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Investigating the Nile Delta's First Settlements: Excavations at Tell el-Samara 2016-2019*

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ABSTRACT

This article provides an overview of the first results from the archaeological fieldwork conducted at Tell el-Samara by a joint IFAO and Egyptian Ministry of Tourism and Antiquities mission. Located in the eastern Nile Delta, Tell el-Samara was a settlement inhabited from the late 5th millennium BCE to the end of the Early Dynastic period. The renewed archaeological investigations on the tell have uncovered the remains of one of the most ancient villages known so far in Egypt—providing detailed insights into the onset of Neolithic economy and sedentary village life in Lower Egypt. They have also revealed a continuous occupation sequence from the Neolithic period to the advent of the 1st Dynasty, which provides relevant data on the emergence and further development of a regional culture in the Nile Delta prior to the rise of a monarchy and the political unification of Egypt at the turn of the fourth and 3rd millennium BCE.

Keywords: Egyptian Prehistory, Nile Delta, settlement archaeology, Neolithic period, subsistence activities, domesticates, Lower Egyptian material culture.

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RÉSUMÉ

Cet article présente les premiers résultats des fouilles conduites à Tell el-Samara par une équipe conjointe de l'Ifao et du Ministère égyptien du tourisme et des antiquités. Situé dans l'est du Delta, Tell el-Samara est un village qui fut occupé de la seconde moitié du V^e millénaire av. J.-C. à la II^e dynastie. La reprise des travaux archéologiques sur le tell a permis de mettre au jour les vestiges d'un des plus anciens villages connus à ce jour en Égypte. Elle a également mis en évidence une séquence d'occupation continue, de la période néolithique à l'avènement de la I^{re} dynastie, livrant ainsi d'importantes informations sur l'émergence et l'essor d'une culture régionale propre au Delta avant l'apparition d'une monarchie et l'unification politique de l'Égypte au tournant des IV^e et III^e millénaires av. J.-C.

Mots-clés : Préhistoire de l'Égypte, Delta du Nil, archéologie domestique, période néolithique, économies de subsistance, premiers animaux domestiques, culture matérielle de Basse Égypte.



THE PAST 40 years have seen a significant development in archaeological fieldwork in the Nile Delta gradually unveiling the long history of a region poorly documented hitherto in the archaeological record. Concomitantly, an increasing number of scientific programmes focused on the process of State formation in Egypt through adopting a multi-scale approach to explore the economic and social dynamic that resulted in the advent of a differentiated society and ultimately led to the rise of a monarchy at the turn of the 4th and 3rd millennium BCE. As a result of the recent academic research it is now possible to provide a more comprehensive assessment of the cultural evolution of the Lower Egyptian populations throughout the 4th millennium BCE from the onset of a distinctive regional culture c. 4000 BCE until the political unification of the two lands c. 3000 BCE. The early stages of this formative period, however, remain little known, for thus far only a handful of archaeological sites dated to the 5th millennium BCE have been excavated in Lower Egypt.¹ In this respect, the recent excavations at Tell el-Samara in the north-eastern part of the Nile Delta under a joint research programme of the French Institute for Oriental Archaeology in Cairo (IFAO) and the Egyptian Ministry of Tourism and Antiquities (MoTA) provided new information by unearthing one of the oldest settlements known to date in Egypt. The present paper covers fieldwork conducted on the tell over three seasons of archaeological excavations between 2016 and 2019. Through the description of the salient features of the material and architectural remains uncovered at Tell el-Samara it aims to stress the site's great potential for archaeological research on the spread of the Neolithic economy into Egypt and on the onset of sedentary village life.²

¹ The only 5th millennium BCE settlement discovered so far in the alluvial plains of the Nile Delta is Sais (WILSON et al. 2014). Two others were located on the less humid margins of the Nile Delta at Merimde Beni-Salama (EIWANGER 1988) and el-Omari (DEBONO, MORTENSEN 1990). Clusters of smaller sites are documented in the Fayum (CATON-THOMPSON, GARDNER 1934; HOLDAWAY, WENDRICH 2017) and in the surroundings of Badari in Upper Egypt (BRUNTON, CATON-THOMPSON 1928).

² Substantial discussion on the Neolithic period and the spread of Neolithic economy into Egypt is beyond the scope of the present excavation report. For detailed discussions on these issues we refer the readers to: BARICH 2021; CAPPERS 2013; CAPPERS, NEEF 2012; LINSELE et al. 2014; RIEMER, LANGE, KINDERMANN 2013; ROWLAND, BERTINI 2016; WETTERSTROM 1993.



FIG. 1. Area 1a at the end of the 2019 season, view to the west.

1. THE PREHISTORIC SETTLEMENT AT TELL EL-SAMARA (C. 4500–3000 BCE): CONTEXT AND STRATIGRAPHY

Tell el-Samara is located in the Daqahliya governorate, 25 km south-east of al-Mansura. The tell borders on the Samara village to the east and its preserved part, rising between 2 m and 5 m above the surrounding fields, covers about 6 ha (Figs. 1–2). A modern Islamic cemetery occupies the north of the tell and prevents any excavations in this area. Evidence for a prehistoric occupation at Tell el-Samara was first reported through a survey of the Munich East Delta Expedition in 1982.³ Not long after, auger drills made by the American team working at Mendes confirmed that Tell el-Samara was already inhabited in the late 4th millennium BCE.⁴ The first fieldwork conducted on the site was conducted in 1998–2002 by MoTA under the direction of Salem el-Baghdadi. The excavations, conducted over 7,200 sqm in the south-eastern part of the tell, revealed an extensive cemetery comprising more than 85 Early Dynastic burials (Fig. 2b: area a).⁵ In 2010 an additional season led by MoTA under the direction of Hamdy Ahmed Mashaly further explored the cemetery: two trial trenches were opened at the western limit of the former

³ KRZYZANIAK 1989, pp. 271–277.

⁴ BREWER et al. 1996, p. 39.

⁵ EL-BAGHDADI 2007, pp. 494–495, Figs. 4, 5a–5c; EL-BAGHDADI 2008, p. 1155.

excavations to test how far the burial ground extended in this direction (Fig. 2b: areas b). In addition, a larger excavation sector opened in the west of the tell uncovered several phases of superimposed mudbrick buildings dated to the late 4th-early 3rd millennium BCE (Fig. 2b: area c). Given the relevance of the archaeological remains found at Tell el-Samara for the study of socio-economic changes and cultural transitions occurring in the Nile Delta prior to the advent of the Pharaonic State, resuming the work at the site was highly advisable. IFAO conducted a short test season in December 2015 to assess the practicability and potential scientific outcomes of a new archaeological mission on the site. The clearing of some of the squares previously excavated in 2010 rapidly provided information regarding the chronology, stratigraphy, and thickness of successive occupation layers in the central part of the tell. The virgin sand upon which the first village was built was reached 2 m below the topsoil. The clearing also revealed that the prehistoric remains, about 1.3 m thick, were all located above the water table (Fig. 5: section 1 Sq. I4). Although previously unreported, several occupation layers predating the mid-4th millennium BCE were also found. Owing to the high potential of Tell el-Samara for a better understanding of the Nile Delta's late Prehistory, it was therefore decided to pursue fieldwork on the site under a joint Franco-Egyptian mission (IFAO-MoTA). Three excavation seasons were conducted between December 2016 and March 2019, the results of which are presented in this paper.⁶

The first excavation season (December 2016–March 2017) aimed at ascertaining the complete stratigraphic sequence of the tell and determining the chronological position of the burials previously excavated by MoTA in 1998–2002. A new excavation sector (area 1a) was opened at the limits of the former excavations so as to overlap them partially in order to keep stratigraphic connections between MoTA excavations and the newly discovered remains. Delineated according to a north-south oriented grid, area 1a intersected MoTA excavations at a 45° angle (Fig. 2b). It extends over 550 sqm divided into 20 squares (5 × 5 m) plus two more squares at the junction with the 2010 MoTA excavations in its south-eastern part. An additional four-square sector (area 1b) was opened not far from the north-eastern corner of area 1a with the aim of checking the stratigraphic sequence between the Early Dynastic burials and some nearby mudbrick buildings mentioned in MoTA reports. As expected, area 1b partly intersected the former fieldwork allowing these stratigraphic connections to be studied through the sections (Fig. 3). A third sector (area 2) was excavated near the western border of the tell to explore further the mudbrick buildings previously found in this area and assess their contemporaneity with those uncovered in the cemetery. Lastly, area 3 was opened in the east of the tell at MoTA's request to document the archaeological remains before the construction of a public building. Excavations in this area could not be completed for lack of time and

⁶ The members of the Tell el-Samara mission from 2016 to 2019 were: Muhammad Ahmed Abdel Azim (MoTA), Hamdy Ahmed Mashaly (MoTA), Muhammad Gaber (IFAO), Frédéric Guyot (IFAO), Christiane Hochstrasser-Petit, Joséphine Lesur (MNHN), Nehal Mahmoud Muhammad (MoTA), Béatrix Midant-Reynes (CNRS), Radwa Muhammad (Ain Shams University), Rafat Muhammad, Sherouk Shehada (Helwan University), Yehya Zidan (Fayoum University). Fieldwork, topographical survey and pottery study were carried out by F. Guyot assisted by our Egyptian colleagues. The study of faunal remains was conducted by J. Lesur, while B. Midant-Reynes was in charge of the stone implements. The drawings have been made by C. Hochstrasser-Petit in addition to a myriad of small, but priceless, little things. Rais R. Muhammad led the workers from the Samara village.

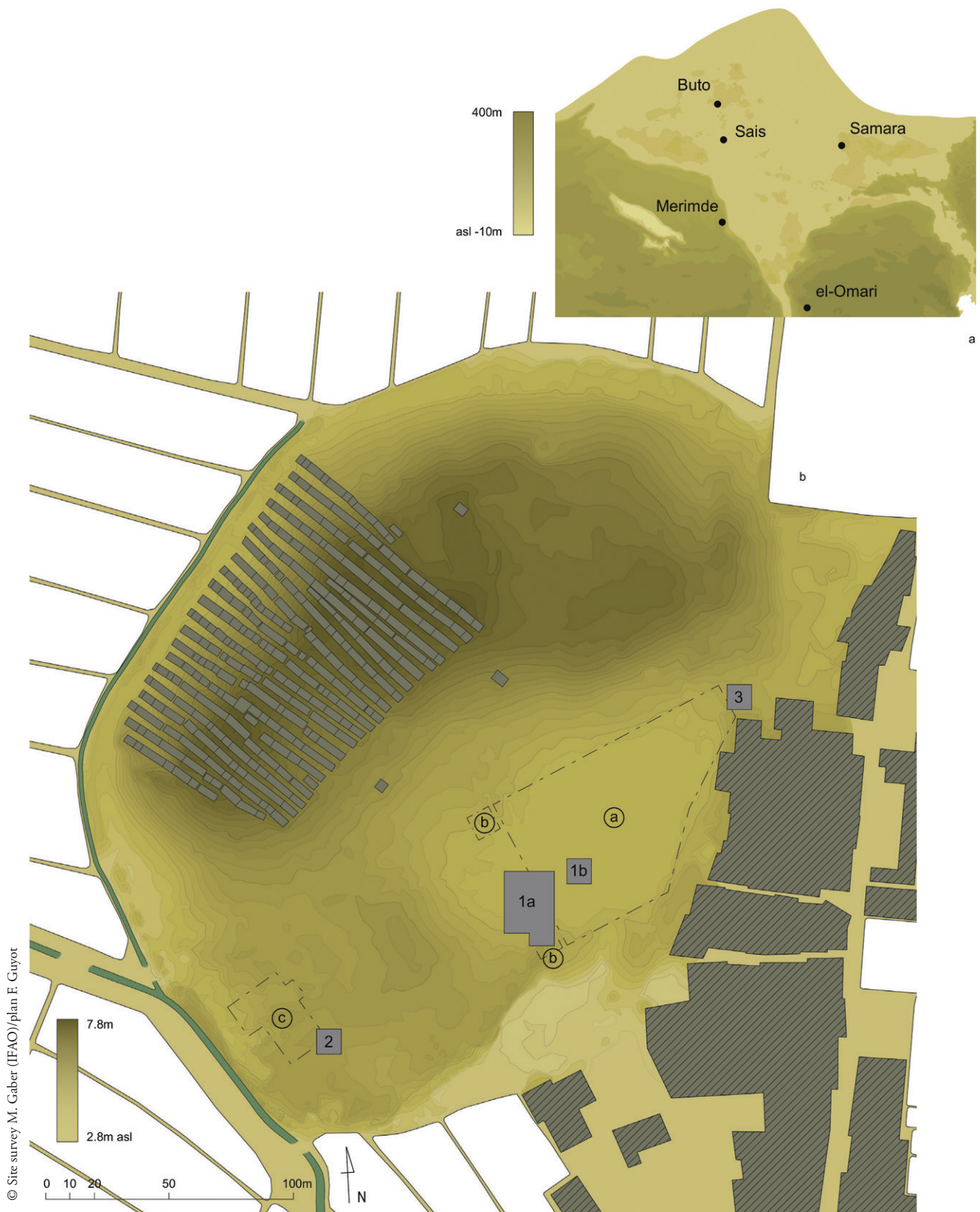


FIG. 2. Location of the tell (a) and main excavated areas (b) (map of the Nile Delta after Pennington et al. 2017, fig. 12).



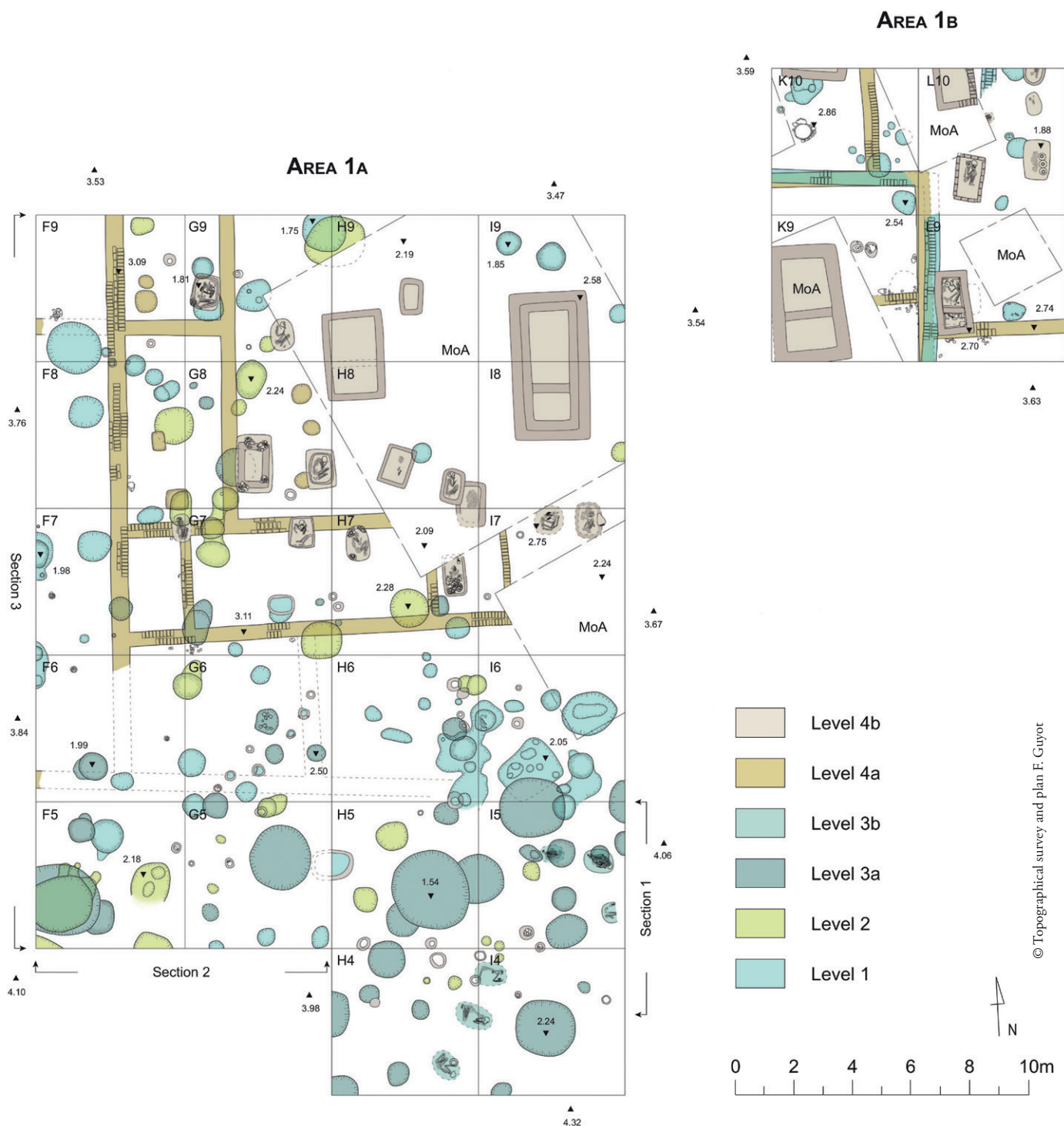
FIG. 3. Area 1b at the end of the 2017 season, view to the north.

the work in area 2 is still underway. Accordingly, the results from area 1a and 1b only will be presented here.

