are indeed several arguments in favour of such an interpretation, however, the specific layout, size, and associated finds of the Elkab public silos only have parallels in archaeological contexts that are strongly linked to state-controlled economies. The best example in this respect is the Royal Administrative Building at Heit el-Ghurab (LEHNER *et al.* 2009, pp. 59-65; see also HENDRICKX, EYCKERMAN 2009, p. 18; ROWLAND *et al.* 2009, p. 31, fig. 19). It is therefore tempting to state that these silos, like the ones in Giza, in combination with the seal impressions, are evidence for the presence of a state-organised economy at Elkab. Large clusters of silos have in recent years also been discovered in house contexts

9 While this is true for the Khasekhemwy enclosure (JAESCHKE 2005, p. 24), this is not the case for the bricks of the Double Walls which are in general 35 x 13 x 6 cm (HENDRICKX *et al.* 2010, p. 160). The size of the mud-bricks of these silos roughly corresponds with the different bricks sizes that were attested for the recently discovered domestic silos (see table 2).

10 Van de Walle dates the seal impressions "à une période qui se rapproche de la II^e dynastie" (VAN DE WALLE 1954, p. 98) and Kaplony to the "2. Hälfte der archaischen Zeit" (KAPLONY 1963, p. 172).

that may or may not be linked to institutional control (see WARDEN 2017, pp. 144-146; see also ROSENOW 2022 for a recent example from the settlement site north of the valley temple of Sneferu's Bent Pyramid at Dahshur) illustrating the complex character of grain storage in late Early Dynastic/Old Kingdom Egypt.

Conclusions

The new excavations in the settlement of Elkab have revealed a number of different storage constructions that are both permanent and moveable. The oldest evidence so far encountered dates to the Middle Predynastic and consists of two mud lined storage pits. The use of such pits continues well into the Dynastic phases of the expanding settlement. From the 1st Dynasty onwards, large storage vats also appear in the archaeological record of the Elkab settlement. In one case, such a vat seems to have been clearly used within the context of bread making while in another case several vats were clustered in one single room of a larger building. All these constructions, along with a number of circular silos, should be interpreted as domestic storage installations within the context of single households. The large public storage facility discovered in 1955, is of a completely different nature, and seems to have been administered either locally or by the central state. In any case, the silos at Elkab show the economic importance and complexity of storage both on the level

of individual households and collective identities. The seal impressions that were found in the public storage facility also illustrate the political and economic changes and transitions that were taking place at the end of Early Dynastic Period and the onset of the Old Kingdom.

Acknowledgements

Funding for the excavations in the settlement area of Elkab was provided by the Belgian Ministry of Science Policy (Grant MO/38/020), the Egyptology Endowment Fund of Yale University, the Gerda Henkel Stiftung (Grant AZ20/F/14) and the National Geographic Society (Grant GEFNE173-16). In addition, the Belgian embassy in Cairo, the Netherlands-Flemish Institute in Cairo and Vodafone Egypt offered administrative and logistical support. We thank all the members of the Elkab mission for their most efficient assistance during the various excavation seasons, our crew of Egyptian workmen and house staff. Our thanks are also due to the Egyptian Ministry of Antiquities, in particular his Excellency Dr. Khaled El-Enany (former Minister of Tourism and Antiquities), Dr. Nashwa Gabr (General Director of Foreign Missions Affairs), Dr. Said Abdel Moneim (Chief Inspector, Aswan Inspectorate) and Mr. Osama Ismail Ahmed (General Director, Edfu Inspectorate). The pottery (fig. 5) was drawn and inked by Merel Eyckerman, Layla Mesotten and Loesje Ulenaers.