During the second season (February–March 2018) fieldwork focused mainly on area 1a. Excavations were extended over the entire area and revealed, in its northern part, a large mudbrick building dated to the late 4th millennium BCE. In the south of area 1 occupation layers dated to the late 5th millennium BCE were reached just above the virgin sand. During the third season (February–March 2019) the mudbrick building was removed in order to reach the earliest occupation all over area 1a. Although some work remains to be done to complete the clearing of the first occupation of the tell, it can be considered that the bulk of archaeological remains located in area 1a-b were unearthed at the end of the third season (hereafter, area 1 will refer to both area 1a and 1b unless explicitly mentioned). The present report can therefore be considered as a nearly exhaustive description of the occupation levels in the central part of the tell.

1.1. Occupation levels

Four main occupation levels ranging from the late fifth to the turn of the fourth and 3rd millennium BCE have been identified (Figs. 4–6). The following section provides an overview of the stratigraphic sequence, while the chronological framework and archaeological remains from each level will be further discussed below.



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FIG. 4. Areas 1a and 1b, main excavated remains by level.

Level 1 (c. 4500–4000 BCE): Tell el-Samara's first settlement consisted of ephemeral dwellings made of reeds, wood, and twigs covered with clay, around which pits and silos for storing cereals were dug. Like nearly all the prehistoric settlements in the Nile Delta, Tell el-Samara

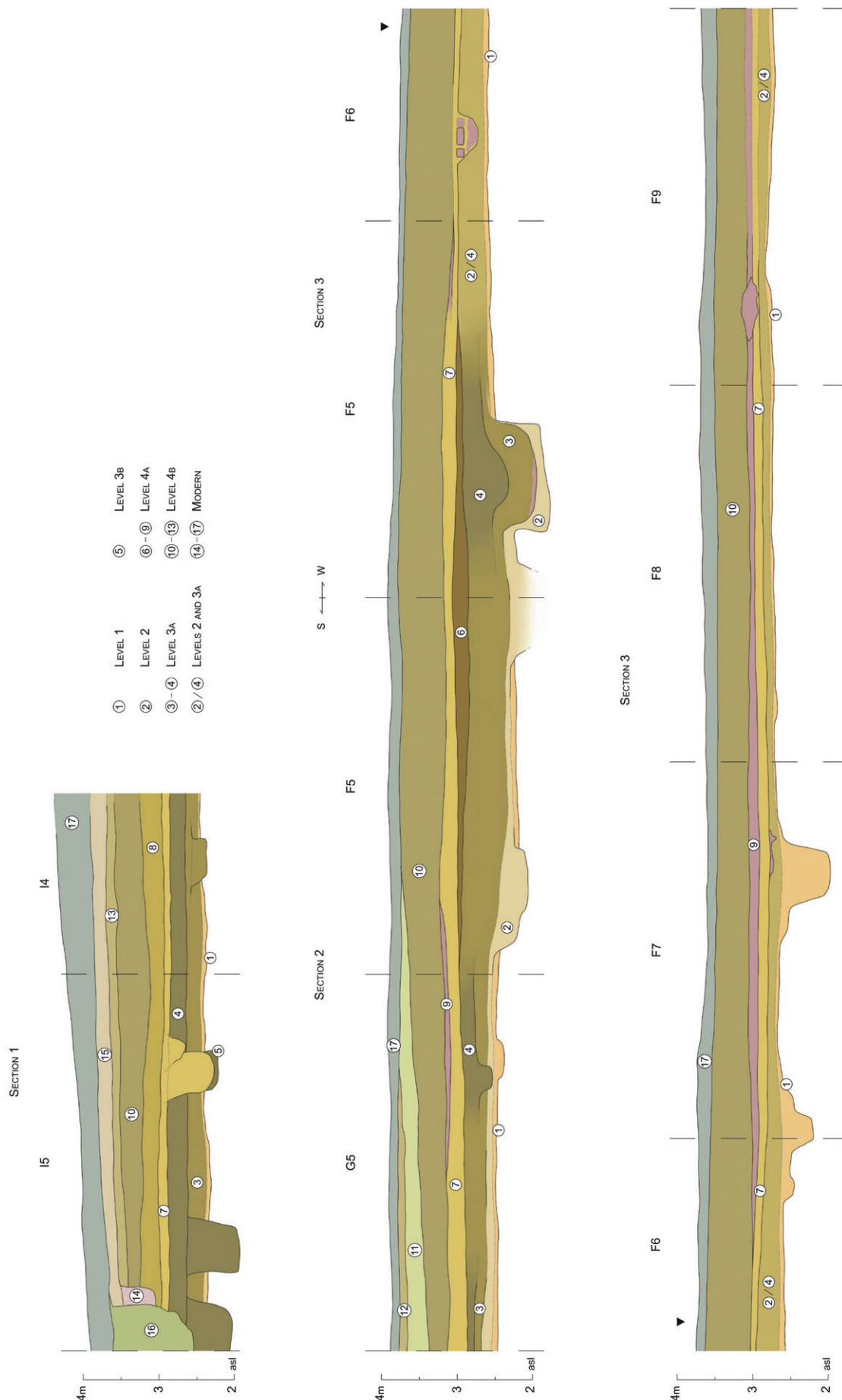


Fig. 5. Sections from area 1a (see Fig. 4 for location).

was initially settled on the upper slopes of a sandy hill protruding above the alluvial plain (also known as “*gezira*” after the Arabic word for island and often referred to as “turtle backs” in geological studies).⁷ Such a location kept the settlement out of reach of the annual inundation but as close as possible to the flood basins, so the latter could be cultivated more easily after the flood receded. The extent of this first village is difficult to infer from the limited area excavated so far.⁸ However, the thickness of the deposits relating to Level 1 did not exceed 15 cm—suggesting that the early settlement was a loose occupation with scattered ephemeral buildings rather than a densely inhabited village (Fig. 5: layer 1). The materiel culture from this level (i.e. pottery and stone implements) was closely related to the assemblages from Merimde and el-Omari (see below).

Level 2 (c. 4000–3600 BCE): Remains from Level 2 were elusive for they have been heavily deflated by later occupation in the mid-4th millennium BCE. In area 1a, they amount to no more than thin patches of occupation layers, some silos and pits containing few archaeological finds (Fig. 5: layer 2). Residual artefacts from this level were also found in area 1b without it being possible to relate them to any architectural remains. Both ceramic repertoire and flint industry witness a slow pace of development in the material culture, which allows for a distinction between this second level of occupation and the previous one, although data are lacking for evidencing a marked change in the settlement pattern.

Level 3 (c. 3600–3300 BCE): The archaeological deposits from Level 3 are significantly thicker than those from Levels 1–2, and can reach 60 cm in depth in the southern part of area 1a (Fig. 5: layers 3–4). The settlement still consisted of ephemeral architecture with long, narrow trenches evidencing the existence of large rectangular buildings most likely made of reeds or wattle-and-daub. Silos and extensive pits, transformed into refuse areas after going out of use, yielded vast amounts of food-producing waste documenting the various subsistence strategies of local communities at that time. The ceramic and lithic assemblages from Level 3 were typical of Lower Egyptian material culture, which is now well-documented in many mid-4th millennium BCE sites throughout the Nile Delta. At the end of the period, a group of graves were dug in the south-eastern part of area 1a. Intersecting former pits, silos and trenches, these tombs were distinctly later than the third occupation of the tell. Consequently, two sub-phases can be differentiated within Level 3: a settlement (Level 3a), followed by a burial ground (Level 3b).

⁷ PENNINGTON et al. 2017, pp. 213, 218–222; HAMDAN, HASSAN 2020, p. 459. On the contrary, the settlements located on the fringe of the Nile Delta (Merimde) or at its apex (e.g. el-Omari, Maadi) were settled on rocky terraces at the edge of the desert (ROWLAND, BERTINI 2016, p. 165). Tell el-Samara was located at the western end of a large Pleistocene formation that overlooked the eastern floodplains of the Nile Delta at that time (Fig. 2a). It is noteworthy that the prehistoric sites known to date in this part of the Nile Delta were all located on the same formation (HENDRICKX, VAN DEN BRINK 2002, p. 366). The settlement from the early 4th millennium BCE at Buto was settled on a similar formation but in the northern Nile Delta.

⁸ Remains from Level 1 have been reached solely in area 1a and 1b: excavations in area 3 had to be stopped before reaching this level, while excavations in area 2 focused on Levels 4a–4b during the 2016–2019 seasons (see below). One of the test trenches opened by MoTA in 2010 was located in the south-eastern corner of area 1a (Fig. 2b). Excavations were conducted there down to the virgin sand of the *gezira* about 2.5 m below the top soil, and even a bit deeper in some places. After clearing the former trench in 2016, the decision was made to rectify its baulks in order to align them with the grid and study their sections (which led to the creation of Sq. H4 and I4). It was also decided to level the entire area previously excavated in order to get an even surface for observing the stratigraphy more clearly. This explains why the elevation of Sq. H5–I5 are 20–30 cm lower than the elevation reached in the adjacent squares at the end of the last season (which is especially visible on Figs. 18, 27). This levelling also allowed us to check that there were no remains or artefacts below the top of the *gezira* (i.e. covered by aeolian sand deposits).



FIG. 6. Section 1 at the end of the 2018 season.

Level 4 (c. 3300–2900 BCE): Drastic changes occurred in the layout of the village during the last third of the 4th millennium BCE owing to the emergence of mudbrick architecture. Large buildings containing several rooms were built in many places all over the tell. The extent of the built-up area over the slopes of the *gezira* is still difficult to estimate, although the settlement seems to have been considerably more developed and densely occupied than in the former levels. Parts of extensive mudbrick buildings have been uncovered in every excavated area; in area 1a, thick walls delineated rectangular rooms and associated courtyard, which continued toward the north-east beyond the excavated area (Fig. 4).⁹ Marked changes occurred in the material culture as well. Pottery, stone implements and, more broadly, the whole means of production underwent a swift evolution and became fairly similar to those developing in Upper Egypt at the same time.¹⁰ Shortly after the abandonment of the buildings, the central part of the tell was used as a cemetery. Early Dynastic tombs, related to the same burial ground as those excavated by MoTA, were dug into the abandonment layers covering area 1b and in

⁹ The living floors associated with the building were about 15–25 cm thick (Fig. 5, layer 7). They were covered by a series of destruction and abandonment layers in which no structure has been found but a vast amount of artefacts. The stratigraphic connections between the upper layers in section 1 (east) and those in sections 2–3 (south and west) have been heavily disrupted by MoTA excavations in 2002 and 2010 (Fig. 4, respectively Sq. H8–I9 and Sq. H4–I4). For this reason, the labelling of the upper layers from Level 4a is not continuous between the eastern and western sections. Layer 8 in particular is quite visible in section 1 (Figs. 5–6), yet its connection with section 2, where layer 10 was directly superimposed above layer 7, was not possible to establish with certainty. Despite these limitations, the following sequence can be proposed: occupation of the mudbrick building (layers 7–8), destruction of the building (silty layer 9), abandonment followed by a loose occupation of the area during the Early Dynastic period (layer 10).

¹⁰ See for instance JUCHA, MAĆZYŃSKA 2011, pp. 39–43.

the northern part of area 1a.¹¹ In every location, they intersected former mudbrick architecture, which allows two sub-phases to be distinguished within Level 4: a settlement occupied not long before the advent of the 1st Dynasty (Level 4a), then an Early Dynastic cemetery adjoining a large empty space without architectural remains (Level 4b). A handful of pottery sherds, found out of context just below the topsoil in areas 1 and 2, can be dated from the late Second or early 3rd Dynasty.¹² The tell may therefore have been occupied sporadically in the early 3rd millennium BCE after the cemetery had ceased to be in use. In any event, this last occupation was limited and ended before the advent of the 4th Dynasty.

1.2. Tell el-Samara in its chrono-cultural context

Before considering the settlement of Tell el-Samara in its wider regional and cultural context, it should be stressed that a reassessment of the chronological framework customarily used in Lower Egyptian Prehistory is proposed here for referring to the successive occupation levels identified so far.¹³ The late Prehistory of Egypt is conventionally divided into two chrono-cultural phases: the Neolithic period (c. 5000–4000 BCE), and the Predynastic period (ca. 4000–3000 BCE). The latter is further divided into several sub-phases, the labelling and the time span of which vary from one region to another.¹⁴ In Upper Egypt, three sub-phases (Naqada I–III) have been inferred from the gradual changes in the pottery tradition documented primarily by funerary offerings deposited throughout the 4th millennium BCE in the many cemeteries bordering the Nile Valley. In Lower Egypt, the regional chronology is based on the stratigraphic sequence of the prehistoric settlement excavated at Buto in the northern Delta. The two initial stages of the local culture are thus commonly named after the basal levels of the eponymous site of Buto (Buto I–II). Yet the same chronological framework as in Upper Egypt is used for referring to the later stages of the Lower Egyptian culture (Naqada III). Although widely accepted, this dual chronological framework may cause biases in the interpretation of social dynamics occurring in Egypt before the turn of the 3rd millennium BCE and the rise of a monarchy: firstly, because it tends to conceal the continuity that existed in the socio-economic development of Nilotic populations between the 5th and the 4th millennia BCE by drawing an artificial distinction between what is labelled the “Neolithic” period on the one hand, and the “Predynastic” period on the other. Secondly, because it does not properly highlight the specifics of the cultural features and socio-economic changes of Lower Egyptian communities. When considering the archaeological evidence from both Lower and Upper Egypt as a whole, it appears that no major break occurred in the long-term evolution of social and economic practices between c. 4500–3500 BCE. Thus, there would not seem to be any objective grounds for considering a transition between

¹¹ In area 1, the uppermost archaeological layers have been severely levelled in modern times (see in particular Fig. 5, section 2, Sq. G5–F5). As a consequence, the layer relating to the burials has been removed. It is thus no longer possible to determine either the original elevation of their opening, or their stratigraphic connections with layers 10–13. However, the fact that they all intersected walls, as well as the ceramic assemblage they contained, leaves little doubt that they were dug after the mudbrick buildings collapsed.

¹² A fragment of an early Meidum bowl (not illustrated here) was notably found in area 2.

¹³ For a more detailed discussion and further arguments on that topic see GUYOT in press.

¹⁴ STEVENSON 2016.

two allegedly distinct cultures (Neolithic and Predynastic) at the turn of the 5th and 4th millennia BCE. Accordingly, it is suggested here to extend the Neolithic period until c. 3300 BCE, without referring to the Predynastic period insofar as the distinctive features of the latter with respect to the Neolithic period remain poorly defined.

Gradual changes in the economic practices and material culture of Lower Egyptian communities from the sixth to the 4th millennium BCE allow a distinction to be made between what can be termed as an Early and a Late Neolithic period. On the basis of the available archaeological record, it is possible to further identify five sub-phases, the main features of which can be summarized as follows. During the Early Neolithic 1 (c. 6000–5000 BCE), the first domestic animals (goat, sheep, and likely cattle) were introduced into Egypt from the southern Levant by mobile groups from the Sinai Peninsula.¹⁵ Although very limited at first, the spread of domestic animals marked the onset of a food-producing economy in Egypt and thereby the beginning of the Neolithic period. To date, these early mobile herding systems are documented only in the present hyper-arid areas extending on both sides of the Nile Valley. The Early Neolithic 2 (c. 5000–4500 BCE) began with the introduction of cereals, pulses and the pig into Lower Egypt through a second wave of cultural diffusion originating from the southern Levant as well.¹⁶ Local populations gradually added domestic crops and animals to their food base, although the subsistence strategies of Nilotic communities remained heavily reliant on hunting, fishing, and gathering wild plants. Although domesticates were still of little economic importance, Lower Egyptian groups started to settle as herders and farmers in the heart and along the margins of the Nile Delta, leading to the emergence of the first villages. During the Early Neolithic 3 (c. 4500–4000 BCE), permanent settlements grew in extent, while the products of agriculture and livestock keeping became predominant in the diet of the populations.¹⁷ The human occupation at Tell el-Samara is first documented at that time (Tab. 1).

At the beginning of the Late Neolithic 1 (c. 4000–3600 BCE), changes in the material culture of northern populations echoed gradual developments in economic and social practices. Nonetheless, the range of these developments remained limited and did not foster significant shifts in the modes of production or in the social organisations of local communities. From this period onward, the two regional cultures of Lower and Upper Egypt started to differ from one another and follow their own path of evolution.¹⁸ As for Lower Egypt, the steady evolution of the Nile Delta's communities continued in the Late Neolithic 2 (c. 3600–3300 BCE). While some minor changes are visible in the material culture and the settlement pattern,

¹⁵ LINSELEE et al. 2014, pp. 13–14; LINSELEE, HOLDAWAY, WENDRICH 2016, pp. 2, 8; BARICH 2016, pp. 206–207; LESUR 2018, p. 60.

¹⁶ WETTERSTROM 1993, pp. 197–211; LINSELEE, HOLDAWAY, WENDRICH 2016, pp. 16–17. The earliest settlements.

¹⁷ WETTERSTROM 1999, pp. 138–140.

¹⁸ For an overview of the relative chronology of the 4th millennium BCE settlements and cemeteries in Lower Egypt see TASSIE 2014, p. 425. The question as to whether the Neolithic Lower Egyptian communities were all part of a single regional culture extending uniformly from the Nile Delta to the Fayum is difficult to address owing to the still limited number of sites documented for the period between c. 5000 and c. 3300 BCE (for a review of the settlements and cemeteries documented for each period see for instance GUYOT in press). Additionally, these sites are scattered both geographically and chronologically. It is therefore difficult to assess whether the slight discrepancies that could be observed from one site to another in terms of material culture or subsistence strategies stemmed from environmental constraints, technical evolution or cultural choices (contra KÖHLER 2017, p. 345).

the communities of the second third of the 4th millennium BCE had a way of life and an economy fairly similar to those of their predecessors of the late 5th millennium BCE. It is not until c. 3300 BCE that drastic changes occurred in every aspect of society. In settlements, large mudbrick buildings superseded the scattered dwellings made of reeds and wood that had hitherto prevailed.¹⁹ The means of production and the means of subsistence (i.e. pottery, flint industry, bread, beer, etc.) were no longer organised at a household level: they were gathered in workshops producing large amounts of goods and food staple for the entire community.²⁰ In the cemeteries, the ostentatious display of wealth in some burials reflects the emergence of a social distinction between individuals and the advent of a hierarchical society.²¹ This clear break in the protracted development of socio-economic activities of Lower Egyptian groups as it unfolded from the 5th millennium BCE onward, can be viewed as marking the end of the Neolithic period. It paved the way for the growth of urban life and the rise of a highly differentiated society that occurred in the following period. The latter can be referred to as the Protodynastic period as it was, in many respects, the prelude to the advent of the 1st Dynasty ca. 3000 BCE.

The chronological limits of the sequence defined above are deliberately loose, owing to the limited amount of secure ¹⁴C dates published thus far.²² Nevertheless, a chrono-cultural sequence of the remains uncovered at Tell el-Samara can be tentatively proposed as illustrated in the table below (Tab. 1).

Tell el-Samara					Periods	Conventional terminology
Levels	Estimated date	Area 1	Area 2	Area 3		
Level 1	c. 4500-4000 BCE	Settlement	?	?	Early Neolithic 3	(Late) Neolithic
Level 2	c. 4000-3600 BCE	Settlement			Late Neolithic 1	Buto I
Level 3a	c. 3600-3300 BCE	Settlement		Settlement	Late Neolithic 2	Buto II
Level 3b		Burials				
Level 4a	c. 3300-3100 BCE	Settlement	Settlement	Settlement	Protodynastic	Naqada IIIB
Level 4b	c. 3100-2900 BCE	Cemetery			Early Dynastic	Naqada IIIC-D

TAB. 1. Occupation levels at Tell el-Samara.

1.3. Topography and stratigraphy of the tell: pros and cons

The archaeological site of Tell el-Samara has several assets for studying the development of the Nile Delta's first herding and farming communities. Firstly, the central part of the tell yielded archaeological remains dating back to the late 5th millennium BCE, which is quite rare

¹⁹ The earliest occurrences of mudbrick architecture in the Nile Delta are documented in the settlements of Tell el-Farkha (CHŁODNICKI, GEMING 2012, pp. 95–103), Tell el-Iswid (BUCHEZ et al. in press), and Buto (VON DER WAY 1997, pp. 117–122).

²⁰ CIAŁOWICZ, 2012a, pp. 149–155; GUYOT in press.

²¹ DĘBOWSKA-LUDWIN 2012, pp. 53–58; KÖHLER 2017, p. 343.

²² WENDRICH et al. 2010, pp. 1001–1002; PHILLIPS et al. 2012, pp. 68–71; HARTUNG 2013, pp. 181–183; DEE et al. 2014, pp. 21–22; ROWLAND, BERTINI 2016, pp. 163–164; STEVENSON 2016, p. 425; ROWLAND 2021, pp. 175–179.

in Lower as in Upper Egypt. Secondly, the 5th and 4th millennia BCE layers are not deeply buried under later remains and can be reached less than a meter below the topsoil (especially in the northern part of area 1a). Thirdly, the sandy hill on top of which the first village was established was rather high, so the most ancient remains are nowadays located above the modern water table (unlike many other sites in the alluvial plains where the 4th millennium BCE levels are now permanently under the water table).²³

But at the same time this particular topography is also the cause of major hindrances when it comes to excavating the prehistoric remains. The overall thickness of archaeological deposits varies from only 75 cm in the northern part of area 1a, to 1.5 m in the south. This implies that the remains are both squeezed and badly eroded. This applies especially to the mudbrick building in Level 4a, of which only one or two courses of mudbricks were preserved. In the other levels almost all the remains that could have been identified were those dug into former occupation layers or into the *gezira*, such as pits, silos, trenches, and burials. Additionally, the limited thickness of occupation layers caused the material from several levels to be mixed when the settlement was inhabited. This could have happened either when the living floors were gradually packed during daily village life activities (many of the layers were no more than 5–10 cm thick), or when large pits and silos were dug. For instance, the digging of extensive pits in Level 3a (Fig. 4: Sq. H5-I5) brought back to the surface a vast amount of pottery sherds and flint tools from Levels 1 and 2. The latter have been found scattered around the opening of the pits or mixed with the contemporary material in their filling. Likewise, the digging of rather deep graves in Level 4b (Figs. 33–34) led to the mixture of all of the archaeological material coming from underlying levels. As a consequence, the filling of Early Dynastic burials often yielded pottery sherds coming from the late 5th or mid-4th millennium BCE settlements layers. Although this phenomenon is frequent in settlement contexts, it seems to be particularly pronounced at Tell el-Samara owing both to the limited thickness of archaeological deposits and the high concentration of pits, silos and burials.²⁴

Another consequence of the limited thickness of occupation layers is that they were often difficult to identify and to follow over large areas. This is well illustrated in the western section of area 1a (Fig. 5: section 3, Sq. F6-F9).²⁵ The low accumulation of anthropogenic deposits before the construction of the Protodynastic mudbrick buildings in Level 4a was also apparent in the centre of area 1a, where they were about 40 cm thick (see on Fig. 27

²³ At Tell el-Samara, the lowest levels lay above the water table in winter, which explains why fieldwork is held during this season. The elevation of the water table varies depending on the agricultural activities in the surrounding fields. From December to March, the fields lay fallow and are not irrigated. The elevation of the water table is about 1.4 m above sea level (i.e. approximately 10 cm below the bottom of the deepest remains excavated so far: humidity rising along the walls of pits and silos is nonetheless well visible in Fig. 14). Cultivation starts again from April; the water table then rises to about 2.7 m asl (above sea level), inundating the lowest archaeological levels. The latter are thus periodically sunk under water, which has severely affected the preservation of organic materials in addition to the high content of salt in the water due to the nitrates used as fertilizers in the fields around.

²⁴ As described in the study below, many stone implements were found as intrusive material in later deposits. This issue is far less acute regarding the faunal remains since the bulk of them have been collected in silos and large undisturbed pits (i.e. closed and homogeneous contexts, which, on the contrary, yielded only very few flint tools).

²⁵ See also the section in Fig. 13. The layers 2–4 (Levels 2–3a) were getting thinner to the north. From Sq. F7 the overall thickness of deposits from Levels 1–3 (i.e. almost one millennium of human occupation) did not exceed 15–20 cm.

the east-west section under the building). A similar situation can be observed in area 1b.²⁶ This may have led to some difficulties in attributing some of the layers and pits to either Level 2 or 3, especially when they did not contain many pottery sherds. The identification of features from Level 1 has been less problematic for they lie just above the virgin sand of the *gezira*. Lastly, the sediments from the deepest layers close to the *gezira* were very sandy. As the sandy soil is very sensitive to humidity the remains become uniformly covered with a thin dust-like layer of dry sand shortly after being unearthed. This sometimes made the limits of trenches, pits, and silos quite difficult to locate properly (Fig. 21). Despite the repeated use of sprayers to humidify the soil, the openings of some silos and pits went unnoticed from time to time during the fieldwork. In such cases the archaeological material from the upper part of their fill may have been mixed accidentally with the material from the surrounding (earlier) layers.²⁷ In addition, many pits intersected older ones, and some of the largest contained several layers of fill reflecting the successive periods of activity and abandonment in this part of the settlement.²⁸ In both cases, the sediments from different fills inside a single pit were very similar in colour and texture. Therefore, it cannot be excluded that a small portion of the archaeological material from the junction between the successive fills was mixed during excavations.

Despite these possible biases that remain inherent to settlement archaeology, the vast majority of the data presented in this paper can be considered to come from homogeneous and stratigraphically controlled contexts.²⁹ In order to provide a study of the ceramic assemblage, lithic industry, and faunal remains as representative as possible, the sediments from Levels 1–3 were systematically sieved with a 5 mm mesh after drying. A finer mesh (2 mm) was used for specific features such as graves and fireplaces. The amount of sediments from Level 4 was too substantial to be sieved consistently: only some locations were selected for sieving (e.g. rooms, pits). Elsewhere, the artefacts were collected by hand during the unearthing of the remains. This technique, unsatisfactory but driven by time and technical constraints, has inevitably resulted in the under-representation of small artefacts (e.g. flint blades, fish-bones) in the records from Level 4. This limitation has to be kept in mind when comparing the lithic and faunal assemblages from Levels 1–3 to those from Level 4. In addition, the fills of every silo and some of the pits have been sampled for flotation for an upcoming archaeobotanical study. The soil at the bottom of every silo and fireplace has been sampled, as well for further phytoliths analyses.

²⁶ The opening of a large storage jar sunk into the sand of the *gezira* (Fig. 11 top left) showed the elevation of the floor related to the first mudbrick building in the area (Fig. 9b). The wall visible in the eastern part of the northern section (Fig. 11 top right) was part of the second stage of construction (Fig. 9c). In area 1b, the thickness of archaeological deposits between the virgin sand and the Protodynastic buildings also varies from 15 cm to 20 cm.

²⁷ As far as possible, a specific locus number was given to the artefacts coming from mixed or unclear contexts to allow specialists to process them independently from those coming from undisturbed contexts.

²⁸ See for instance the pit from Level 2 partially superimposed on an earlier pit from Level 1 (Fig. 8: Sq. G9–H9), and the large pit containing two layers of filling respectively from Levels 2 and 3a (Fig. 5: Sq. F5; Fig. 22).

²⁹ By combining the stratigraphic data and the results of the pottery study, it can be stated that 77% of the loci identified in areas 1a–1b were homogeneous contexts containing unmixed material. About 15% were slightly disturbed contexts with some intrusive material (<10% based on the ceramic assemblage), 8% were mixed contexts.

2. ARCHAEOLOGICAL REMAINS FROM THE NEOLITHIC TO THE EARLY DYNASTIC PERIODS

Frédéric Guyot

2.1. Level 1: Early Neolithic 3 (c. 4500–4000 BCE)

Very little is known about the human occupation of the Nile Delta prior to the 5th millennium BCE. Scarce remains of seasonal encampments and concentrations of stone tools uncovered near Merimde and el-Omari indicate that small mobile groups of Epipalaeolithic hunters-fishers-gatherers subsisted along the deserts margins of the Nile Delta before the emergence of the first villages and the onset of agriculture.³⁰ In the heart of the Nile Delta, the earliest evidence of human occupation is documented at Sais in the mid-5th millennium BCE (Early Neolithic 2), and it is probably safe to assume that the region of Tell el-Samara was already inhabited by mobile groups before the late 5th millennium BCE (Early Neolithic 3) when the first village was established on top of the *gezira*. The origin of the early villagers is a compelling issue: were they migrants from a nearby settlement, or were they members of a Epipalaeolithic group who gradually adopted the Neolithic life-style as a result of prolonged contacts with farmers and herding communities already settled in the area? While this question will probably long remain unsolved, the study of the faunal remains gives an interesting insight on the subsistence strategies of these settlers. As demonstrated below, livestock keeping was already well-developed in the earliest settlement. The same is probably true for agriculture judging by the large number of silos excavated in the first village. It thus appears that the formative stage of the food-producing economy is not documented at Tell el-Samara, unlike what can be observed in the early settlements of Merimde and Sais (Early Neolithic 2), where the wild food staple prevailed and the domesticates only played a complementary role in the populations' diet. To that extent, the subsistence strategies of the early villagers at Tell el-Samara should have been quite similar to those of the groups living at el-Omari, in the late Merimde village and, to a lesser extent, in the cluster of sites in the Fayum area (Early Neolithic 3).³¹ This suggests that the Neolithic economy was already well-spread into the alluvial plains of the Nile Delta from the mid-5th millennium BCE when the first village was founded at Tell el-Samara. Gradual changes in climatic conditions and the fluvial network, which made the Deltaic landscape more stable and thereby more amenable for agriculture and livestock keeping, are likely to have facilitated the development of farming and herding at that time.³²

The buildings from the early settlement at Tell el-Samara consisted of ephemeral constructions probably made of twigs, bundles of aquatic plants, and wattle-and-daub. Nothing remains of their superstructure (probably supported by a wooden frame), except some fragments of fired clay that originally covered the walls (Fig. 10b). About twenty of these fragments were found scattered in pits and occupation layers in area 1. Their inner sides bear impressions of vertical and horizontal branches tangled or tied together to make the framework of the walls. Their outer sides are most often roughly smoothed, although some pieces are impressed on

³⁰ TASSIE 2014, pp. 107–112; ROWLAND, BERTINI 2016, pp. 162–164.

³¹ WETTERSTROM 1993, pp. 214–216; ROWLAND, BERTINI 2016, pp. 169–170; WENDRICH, TAYLOR, SOUTHON 2018, pp. 49–50.

³² PENNINGTON et al. 2017, pp. 224–226.



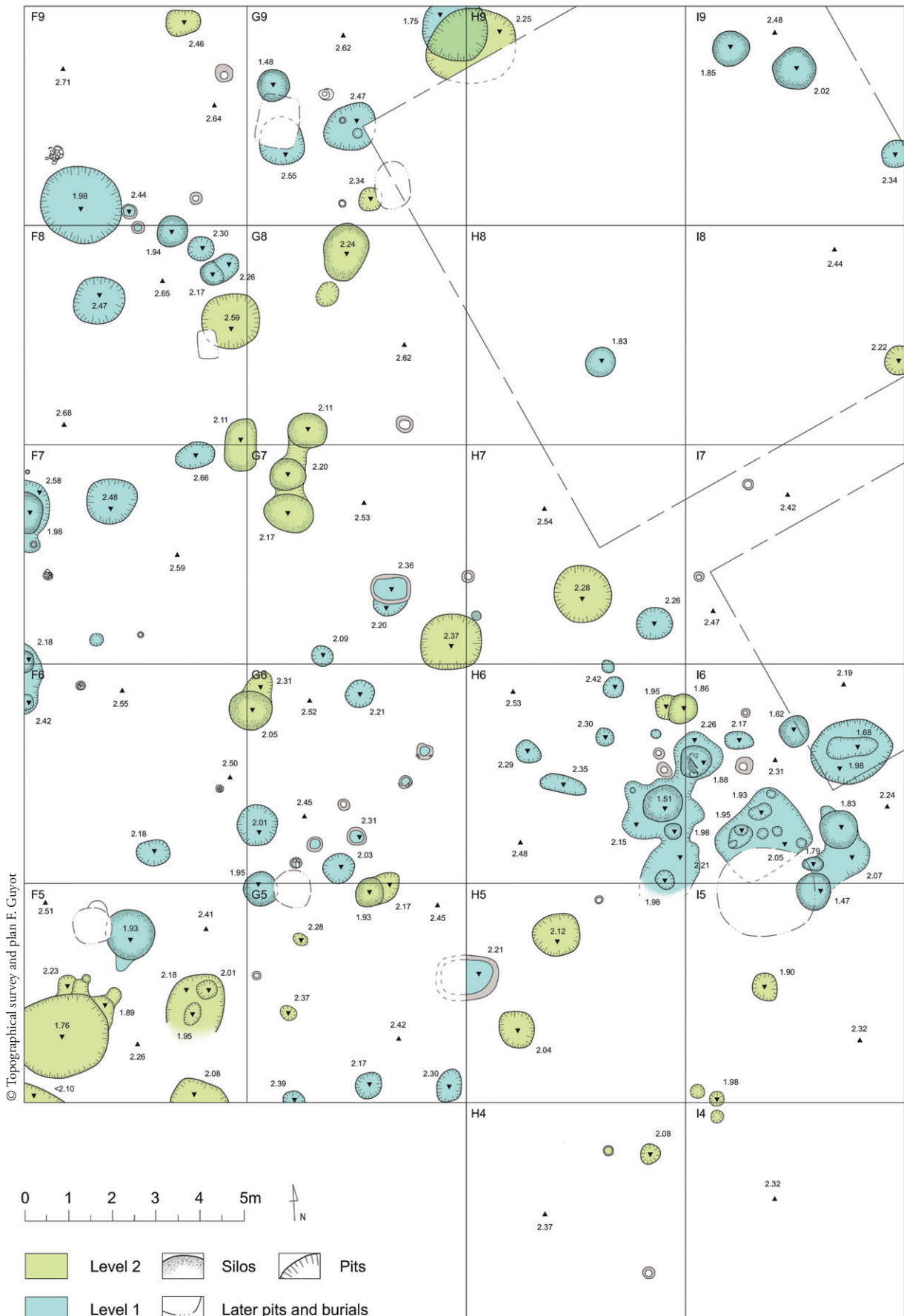
FIG. 7. Late fifth millennium BCE silos dug into the virgin sand of the *gezira* in area 1a, view to the south-west.

both sides, suggesting that they were originally located between two bundles of twigs. Typically, the twigs are 1–1.5 cm in diameter but larger impressions may occur when the clay coating was applied on a larger piece of wood. On some fragments, very thin and intertwining impressions strongly suggest that wild plants (e.g. reeds) were also used as building material without their leaves being removed.³³

Permanent or semi-permanent domestic structures were delineated by narrow, shallow trenches for the bases of thin linear walls. Such features were found in great number in the lowest level, yet the layout of the buildings remains unclear.³⁴ Most of the dwellings seem to have been rectangular in plan as evidenced by a series of trenches intersecting at right angles and delineating rows of side-rooms and small compartments (Fig. 10a). Long parallel trenches,

³³ Further archaeobotanical studies will aim at identifying through these impressions the range of plants and woods used as building material.

³⁴ This is mainly because the accurate clearing of these features could not be completed during the 2019 season, owing to a violent storm that hit the site a week before the end of the campaign. The lower parts of area 1a were drowned under more than a meter of rainwater, so the silos, burials, and pits were all entirely filled with water. Even after using irrigation pumps to extract the water, three days were necessary to let the soil dry, and two more to remove the mud. It was therefore decided to suspend excavations and to allocate the last two days of fieldwork to the topographical survey of already excavated remains. The delay caused by this heavy downpour had two consequences for the results presented here. Firstly, only some of the numerous postholes uncovered in Levels 1 and 2 are reported on the plan (Fig. 8). Secondly, none of the numerous trenches visible against the *gezira* has been excavated properly. The occupation layers being very thin and unclear in the northern part of area 1a there was insufficient evidence to assign these trenches to Level 1, 2, or 3 without studying the material they contained. Thus, it was considered preferable not to show the trenches excavated in 2019 on the plan, whilst acknowledging that this choice could provide an incomplete and somewhat biased picture of the settlement layout.



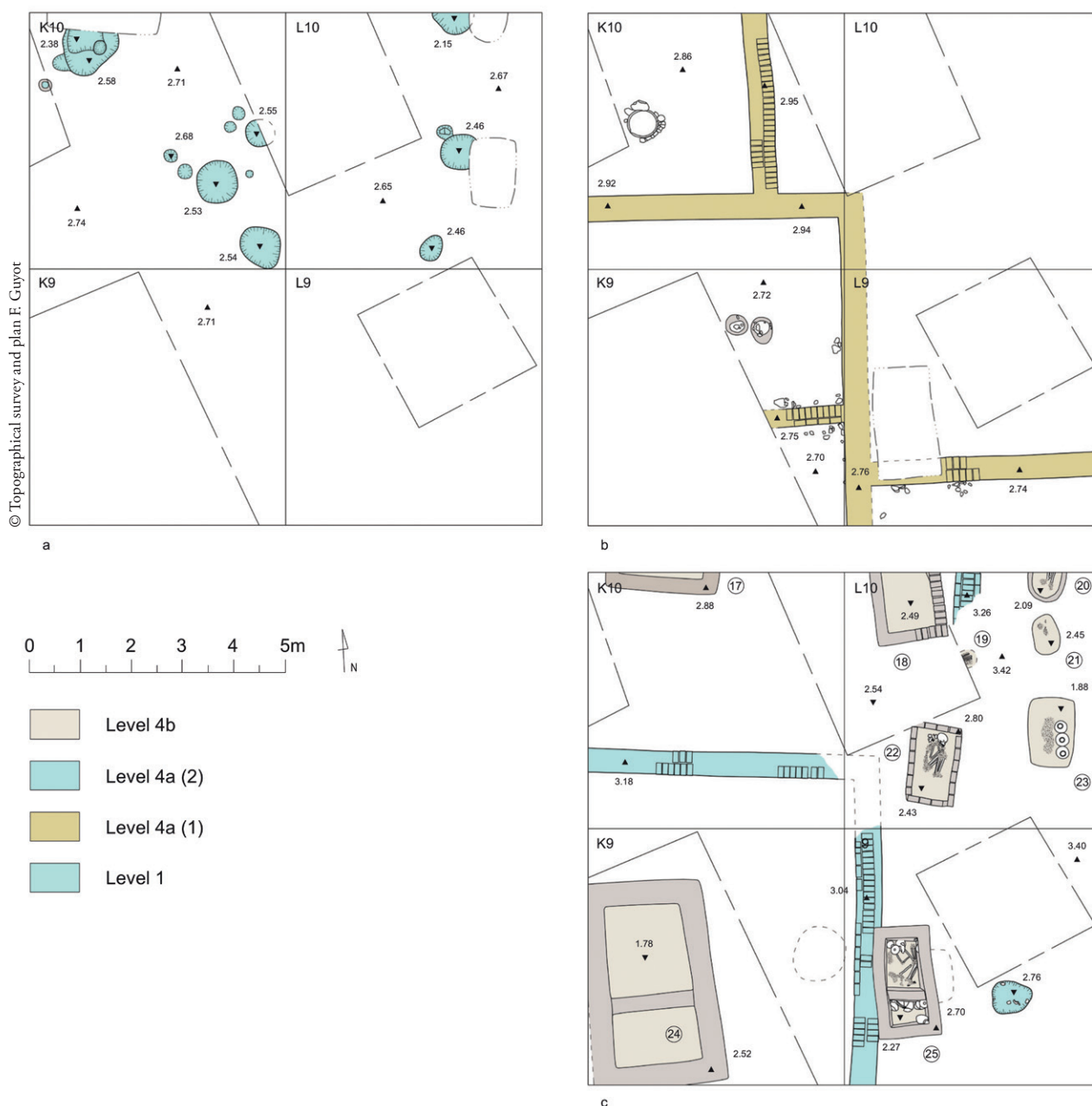


FIG. 9. Area 1b, remains from Levels 1 and 4 (tombs numbers are circled).

running north-south over more than four meters in the northern part of the area, were probably fences. Various postholes, in which the wooden poles supporting the walls and the roof of the buildings were set, are also documented. Judging by their scattered distribution over the excavated area, the postholes identified so far were neither aligned in a specific pattern from which the limits of some dwelling units (e.g. oval or round huts) could be inferred, nor significantly more numerous around the openings of pits. However, the lack of distinctive layout may be due to the fact that several postholes were not detected during fieldwork. Many of them were mere cylindrical holes without lining. They were filled with the same sandy light

brown sediment as the surrounding layers—which makes them extremely difficult to detect. In some instances the bottom of postholes was lined with a thick (3–5 cm) layer of pure clay reinforced with pottery sherds, pebbles, or broken stone implements to stabilise the base of the wooden pole.³⁵ Quite often the clay lining was fired, giving the posthole a reddish colour and a friable texture (Fig. 15d; note that the grinding stone embedded in this posthole will be further discussed below in the study of stone implements). A single fireplace was found in Level 1 in the form of a shallow pit filled with ashes and burned animal bones (Fig. 15e).

Storage facilities developed over the 5th millennium BCE as populations became increasingly dependent on agricultural products. The most typical were simple cylindrical silos dug into the ground. Thirteen of them have been unearthed in Level 1 (Figs. 7, 14). They were between 80 cm and 1 m in diameter. Their depth varied from 40 cm to 1.1 m, but most were 50–70 cm deep. Their walls were always perfectly cylindrical, their base was almost flat, and none of them was coated with clay. Among the storage facilities recently excavated in the Fayum, similar silos lined with basketry were still sealed with a mortar made of sand mixed with crushed shells that was poured over the opening to keep it airtight.³⁶ The cereal grains stored inside were thus kept in a confined atmosphere for the long-term conservation of spikelets and grains that could be consumed long after the harvest or replanted the following year. At Tell el-Samara, no evidence has been found for how the silos were sealed. This is due to two combined factors. First, all the silos excavated to date were emptied while the village was inhabited: their lids (made of clay or wickerwork?) were taken off, their content removed, and after they fell out of use they were filled with all sorts of domestic refuse. Their fills thus resulted from a secondary use. Second, the high humidity level in the lower layers, and especially at the bottom of the silos, did not allow for the preservation of organic materials such as basketry for lining their walls or wickerwork for closing them up. The silos from area 1 nonetheless provided a wide range of information not only on the subsistence strategies of the first villagers thanks to the large amounts of burned animal bones and fish bones they yielded, but also on their material culture through the numerous pottery sherds and flint tools they contained. Preliminary flotations on the blackish and organic rich sediment covering the lower part of the silos confirmed that some grains were left on the bottom when the facilities were emptied (probably several times before being abandoned). The forthcoming archaeobotanical study will aim at determining which sub-species of cereals and pulses were cultivated at Tell el-Samara in the late 5th millennium BCE.³⁷

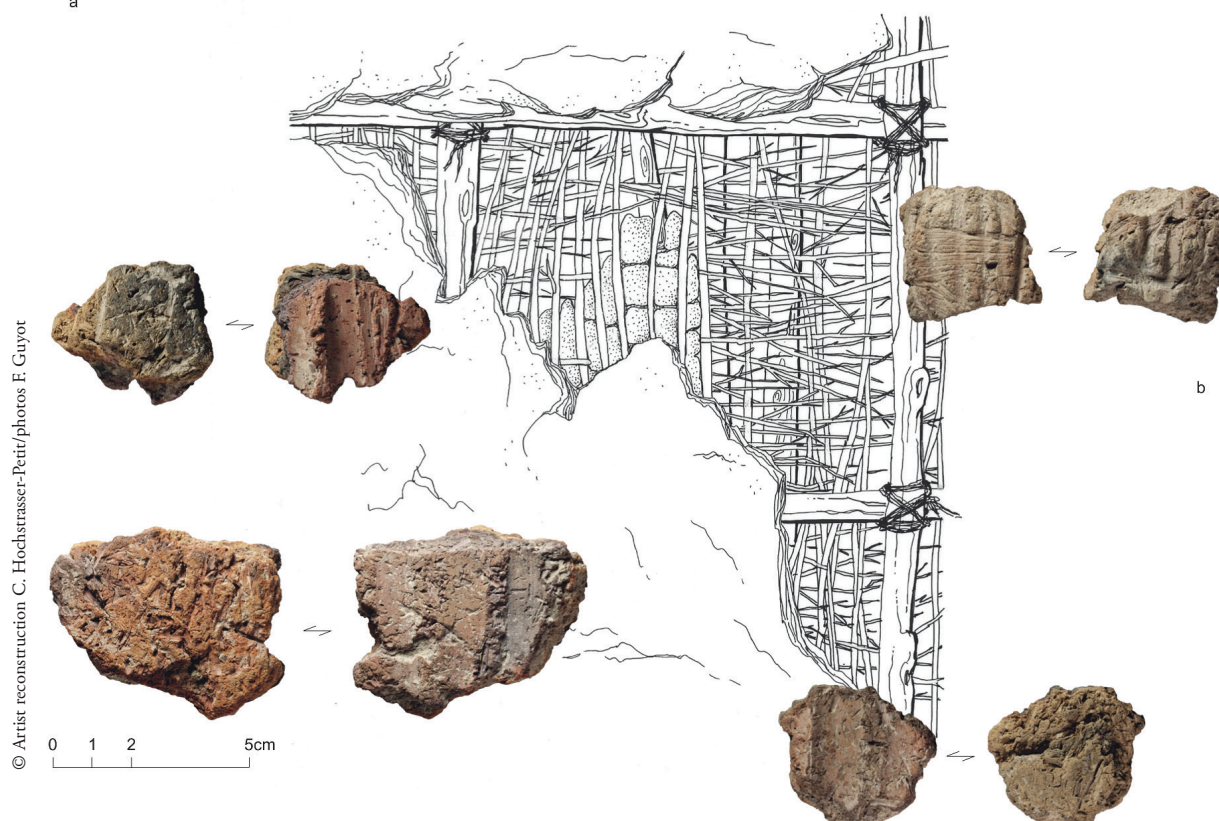
³⁵ Among the 38 postholes recorded in 2019, 8 were lined with clay, 14 were uncoated, and 16 did not provide enough stratigraphical or material evidence for being attributed to either Level 1 or 2. Both kinds of postholes are illustrated in Fig. 15c: on the right side of the picture an uncoated posthole was dug next to another one lined with clay. Two similar postholes, appearing as brown rings standing in sharp contrast against the sand of the *gezira*, are visible in Fig. 1918. Such postholes are much harder to detect in the later occupation layers since their infill was similar in colour to the surrounding sediments.

³⁶ WENDRICH, CAPPERS 2005, pp. 14–5; HOLDAWAY, WENDRICH 2017, pp. 133–134. See also DEBONO, MORTENSEN 1990, p. 79.

³⁷ In the light of current knowledge, it seems that early agriculture in Egypt was mainly based on two sub-species of hulled cereals: 6-Row barley (*Hordeum vulgare* ssp. *vulgare*) and emmer wheat (*Triticum turgidum* ssp. *dicoccon*). Among pulses, peas (*Lathyrus oleraceus*) and lentils (*Vicia lens*) were cultivated as well. Einkorn wheat (*Triticum monococcum* ssp. *monococcum*), spelt (*Triticum aestivum* ssp. *spelta*) and chickpea (*Cicer arietinum*) are not documented in the archaeological records. On that topic see MURRAY 2000, p. 513; CAPPERS, HAMDY 2007, p. 167; CAPPERS 2013, p. 117; LINSEELE et al. 2014, p. 16.



a



b

FIG. 10. Evidence for Early Neolithic 3 architecture made of wattle-and-daub: (a) clearing of Level 1 trenches in progress (buckets are intended to collect soil samples); (b) fragments of fired clay bearing twig impressions.

Besides the silos, a large number of pits were dug into the *gezira* all over the settlement. The most frequent were simple, oval or circular pits, ranging from 80 cm to 1.2 m in diameter, and from 20 cm to 30 cm in depth (about forty of them have been uncovered). They were not coated with clay and their opening had no specific layout. They were probably used for many different purposes before being ultimately transformed into refuse areas. Good examples of such pits can be seen in area 1b (Fig. 11). Two of them were surrounded by smaller circular depressions that could have been either postholes or places for holding bases of pottery jars, as was the case for one of the pits excavated in area 1a (Fig. 13). Diffuse patches of ash were noticed nearby on the sandy sediments of the living floor slightly more greyish in colour than the sand of the *gezira*. Similar pits were recorded in area 1a: in one of them a complete bowl was sunk into the ground (Fig. 8: Sq. G9).³⁸ It is tempting to interpret at least some of these features as bottoms of huts excavated a little bit below the surrounding floors. However, to take this hypothesis any further, evidence for a superstructure (e.g. series of postholes around the pits, fragments of walls *in situ*) is still lacking.³⁹ Although less frequent, larger pits (1.6–2 m in diameter, 60–80 cm deep) and groups of medium size pits connected by shallow depressions have been uncovered as well (Fig. 8: Sq. F6–F7, H6–I6). Nothing in their layout or content suggests that they had a specific purpose. A somewhat different pit was found in area 1b (Fig. 9a: Sq. K10). It comprised two circular depressions, most likely used for holding pottery jars, and a deeper compartment in the north. Regrettably, it has been intersected by a Protodynastic tomb, which makes its function difficult to interpret. Mention should also be made of two pits coated with clay (Fig. 8: Sq. G7, H5). The first was about 30 cm deep and had two compartments: after the pit was dug, the northern compartment was delimited by a short division wall and covered with a thick (5–9 cm) layer of clay (Fig. 12). The southern compartment, left uncoated, was found full of blackish sediment. The facility was possibly related to the processing of cereal grains or the preparation of foodstuffs.⁴⁰ The second coated pit has been excavated only partially and its layout is unclear. Judging by its general similarities with the previous one, it might have shared the same functions.⁴¹

The various pits, silos and trenches were not necessarily in use at the same time, and a spatial organization of economic activities can hardly be inferred from their distribution across area 1.⁴² Only one cluster can be tentatively interpreted as a domestic unit (Fig. 8: Sq. H6–I6; Fig. 14).⁴³ A roughly rectangular pit (about 2 m long, 1.5 m wide, and 0.4 m deep) was possibly the foundation of a hut with postholes in the corners and several depressions at the bottom.

³⁸ GUYOT, HOCHSTRASSER-PETIT forthcoming, fig. 8f, pl. 26a.

³⁹ There was no evidence of wood remains in any pits, possibly because they were gradually completely decomposed by the continuous rising and lowering of the water table. Even in the postholes coated with a thick layer of clay it has not been possible to detect any trace of wood remains. It is also possible that the poles were intentionally removed when the buildings were abandoned.

⁴⁰ On Fig. 12 the bottom of the thick lining of clay delimiting the northern compartment had already been removed for flotation. The study of plant macro-remains and phytolith analyses from both compartments will certainly help in assessing their respective functions.

⁴¹ The thick clay lining of the pit is quite visible on Fig. 1918 at the bottom of the western section of Sq. H5. Also visible on the sections is the contrast between the uneven surface of the top of the *gezira* and the nearly horizontal layers from Levels 3a–4a.

⁴² The thickness of the relevant layers was too limited to further refine the relative stratigraphy of each feature within a single level.

⁴³ See also GUYOT, HOCHSTRASSER-PETIT forthcoming, Fig. 2.



FIG. 11. Early Neolithic 3 pits in area 1b, view to the north.



FIG. 12. Clay coated pit with dual compartments from Level 1.



FIG. 13. Opening of an Early Neolithic 3 silo next to the base of a vessel sunk into the sand.



FIG. 14. Cluster of Early Neolithic 3 silos and pits in the south-eastern part of area 1a, view to the east.



FIG. 15. Late 5th millennium BCE remains from area 1a: (a) pit with oblong depression at the bottom (Sq. I6); (b) child burial in a pit (Sq. I6); (c) pits and postholes (Sq. G6, the pit in the background was related to Level 3a); (d) posthole lined with clay (Sq. G6); (e) firepit (Sq. I9). Late Neolithic I remains: (f) silo (Sq. G6).

East of the pit were a series of storage facilities connected by a shallow depression, including a deep silo in which a significant number of fish-bones were found. In the north-east, next to another silo, was an unusual pit with an oblong depression at the bottom, the purpose of which remains to be clarified (Fig. 15a). Two more silos were dug in the east. The southern part of the cluster has been destroyed by an extensive pit from Level 3a and partially damaged during the excavations led by MoTA in 2010. In addition, no indisputable evidence for the existence of a superstructure was found inside or around the rectangular pit. Owing to these limitations,

it seems advisable to maintain a conservative approach when it comes to the functional interpretation of this cluster. It is therefore proposed not to consider it as a well-organised dwelling unit unless better preserved examples are found in the future. The body of a young individual was buried in one of the pits after the area was abandoned (Fig. 15b). The body, in very bad condition, was buried in flexed position on the left side, without any grave goods or body ornaments. This is the only burial dated to the 5th millennium BCE uncovered so far at Tell el-Samara, although such isolated graves in abandoned parts of villages were not unusual in prehistoric sites.⁴⁴ Besides this grave, there is no indication of a gap in the settlement occupation between Levels 1 and 2. It can therefore be assumed that there was no link between the burial and the cemetery that later developed in the central part of the tell.

The pottery assemblage from Level 1 shows many similarities with the ceramic repertoire found in the other 5th millennium BCE settlements excavated in the Nile Delta and the Fayum. A comprehensive study of the pottery from Levels 1–2 has been proposed elsewhere, so only the main features will be presented here.⁴⁵ As might be expected in a settlement context, vessels were very fragmentary and came mostly from secondary contexts. They were built by coiling and many of them had an irregular shape. The single fabric documented in Levels 1–2 was a local clay tempered with chopped straw probably obtained from animal dung. The most frequent surface treatment (37%) was burnishing with a polishing tool on leather hard clay. The traces left by the tool were often visible on the surface. The surface of burnished potteries ranges in colour from dark brown to red or beige, suggesting uncontrolled firing conditions. The other group of surface treatment was wet smoothing (13%). The walls of the vessels were coated with a slip of the same composition as that used to make the outer surface even. The latter was then smoothed with wet hands, or by using a piece of fabric or leather (a tuft of straw could also be used for coarser specimens). However, on numerous potsherds (50%) the surface has peeled off because of erosion and humidity. This means that the surface treatment of half of the ceramics cannot be determined, which may give a biased view of the original assemblage. The whole repertoire of pottery shapes comprised utilitarian vessels dedicated to the daily tasks of processing, consuming and storing foodstuffs. Their production was most likely conducted by part-time artisans at a household level, as further indicated by the wide range of variations observed around a limited number of standard forms (Fig. 16a-p). Among the latter, restricted vessels decorated with a line of knobs applied below the rim were probably the most typical (Fig. 16l-o), although the undecorated specimens were far more common (Fig. 16p). The same is true for the deep bowls with straight wall, which can be regarded as another hallmark of the late 5th millennium BCE assemblage (Fig. 16g). Most of the unrestricted forms were nevertheless rather shallow bowls with slightly curved wall or wide opening (Fig. 16a-d). Besides large storage jars, restricted vessels were predominantly jars with piriform body and plain rim (Fig. 16j), and holemouth ovoid pots (Fig. 16e). Less frequent but equally typical from the Level 1 assemblage were: globular forms with flaring rim and highly burnished outer surface (Fig. 16k), restricted vessels with high neck (Fig. 16h-i), and fragments from fine carinated jars typically burnished (Fig. 16f). Close comparisons can be made with the pottery tradition documented at el-Omari, in the late settlement of Merimde (III–V),

⁴⁴ See for instance the contemporary graves in the settlement of Merimde (BADAWI et al. 2016, pp. 11–20).

⁴⁵ GUYOT, HOCHSTRASSER-PETIT forthcoming.

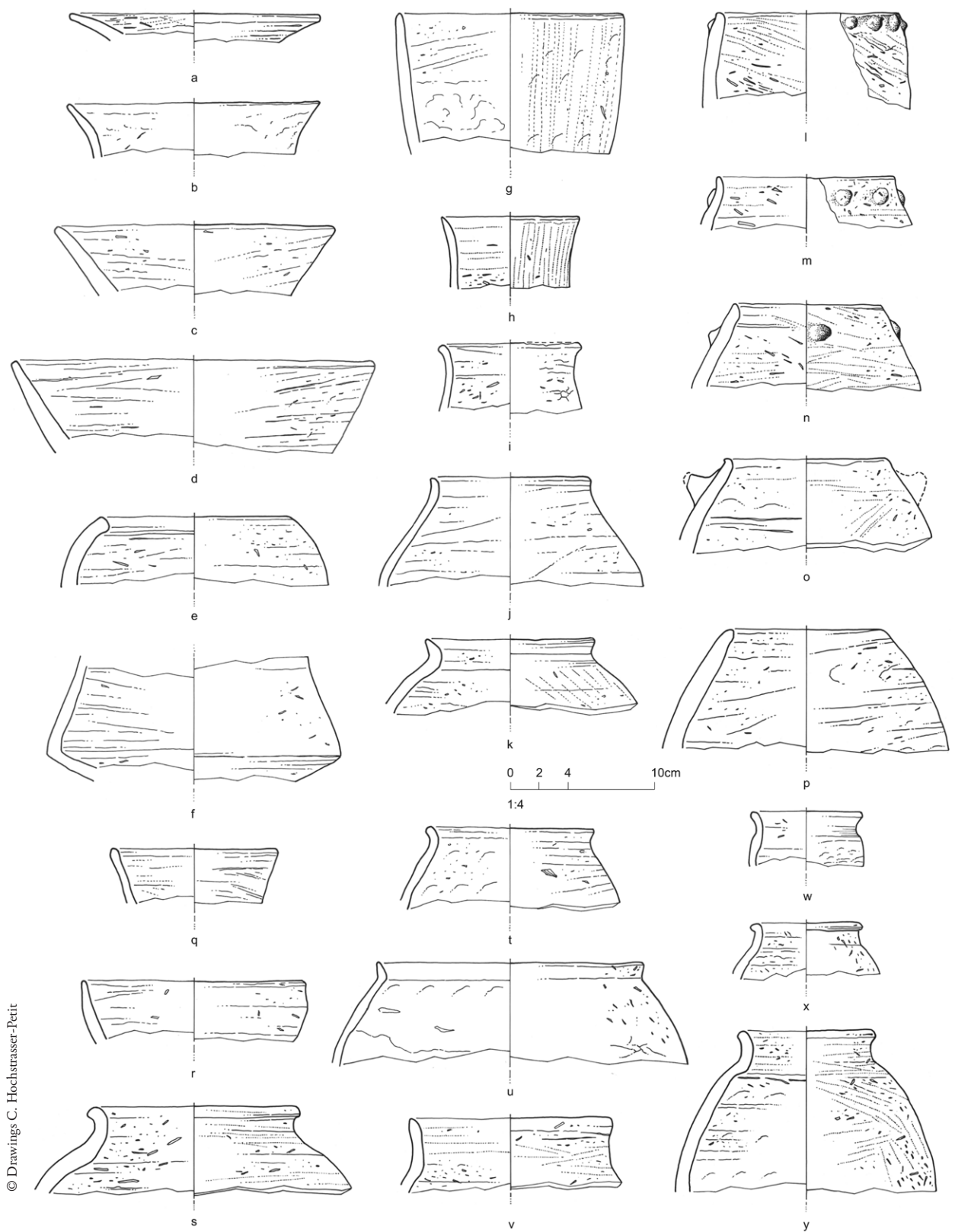


FIG. 16. Late 5th (a-p) and early 4th (q-y) millennium BCE pottery assemblage from area 1.

and in the cluster of sites at the eastern end of Lake Qarun.⁴⁶ Moreover, the vessels decorated with a fish-bone motif typical of the early phases of occupation at Merimde (I–II) and Sais (I) were significantly absent from the pottery records at Tell el-Samara (as they were from the settlements of el-Omari and the Fayum).⁴⁷ It is on the basis of these comparisons that it has been possible to relate the ceramic assemblage from Level 1 to the Early Neolithic 3 tradition, and to propose a mid-late 5th millennium BCE date for the foundation of the village.

In addition to the flint tools that will be presented in a separate section below, three bone objects coming from Level 1 deserve to be mentioned, both because they are fairly well preserved and because they are relatively rare in the Nile Delta prehistoric settlements.⁴⁸ Two distal fragments of pointed tools (Fig. 17a, c) bear extensive use-wear traces all over their surface showing that they were intensively used before being discarded. Both have a shiny dark brown surface that may be due to either a heat treatment or post-depositional chemical alteration. The second fragment (Fig. 17c) was possibly obtained from a ruminant metapod (with spongy bone left on the reverse side), while the first probably came from a segment of ulna. Raw bones have been cut into two or four pieces by using a regular sawing type technique, one of the most widespread cutting processes in the Mediterranean Neolithic. The third tool is a small irregular pointed tool from a flake of flat bone (Fig. 17b). Like the others it bears witness to intensive use and its surface is shiny brown in colour.

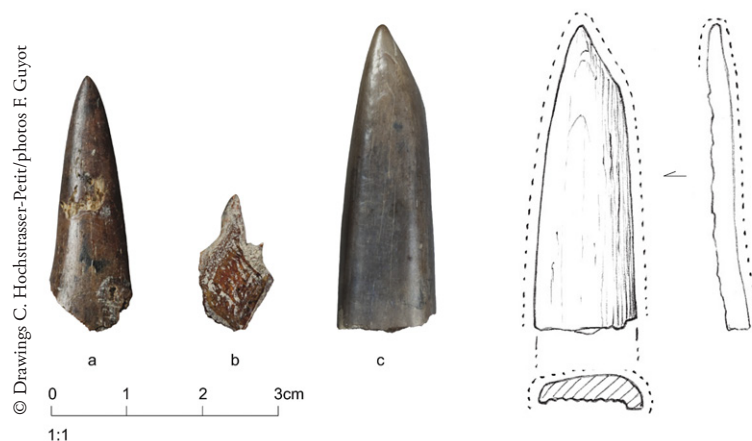


FIG. 17. Bone tools from Level 1.

⁴⁶ DEBONO, MORTENSEN 1990, pp. 24–33; EIWANGER 1992, pp. 20–33. Comparison with the material from the Fayum is made difficult by the limited data published to date on the ceramic assemblage (but see for instance CATON-THOMPSON, GARDNER 1934, pl. XIII.5, XIV.9, XVII.24). Additional information on the shapes of the vessels can be found in EMMIT 2020, pp. 129–131. As for Sais, phase II comprises possibly deflated and disturbed contexts (WILSON et al. 2014, pp. 31, 38). The ceramic assemblage from this level therefore contains late 5th millennium BCE material mixed with early/mid-4th millennium BCE potteries in a ratio that remains difficult to estimate.

⁴⁷ EIWANGER 1984, p. 19; WILSON et al. 2014, p. 161.

⁴⁸ We warmly thank Isabelle Sidéra (CNRS, UMR 7055) for these useful comments on the bone tools. Comments have been made after drawings and photographs. As such, they are only preliminary as the proper identification of fashioning methods and use-wear traces requires a direct study of the artefacts.

The picture emerging from the first village of Tell el-Samara is consistent with what is known from the contemporary settlements at el-Omari, Sais and Merimde. Although Merimde and el-Omari have been explored over much larger areas than Sais and Tell el-Samara,⁴⁹ no marked differences can be observed in building techniques, subsistence strategies, and material culture from one community to another.⁵⁰ Some time later, while populations were becoming more and more sedentary and increasingly dependent on domesticates, a distinctive regional culture started to emerge in Lower Egypt at the turn of the 5th and 4th millennia BCE as illustrated in Level 2 at Tell el-Samara.

2.2. Level 2: Late Neolithic I (c. 4000–3600 BCE)

The layout of the village does not seem to have changed much during the early 4th millennium BCE. Pits and silos make up the bulk of the excavated remains, in addition to some trenches and postholes. All these features were similar to those uncovered in Level 1. Pits had the same size and were equally uncoated. Yet, a singular large circular pit located in the south-western corner of area 1a was of special interest (Fig. 8: Sq. F5). It was about 0.5 m deep, and three lateral niches were opened slightly above its bottom. The latter was covered by a thick layer of clay (Fig. 22). Its overall appearance looked very similar to a foundation of a semi-subterranean dwelling with possible remains of a collapsed superstructure at the bottom. Yet here again, evidence of postholes around the pit or specific features inside (e.g. fireplace, heap of domestic waste, cluster of potteries or tools) are lacking to confirm this view. Among the silos, some were cylindrical in shape with an adjoining low step—possibly to make it easier to remove the grain and clean the silo (Fig. 15f). Other were more ovoid in shape with a larger diameter—such as the three silos dug in a row and linked by shallow depressions in the centre of area 1a (Fig. 8: Sq. G7). They differ from mere pits by their greater depths and vertical walls. It is noteworthy that none of the silos from Level 2 intersected those from Level 1.⁵¹ This may indicate that the storage facilities from the first village were not totally

⁴⁹ DEBONO, MORTENSEN 1990, pp. 13–14; EIWANGER 1992, pp. 8–13; WILSON et al. 2014, pp. 4, 39. At el-Omari, surface remains were scattered over more than 37 hectares. The maximum extent of the Neolithic settlement of Merimde is estimated between c. 25 hectares (EIWANGER 1999, p. 607) and c. 50–60 hectares (ROWLAND 2021, p. 171). It should however be noted that the settlements probably shifted over time, which might imply that not all the remains were contemporary. In addition, these settlements are unlikely to have been densely populated, but were rather composed of several isolated clusters of dwellings and working areas. Notwithstanding this, the inhabited areas were probably more extensive in Merimde and el-Omari, because the villages in the alluvial plains were somewhat restricted in extent by the space available on the top of the *geziras*. No evidence for permanent occupation has been documented to date in the Fayum area, and it has been suggested that the groups living in this region kept a mobile subsistence strategy supplemented by small-scale agriculture (HOLDAWAY et al. 2016, pp. 178–179).

⁵⁰ The architectural remains from Merimde have not been published in detail, apart from the oval constructions with mud-packed walls partially sunk into the ground (JUNKER 1932, pp. 43–51; EIWANGER 2007, p. 71; ROWLAND, BERTINI 2016, p. 166). Although much commented upon, these structures were few in number and unrepresentative of the dwellings uncovered in the late village that were widely made of wattle-and-daub and reeds. These oval constructions with mud-packed walls are not documented in other Lower Egyptian sites, but similar features are reported in Badari (BRUNTON, CATON-THOMPSON 1928, pp. 82–83). Semi-subterranean dwellings sunk into the wadi deposits at el-Omari (DEBONO, MORTENSEN 1990, pp. 17–21) could provide comparisons to the largest pits excavated at Tell el-Samara, which have been mentioned above as possible hut foundation.

⁵¹ Only one pit has been partially dug above an earlier one (Fig. 8, Sq. G9–H9).

filled in the early 4th millennium BCE, or at least that their outlines were still visible on the surface. For ensuring the tightness and stability of their silos, the villagers from Level 2 then carefully avoided these locations filled with loose sediments. This could be a further argument for assuming a relative continuity in the human occupation of the tell between Levels 1 and 2.

Apart from these few pits and silos, very little is known of the Level 2 settlement which is still the least documented prehistoric occupation on the tell. This is mainly due to the very poor preservation of the occupation layers, which have been heavily deflated all over the excavated area before, or shortly after, the beginning of Level 3 settlement. This makes the occupation layers from Level 2 extremely difficult not only to identify, but also to excavate over surfaces large enough to be representative. This is especially true in the northern and central parts of area 1a where they can hardly be distinguished from the subsequent dark brown layers from Level 3 (with which they are frequently intermingled). Only some patches not thicker than 5 cm were preserved here and there, notably next to the large circular pit described above, and around a jar probably found *in situ* (Fig. 5: Sq. F6–F9; Fig. 8: Sq. F9). As previously mentioned, no layer related to Level 2 was found in area 1b, but a handful of sherds without context. Although limited, the data available on the Level 2 settlement do not argue for a marked change in building techniques and dwellings layout. A series of postholes and linear trenches bear witness to ephemeral architecture made of wickerwork or wattle-and-daub. While their plans are still difficult to determine in the current state of fieldwork, there is no evidence to suggest that they were markedly different from those built in Level 1.

The pottery assemblage from Level 2 is to a great extent inherited from the late 5th millennium BCE tradition, which is less true with regard to the lithic industry (see below). Fashioning techniques and surface treatments remained unchanged, while many of the most common forms showed strong similarities with the former repertoire (Fig. 16q–t). However, new shapes appeared in the ceramic assemblage that would be the most representative elements of the Lower Egyptian material culture in the mid-4th millennium BCE. Three types of vessels in particular came into use at that time before becoming widespread in the subsequent Late Neolithic 2 pottery tradition: small spherical pots (Fig. 16w), small to medium size restricted forms with ovoid body, short neck and rounded rim (Fig. 16x–y), and jars with marked cylindrical neck and plain rim (Fig. 16v). While the Late Neolithic 2 material culture is today well-documented in many settlements and cemeteries, its origins in the early 4th millennium BCE are still poorly known. Until the renewal of fieldwork at Tell el-Samara, only three settlements dated to the Late Neolithic 1 period were known: Maadi, Buto and Tell el-Iswid.⁵² Despite the poor preservation of the remains, Level 2 is therefore of considerable importance for studying the emergence and growth of a distinct material culture in the north of Egypt. It is to be hoped that the continuation of fieldwork at Buto, Tell el-Iswid and Tell el-Samara will provide more data for better understanding this formative period of the Lower Egyptian culture.

⁵² RIZKANA, SEEHER 1987, pp. 34–45; HARTMANN 2003, pp. 167–180; VON DER WAY 1997, pp. 77–80; GUYOT 2015, p. 14. The pottery from the contemporary cemeteries of Tell el-Mashala and Kom el-Khilgan has not been published yet.

2.3. Level 3a, Late Neolithic 2 (c. 3600–3300 BCE)



FIG. 18. Occupation layers from Levels 2 and 3a in the southern part of area 1, view to the south-west.

In the mid-4th millennium BCE, the general pattern of the settlement was still in keeping with the former occupations on the tell: architectural remains were very close to those from Levels 1–2, and there is no evidence for a significant break in human activity between Levels 2 and 3 (such as, for instance, aeolian sand deposits or abandonment layers). The relative continuity between both occupations is particularly visible in the successive fills of the above mentioned large pit in the south-western corner of area 1a (Fig. 5; section 3; Fig. 19; Sq. F5; Fig. 22). At the beginning of Level 3, only a small part of the pit was filled: the depression was reused as indicated by thick patches of clay at the bottom of the Late Neolithic 2 layer (layer 3). A silo was later dug nearby, and a shallow pit was ultimately dug into the successive fills (layer 4). Unlike what has been observed in Level 2, pits and silos from Level 3a intersected Level 1 facilities in several locations. The openings of the former silos, dug more than 400 years earlier, were presumably no longer visible at that time—just like the pits and other remains.

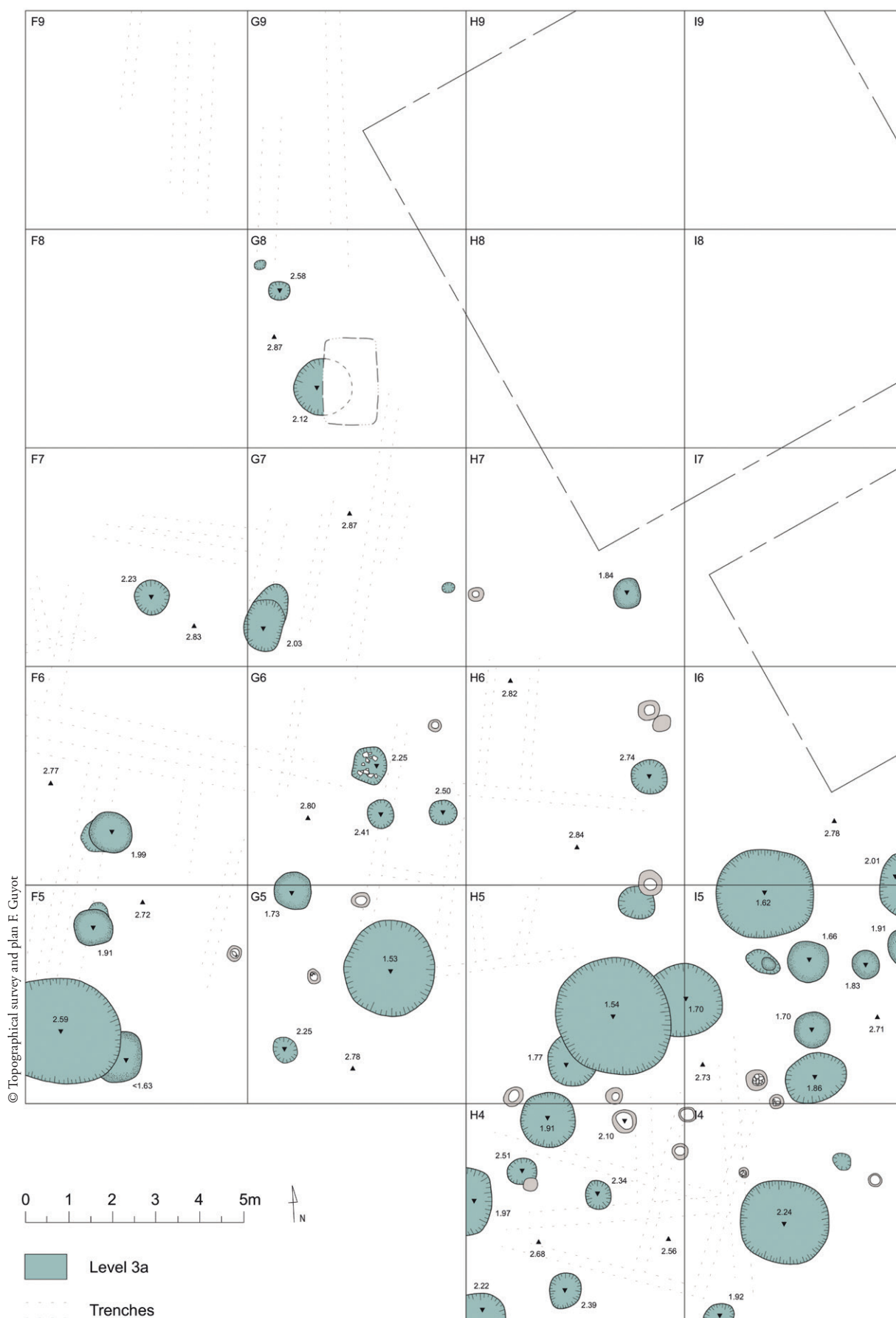
Building techniques were consistent with the remains excavated in Level 1.⁵³ More than a hundred fragments of fired clay with twig impressions demonstrate the wide use of wattle-and-daub as a building technique. Walls and fences were set into shallow and linear trenches in the same way as those found in the early settlement. Many of these long trenches have been identified in the various layers related to Level 3a (Fig. 20). They were between 15 cm and 30 cm wide and about 10–15 cm deep. The longest ones have been followed for over more than 7 m, but possibly extended further. Most of them intersected at right angles, leaving no doubt that

⁵³ This tends to confirm that they did not change much in layer 2, although evidence is missing.

extensive rectangular buildings were erected on the tell in the mid-fourth millennium BCE. In addition, series of trenches overlapped with a slightly different orientation, suggesting that several phases of construction did occur. Despite continued efforts, it has not been possible to complete the clearing of a whole group of interrelated trenches so as to draw the plan of a complete building. The two occupation layers related to Level 3a (layers 3 and 4), in which the shallow trenches were dug, have been repeatedly deflated, disturbed, and levelled when the settlement was inhabited. This explains why only segments of linear trenches (typically about 1–2 m long) and corners of rooms delineated by interrupted trenches were preserved even if the layers were nearly horizontal. The distribution of postholes found in the vicinity is of little help in this respect as they can be related to different phases of construction. Fifteen postholes coated with a thick layer of clay, often mixed with crushed potsherds, have been recorded in layers 3–4: very similar to those uncovered in the former levels, their base was regularly laid with large potsherds and broken stone tools to increase the stability of the pole (Fig. 23). A few additional postholes without clay coating have been evidenced in the same layers. The overall number of postholes seems nonetheless too limited in comparison with the many trenches, so it is likely that many uncoated ones have not been detected during excavations because their fills are so similar to the surrounding sediments.

The occupation layers related to Level 3a were coarser and darker in colour than those from Levels 1–2. In some locations, slight variations in soil texture and colour allow for differentiating at least two sub-phases of occupation, but everywhere else the layers have the same uniform aspect. This is most prevalent in the eastern part of area 1a (Fig. 21). The homogeneous aspect of the occupation layers, in addition to their relatively limited thickness even in Level 3a, made it difficult to identify stratigraphic connections between the remains uncovered in this level.⁵⁴ This thereby prevented any reconstruction of the respective layouts of the successive rectangular buildings. The structures in and around the buildings were, at any rate, quite few in number. No fireplace was found but scattered patches of hashes. Four silos were gathered in the south-eastern corner of area 1a, and two other in the south-western corner (Fig. 19: Sq. F5–F6, I5). They were similar in shape to those from former levels (0.8–1 m in diameter, 0.7–1.1 m in depth), and have been equally emptied before being abandoned, leaving no indication of how they were sealed. Their secondary fills also consisted of organic-rich black sediments mixed with numerous animal bones, potsherds, and flint tools. Ordinary pits were dug as well, some of which reaching considerable size in this level: up to 2–3 m in diameter and 1–1.2 m in depth (Fig. 18; Fig. 19: Sq. H5–I5). These extensive pits may have originally been made to extract clay-rich sediments for building activities of some sort. When dug they extensively damaged the underlying remains from Levels 1–2, but their fills yielded impressive quantities of pottery sherds, flint tools, and food-producing waste that provided insights into the economical practices and subsistence strategies of the mid-4th millennium BCE community.

⁵⁴ The numerous sections made during fieldwork did not provide much information in this respect: in most cases, the layers were too thin and too similar in colour to be followed from one square to another or from one structure to another.



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Investigating the Nile Delta's First Settlements: Excavations at Tell el-Samara 2016-2019

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FIG. 20. Ongoing excavations of occupation layers from Level 3a revealing long linear trenches in the south-western part of area 1, view to the north.

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FIG. 21. Clearing of the homogeneous Level 3a layers covering the sandy layers from Levels 1-2 (centre of the picture) in area 1a, view to the east.

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FIG. 22. Large pit with lateral niche from Level 2, reused in Level 3a (the Level 3a silo in the forefront was a later addition).

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FIG. 23. Level 3a posthole lined with clay and pottery sherds (Sq. H5).

The pottery repertoire from Level 3a is typical of the Late Neolithic 2 material culture that in Lower Egypt extended from the Nile Delta to the Fayum area. Similar assemblages are documented in many sites including Tell el-Farkha, Tell el-Iswid, Tell Ibrahim Awad, Minshat Abu Omar, Sais, Buto, and Girza to name but a few.⁵⁵ Among the most typical forms were: bowls with out-curving rim sometimes decorated with a row of impressed crescents or oblique dashes (Fig. 24d-g), small globular pots (Fig. 24c), ovoid pots with a marked neck (Fig. 24a-b), and large globular pots with a wide opening invariably decorated with impressed zigzag patterns (Fig. 24n-o). Jars typically had a short neck with a rounded rim, but vessels with a marked cylindrical neck and plain rim were also documented in significant quantities (Fig. 24i-l). Restricted forms with a marked carination below the rim started being produced at the end of the period (Fig. 24m). Larger vessels were used for the storage of water and foodstuffs, the most common of which were both wide containers with thick walls and rounded rims, and shallower forms with everted rims (Fig. 24q-r). Vessels were still made by coiling without the use of a turning device, and their surface was either burnished or wet smoothed.⁵⁶ These vessels were made locally from straw-tempered Nile clay. Imported jars made of marl clay started to occur in the assemblage from this period onward, albeit on a small scale (less than 1% of the whole assemblage). Another kind of ware, typical of Lower Egyptian culture, also came into use at that time. It consisted of a well-levigated Nile clay tempered with fine organic elements, the nature of which remains to be determined. Commonly referred to as fibrous ware this fabric was always burnished. It was used for producing a limited range of pottery among which were holemouth restricted vessels (Fig. 24p) and miniature pots (Fig. 24t).

Amidst pottery sherds, a clay fragment deserves to be mentioned. The fragment has an impression of basketry on its lower face and was probably part of a sealing applied on the lid of a basket (Fig. 25). The upper face of the fragment is flat. Despite its limited size (3 cm wide, 1 cm thick), it provides interesting information on basketwork, especially in the Nile Delta where the annual fluctuations of the water table are a major hindrance to the preservation of organic material.⁵⁷ Judging by the impression left on the clay, the basketry was mounted in a spiral: the start of the spiral and its first four turns are clearly visible on the fragment.⁵⁸ The coils were between 0.4 and 0.6 cm in diameter and were held by strands that were sometimes wrapped around the previous coil without touching the upright. The coils extended beyond the limits of the fragment, making it impossible to determine the diameter of the basketry. At any rate, the latter exceeded 5 cm in diameter. Impressions left by horizontal strings tied up in

⁵⁵ See respectively SOBAS 2012; MACZYŃSKA 2012; GUYOT 2015; VAN DEN BRINK 1992; KROEPER, WILDUNG 1994; KROEPER, WILDUNG 2000; WILSON et al. 2014; HARTMANN in press; STEVENSON 2009.

⁵⁶ Technological study of samples from the Level 3 assemblage has shown that the wet smoothing technique was mostly used for the production of globular pots with zigzag decoration (BAJEOT, ROUX 2019, pp. 165–170). The study also highlighted that the respective proportion of burnished and smoothed vessels can hardly be determined owing to the large number of ceramics having lost their original surface.

⁵⁷ While basketry and wickerwork are well documented in arid areas during the 5th millennium BCE as, for instance at Merimde (JUNKER 1930, p. 44, taf. 3) only some badly damaged specimens have been uncovered in the 4th millennium BCE settlements and cemeteries of the Nile Delta (HOCHSTRASSER-PETIT 2014, pp. 94–97).

⁵⁸ The study conducted by C. Hochstrasser-Petit showed that the basketry was a coiled basket in a single upright (BALFET 1952, figs. 3–4 type B.66). The starting mode was of type 36, radiating. The upright was rolled on itself and tied. The core of the spiral was not visible because the strand hides the frame. Commonly known as “Nubian basketry”, this manufacturing technique is documented at that time in both Lower and Upper Egypt (HOCHSTRASSER-PETIT 2005, p. 55). The nature of the plant fibres used has not been determined.

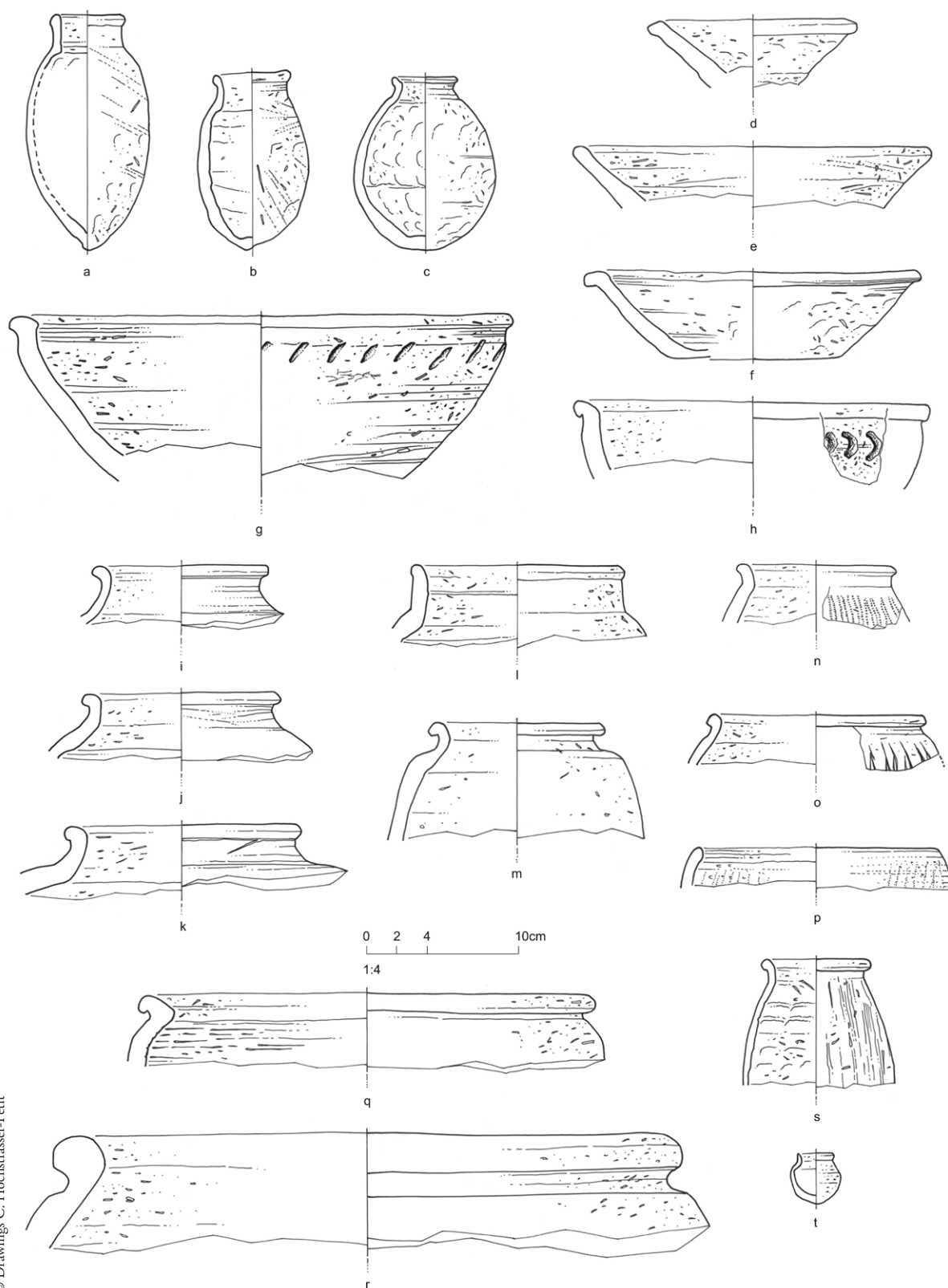


FIG. 24. Pottery assemblage from Level 3a.

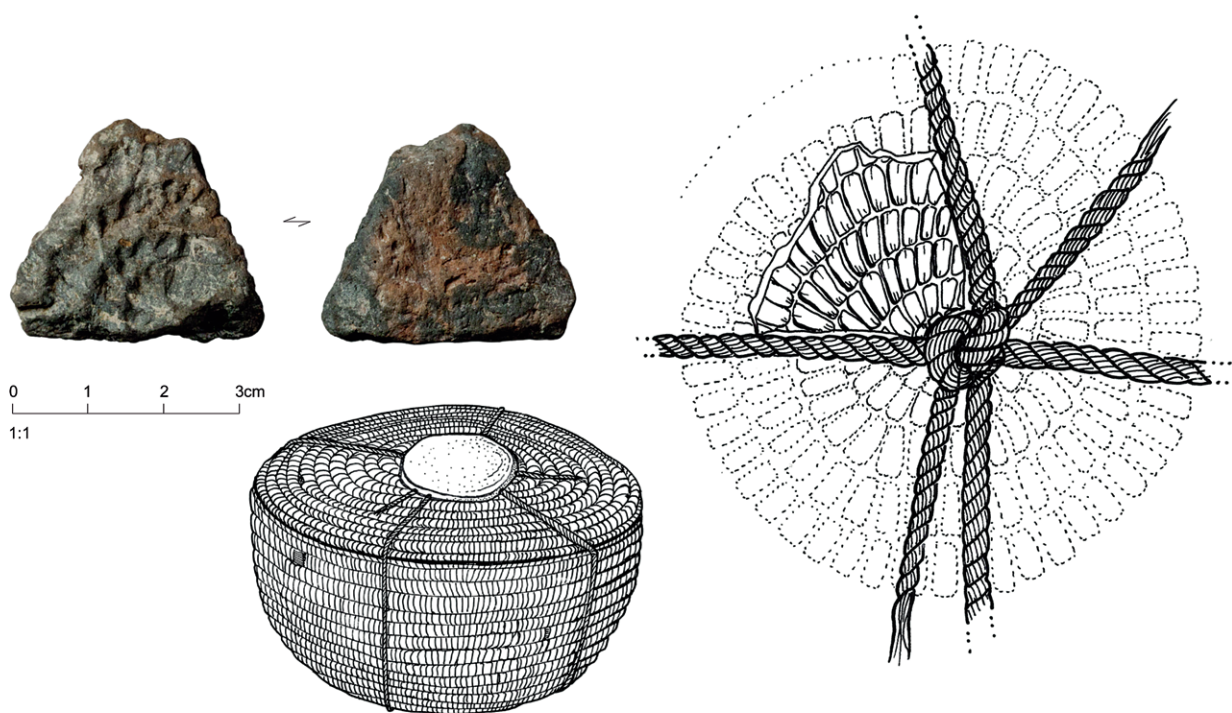


FIG. 25. Fragment of fired clay with an impression of basketry from Level 3a.

a knot can be observed on both lateral sides of the fragment.⁵⁹ It can therefore be inferred that the container was probably closed by a coiled disk-shaped basketry, attached by intertwined strings held against the lid by a clay sealing.

When comparing the remains from Level 3a with those from the contemporary settlements in the Nile Delta it can be seen that a number of architectural features are lacking from the archaeological record at Tell el-Samara. Breweries for instance have been uncovered at Tell el-Farkha, Tell el-Iswid and Buto in occupation levels roughly similar in date.⁶⁰ A dozen of fragmentary firedog bricks, typical of these kinds of facilities, were nevertheless found in area 1a, suggesting that a brewery was possibly built in the vicinity. Evidence for early mudbrick architecture is also missing at Tell el-Samara, whereas large mudbrick enclosure walls were built at the end of the Late Neolithic 2 period in the neighbouring settlements of Tell el-Fakhra and Tell el-Iswid.⁶¹ The question then arises as to what extent area 1 can be regarded as representative of the 3500–3300 BCE village of Tell el-Samara. As seen in the western section of area 1a (Fig. 5: Sq. F5–F9), Level 3a deposits were much thicker in the southern part than in the northern one. In addition, the density of Level 3a remains was markedly greater in the

⁵⁹ Strings were made of two fibre yarns, spun in a Z direction, before being plied in a S direction (WENDRICH 1994, pp. 36–37, type zS2). The knot was a simple, overhand knot (BUDWORTH 2011, p. 31). Closing a vessel with such a lid would have required handles to tie the strings. Considering that very few potteries from the Late Neolithic 2 assemblage had handles, it is more likely that the container closed by the lid was a basket (which explains the choice made for the artist reconstruction illustrated in Fig. 25).

⁶⁰ CHŁODNICKI, GEMING 2012, pp. 99–103; HARTUNG et al. in press; N. Buechez personal communication.

⁶¹ CHŁODNICKI 2011, pp. 49–48; BUCHEZ et al. in press.

southern part of area 1a, while they were absent from area 1b (even considering that the layers were heavily deflated in the north, bottoms of pits or silos should have been visible, which is not the case). It is therefore possible that the heart of the settlement was located further south, while the area excavated so far was nothing but a peripheral, loosely inhabited part of the village. Further fieldwork will aim at testing this possibility by carrying out a series of auger drilling tests along a north-south axis from the top of the tell.

2.4. Level 3b, Late Neolithic 2 (c. 3300 BCE)

Some time after this part of the settlement was abandoned (but not necessarily the whole village), the area was turned into a burial ground as indicated by a group of six tombs dug near the south-eastern corner of area 1a (Fig. 28: Sq. H4–I5). All of these burials intersected either pits, trenches or silos from the former occupations, which provides stratigraphic evidence for considering them as a later sub-phase of Level 3 (Fig. 4). Due to the limited number of burials uncovered so far, it cannot be stated whether they were part of a larger cemetery extending beyond the limits of the excavated area. But at the same time, it cannot be excluded that a link did exist between these burials and the Early Dynastic graves dug nearby some 300 years later (in other words that the late 4th millennium BCE cemetery was already in use at that time). This hypothesis remains however unlikely since several mudbrick buildings had been erected in the same area in the meantime (see below). Eastward extension of fieldwork in the forthcoming seasons will aim at assessing whether this part of the tell was continuously occupied by a burial ground from this period onward.

Late Neolithic 2 burials were mere oval pits with uneven and frequently unclear limits. They were 50–80 cm deep so that the bodies were always laid on the virgin sand of the *gezira*. In all but one instance (Fig. 26), the human remains were poorly preserved: only the long



Fig. 26. Late Neolithic 2 burial in area 1a (Sq. I5).

bones and parts of the skull were still recognisable, whereas the rest of the body was reduced to a formless mass of bone splinters. As far as could be determined, bodies were buried in flexed position on either the right or the left side. They were broadly oriented toward the east. The degree to which the bodies were contracted varies from one burial to another, but it is likely that they have all been manipulated *post mortem* to force them into a foetus-like position. Variations can be noticed in the position of the hands (i.e. below the chin, against the face), although the poor preservation of human remains prevents any further exploration of the issues of body treatment and funerary practices. No evidence of mats or animal skins in which the bodies were possibly wrapped has been found. Despite the cautious sieving of the filling from each burial, no grave good was found next to the bodies, which were additionally deprived of personal ornaments.

Such a low investment in funerary offerings was a distinctive feature of Lower Egyptian cemeteries. Whether in the 5th millennium BCE cemeteries at Merimde and el-Omari, or in the slightly later ones at Heliopolis, Kom el-Khilgan and Minshat Abu Omar (early and mid-4th millennium BCE), tombs invariably contained little or no grave goods.⁶² On the contrary, funerary practices in Upper Egypt put great emphasis on the individual dimension of funerary offerings and the bodies were often buried with a significant number of personal belongings. In addition, a process of ostentatious accumulation of a great deal of wealth in the graves of the most prominent individuals started to emerge in the south by the mid-4th millennium BCE.⁶³ In Lower Egypt distinction between burials in terms of wealth and social status remained fairly limited, even in the Late Neolithic 2 cemeteries. It was not until c. 3100 BCE that some graves, like those excavated by MoTA in the early 2000s at Tell el-Samara, clearly stood out from the others owing to their larger size and the unprecedented amount of funerary offerings they contained. These changes in the burial customs of Lower Egyptian communities are widely viewed as a direct effect of the increasing influence Upper Egyptian culture had on northern populations. The emergence of new modes of production and the development of mudbrick architecture, as can be observed in Level 4a, are often regarded as resulting from the same phenomenon.

2.5. Level 4a, Protodynastic (c. 3300–3100 BCE)

The settlement pattern changed drastically at the beginning of the Protodynastic period. Dwellings made of wattle-and-daub were superseded by large mudbrick buildings extending over area I in a north-south orientation. Only parts of these buildings have been excavated so far in area Ia, revealing a series of adjoining rectangular rooms arranged around what seems to have been a courtyard (Fig. 27).⁶⁴ The walls are heavily eroded and no more than one or two courses of mudbricks have been preserved. Brickwork is nonetheless indicative of an already well-developed masonry technique: mudbricks made of pure clay without straw temper were regularly shaped (24 × 11 × 6 cm on average) and laid out in alternative courses of headers and

⁶² KROEPER 2004, pp. 859–860; BUCHEZ, MIDANT-REYNES 2011, pp. 840–841.

⁶³ FRIEDMAN, VAN NEER, LINSELE 2011, pp. 159–162.

⁶⁴ See also GUYOT, HOCHSTRASSER-PETIT forthcoming, Fig. 1.



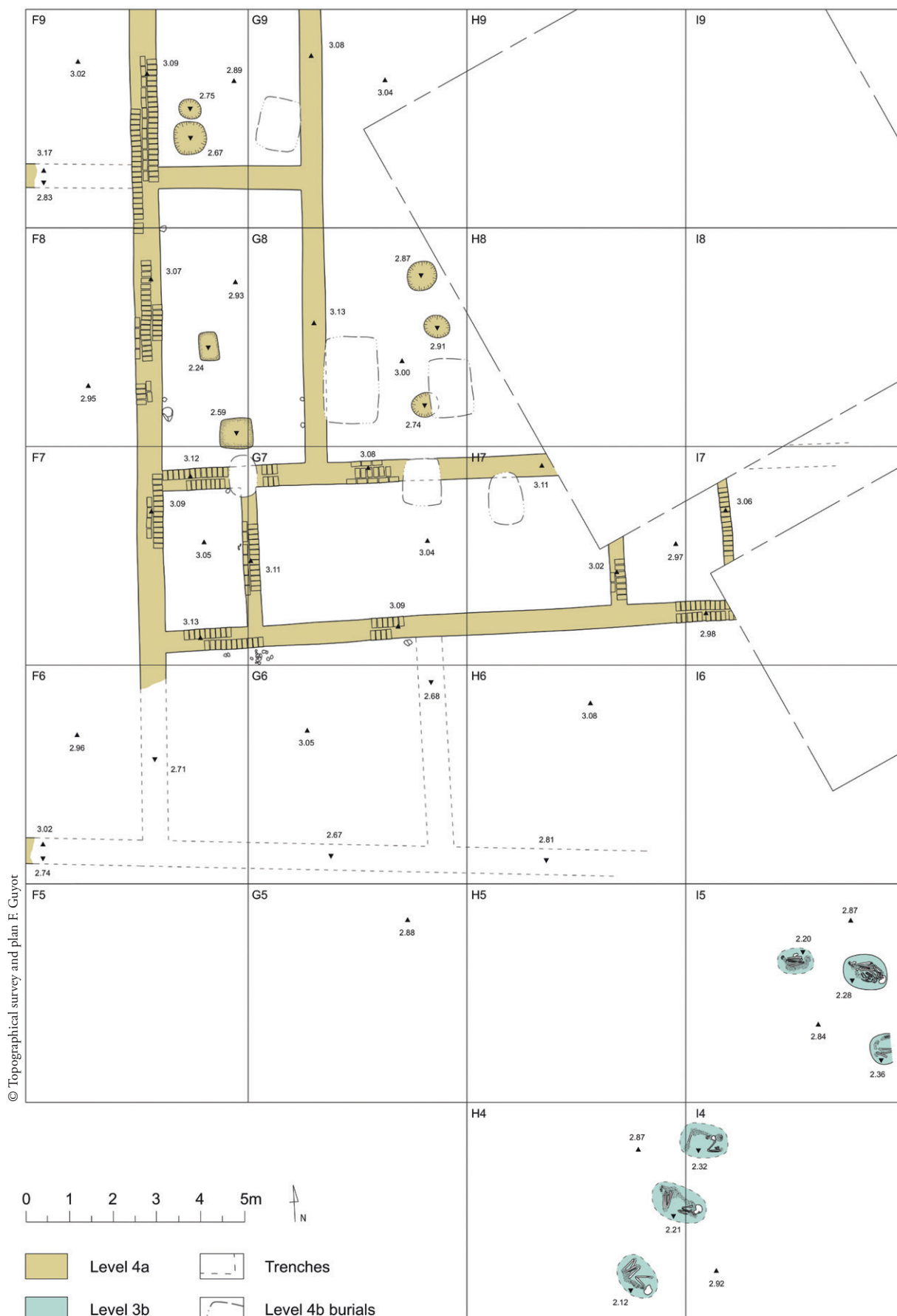
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FIG. 27. Area 1a at the end of the 2018 season, view to the north.

stretchers.⁶⁵ Walls ranged from one brick to two bricks and a half in width, which allows us to distinguish between main bearing walls and dividing walls.

The long wall running north-south over more than 15 m was two bricks and a half wide (Fig. 28: Sq. F7–F9). Considering that the rooms were delineated by thinner walls (two bricks wide), this long wall was probably an external wall delimiting an architectural complex that extended further east. Two rectangular rooms along the same axis were built at a later stage against this wall: one was 6.5 m long, the other has not been fully excavated but was presumably similar in length. Both were 3.25 m wide, which is consistent with the other rooms excavated in the architectural complex. The regular width of the rooms suggests that a measuring system (with a rope or a rod?) was used for establishing the construction lines of the buildings. Moreover, it may be observed that the length of the fully excavated room was exactly twice its width, raising the possibility that the whole complex was laid out according to a grid with predetermined measurement units. However, the width of the rooms may also have been limited by

⁶⁵ Similar construction techniques and mudbrick modules are documented in virtually all the lower Egyptian settlements from the Protodynastic period onward (see notably ADAMS 2009, p. 130; CIAŁOWICZ 2012b, pp. 163–166; MIDANT-REYNES et al. 2014, pp. 41–43; HARTUNG, ENGEL, HARTMANN 2012, pp. 89–90; HARTUNG et al. 2016, pp. 78–83). Although prevalent in other contemporary sites, the sandy mudbricks (soft and yellowish in colour) were not used at Tell el-Samara for some unknown reason. The buildings were constructed solely with grey mudbricks made of pure clay, which tend to dry very quickly after having been exposed to the sun. Their surface cracks as it dries, making the joints between the mudbricks often difficult to spot. This explains why only a few bonds have been identified during fieldwork and reported on the plan. The layout of the mudbricks (headers and stretchers) may vary in a single course, which is also reported in many other contemporary sites.



the maximum span of the wood timbers used as joists for supporting the roof. A significant enlargement of the excavated area would therefore be required to investigate this issue further.

Rooms were fitted with uncoated pits, which were shallow and round in one room and deep and rectangular in the other. This probably implies that these pits had a distinct but unclear function. The rectangular pits were filled with almost pure sandy sediments and contained only a few sherds. Although their depth would tend to relate them to storage activities, there is for now no definite evidence as to their use (the archaeobotanical study of their content may nevertheless provide some insights in this respect). More generally, the archaeological material found in the buildings was both scarce and uniform, thereby providing little information on the way the various economic activities were organised inside the architectural complex. Likewise, the living floors were not distinctive enough in colour and texture from the layers around to be clearly identified: only some potsherds stuck against the walls or in the corners of the rooms were indicative of their elevation. No evidence of mud plaster has been found on the floors, or on the walls. The location of the doorways could not be determined as no disruption in the bonding of the mudbricks has been observed in the preserved courses. It is thus very likely that the thresholds set in the masonry were opened above the third course of mudbricks.⁶⁶

In the central part of area 1a at least three rooms in a row ran toward the east perpendicularly to the outer wall (Fig. 28: Sq. F7–I7).⁶⁷ They too were 3.25 m wide, but their length ranged from 1.8 m to 8 m. The partition walls varied from one brick and a half to one brick wide. Interestingly, this row of rooms was not perpendicular to the outer wall but shifted slightly towards the north (which incidentally indicates that they were all constructed at the same time). The study of the bricks bonding at the junction with the outer wall would have helped in determining whether this row of rooms was a later addition. Regrettably the brickwork is insufficiently preserved in this location. It can nevertheless be noted that no traces of pre-existing walls has been found below these rooms, which seems to indicate that the latter were not related to a second building phase during which the inner layout of the building was altered. The five rooms were probably set around a large open space extensively obliterated by previous excavations. In the preserved part, three shallow pits about 60 cm in diameter were dug into the floor. Their walls were heavily fired and they were filled with very ashy dark sediment. It is tempting to interpret them as fire-pits for baking bread, although no particularly high concentrations of bread moulds was found around those pits to corroborate this hypothesis.⁶⁸

The southward expansion of the building is unclear because the bricks were totally fused together in this section and it has not been possible to identify walls within the destruction layer (Fig. 5: layer 9). However, foundation trenches related to those walls were distinctly visible on the Level 3a dark brown soil into which they were dug (Fig. 29). They were about

⁶⁶ The break visible in one of the walls on Fig. 27 was not a doorway but a destruction caused by a burial dug during phase 4b (see Fig. 4: Sq. G7).

⁶⁷ Another room was probably located further east in Sq. I7 since it is very unlikely that the building ended at that location with a wall only one brick wide. The latter was probably a dividing wall delimiting a side-room adjoining a larger broad room, in the same way as the couple of rooms in Sq. F7–H7.

⁶⁸ It is known from archaeological, iconographic, and textual evidence that in the late 4th–early 3rd millennia BCE bread dough was poured into shallow conical moulds sunk into the ground then covered with combustible material for baking (see HENDRICKX et al. 2002, pp. 294–297).



FIG. 29. Trenches from the Protodynastic architectural complex appearing against the dark soil of Level 3a occupation layers, view to the east.

the same size as the walls (i.e. 50–70 cm wide) and were filled with a packed clay-like material, mixed with fragments of mudbricks and some pottery sherds that leave little doubt as to their date. One of them was in the continuity of the outer wall, while the second one was perpendicular to it.⁶⁹ Although evidence is admittedly scant, these trenches could therefore mark the southern limit of the architectural complex. A third trench (Fig. 28: Sq. G6) was perpendicular to the above mentioned row of rooms and delineated two sub-rectangular spaces.⁷⁰ The sizeable width of these spaces (minimum 4.5 m) suggests that both were probably open spaces. Two more trenches can be seen in the western section of area 1a (Fig. 5: Sq. F6, F9). Their link with the outer wall is unclear, but stratigraphic evidence indicated that the southern one was later.⁷¹ They were probably the remains of a wall built at a later stage for connecting the architectural complex with some other building(s) in the west.

⁶⁹ In Fig. 20, the bottom of the trench was left unexcavated for technical reasons, which explains why it looks like some kind of wall. The differential drying of the filling of the trench compared to the soil around makes it nonetheless quite visible in the section, just below the outer wall. Similar trenches were found in the northern part of area 1a when dismantling the other walls of the building to explore earlier levels.

⁷⁰ The trench being perpendicular to the aligned rooms, its orientation was also slightly different than the orientation of the outer wall. This could indicate that the wall it supported was built together with the aligned rooms, but not with the outer wall.

⁷¹ The trench in Sq. F6 of the western section is also clearly visible on Fig. 1. On Fig. 29 the trench of the proposed outer wall of the complex shows a slightly rounded corner. The trench coming from the section in Sq. F6 is not visible in the picture because its bottom is less deep and has already removed.

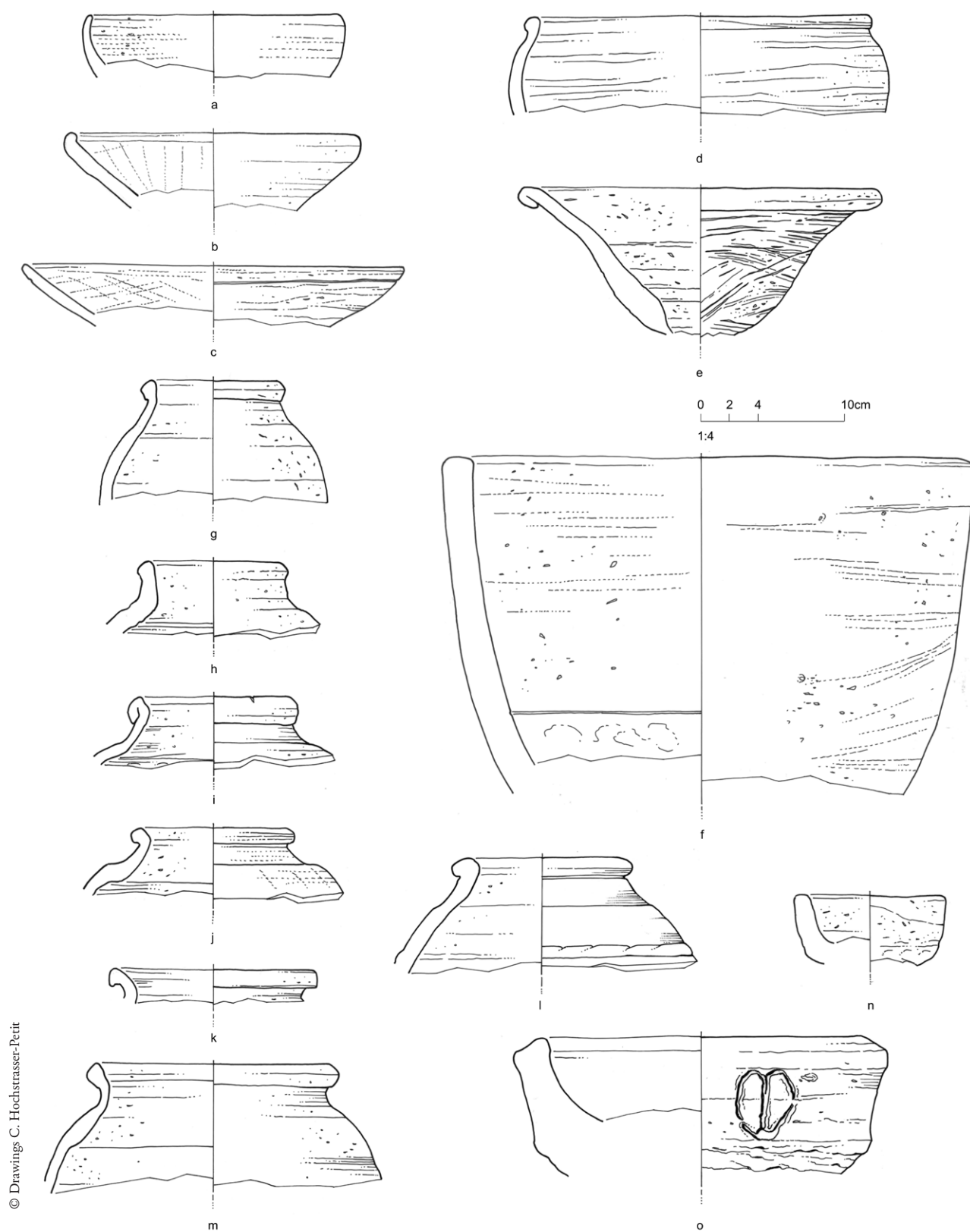
Mudbrick walls with similar orientation, width, and construction techniques have been uncovered in area 1b. They were probably part of the same architectural complex, although this assumption cannot be confirmed in the present state of fieldwork because former excavations disrupted stratigraphic connections between area 1a and 1b (Fig. 4). Two building phases can be identified in area 1b. During the first phase, a large open-space in the east bordered four broad rooms (Fig. 9b). In the northern room, a large storage jar with a wide opening was sunk into the ground, penetrating deeply into the sand of the *gezira* due to the limited thickness of archaeological deposits (Fig. 11). Its opening, at the same elevation as the floor of the room, was surrounded by a crown of large pottery sherds and stones. To the south was a room 3.7 m wide fitted with two postholes.⁷² Carefully coated with a thick layer of clay mixed with crushed potsherds and lined with fragments of grinding stones, both postholes were located just at the mid-width of the room. They were most probably intended to hold the pole supporting the cross beam upon which were set the joists.⁷³ A large amount of potsherds was stuck against the corners of the room and along the walls, amidst thick ashen refuse from fireplaces. In the southern part of area 1b there were two additional rooms that have been excavated only over a very limited surface. During the second building phase these rooms were replaced by a long wall delineating a large, probably open area in the south-west (Fig. 9c). The new wall was erected almost completely above the former one but with a slightly different orientation. The layout of the building was unclear to the north and east of the latter wall since the area have been heavily disturbed by Early Dynastic graves and extensively flattened by modern activities. A segment of wall was nonetheless visible near the north-east corner of the area, suggesting that more rooms were built further north.

The pottery assemblage from Level 4a contrasted markedly with the former Neolithic repertoires, both in terms of pottery shapes and fashioning techniques.⁷⁴ Typical of the Protodynastic period were burnished bowls with straight walls and rims curving slightly inwards (Fig. 30a-b), or more restricted in shape with rounded rims (Fig. 30c). In many cases, the traces left by the polishing tool are visible on the surface. Equally typical of the ceramic material related to the mudbrick buildings were some specimens of large vats covered with an unburnished red slip (Fig. 30f). Among the medium-size containers, jars with short conical necks and marked rims were most frequent (Fig. 30g). Fragments of jars with out-turned rims ("wine" jars) occurred sporadically (Fig. 30k). Some imported jars in marl clay are also to be mentioned (Fig. 30i). The pottery assemblage from the layer that covered the remains of the architectural complex (layer 10) was markedly different and contained vessel shapes typical of the 1st Dynasty. Among the latter were burnished bowls with straight walls and linear incisions below the rim (Fig. 30c), jars with short everted neck (Fig. 30h), and jars with wide opening and everted rim (Fig. 30m). Jars with carinated neck (Fig. 30j) and jars with rope-like decorations on the shoulder (Fig. 30l) were also recorded, although in small numbers. A single specimen of a large vat covered with an unburnished white slip (Fig. 30e) was found

⁷² The fact that this room was slightly wider than the rooms excavated in area 1a might indicate that it was part of a separate building.

⁷³ Both postholes were probably not in use concomitantly, but stratigraphic connections were not clear enough to determine which was used first. At any rate, none of them seems to be related to the second building phase.

⁷⁴ A similar change in the pottery tradition is documented at the same period in every lower Egyptian settlement and cemetery. See for instance BRÉAND 2015, pp. 38–42; HARTMANN 2016, pp. 91–104; 20p. BAJEOT, ROUX 2019, pp. 173–174.



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FIG. 30. Protodynastic and Early Dynastic pottery assemblage.

just below the top soil. Bread moulds of various sizes and shapes (Fig. 30n-o) were ubiquitous in both Protodynastic and Early Dynastic levels.

Excavations in areas 2 and 3 revealed that many more mudbrick buildings were erected in the western and eastern parts of the tell.⁷⁵ Continued fieldwork is needed to clarify not only the distribution of mudbrick architecture over the tell, but also the spatial organization of the settlement as a whole. Evidence is for now too limited to assert that a drastic change in the extent of the settlement did in fact occur between the Late Neolithic 2 and Protodynastic periods. The areas where mudbrick buildings have been uncovered were all formerly occupied by ephemeral wattle-and-daub architecture and the emergence of large architectural complexes does not necessarily imply a significant increase in the density of population. However, the constant north-south orientation of the buildings in addition to the similarities in their layout bear witness to the gradual shift toward a more organized settlement pattern and the onset of a “proto-urban” village life.

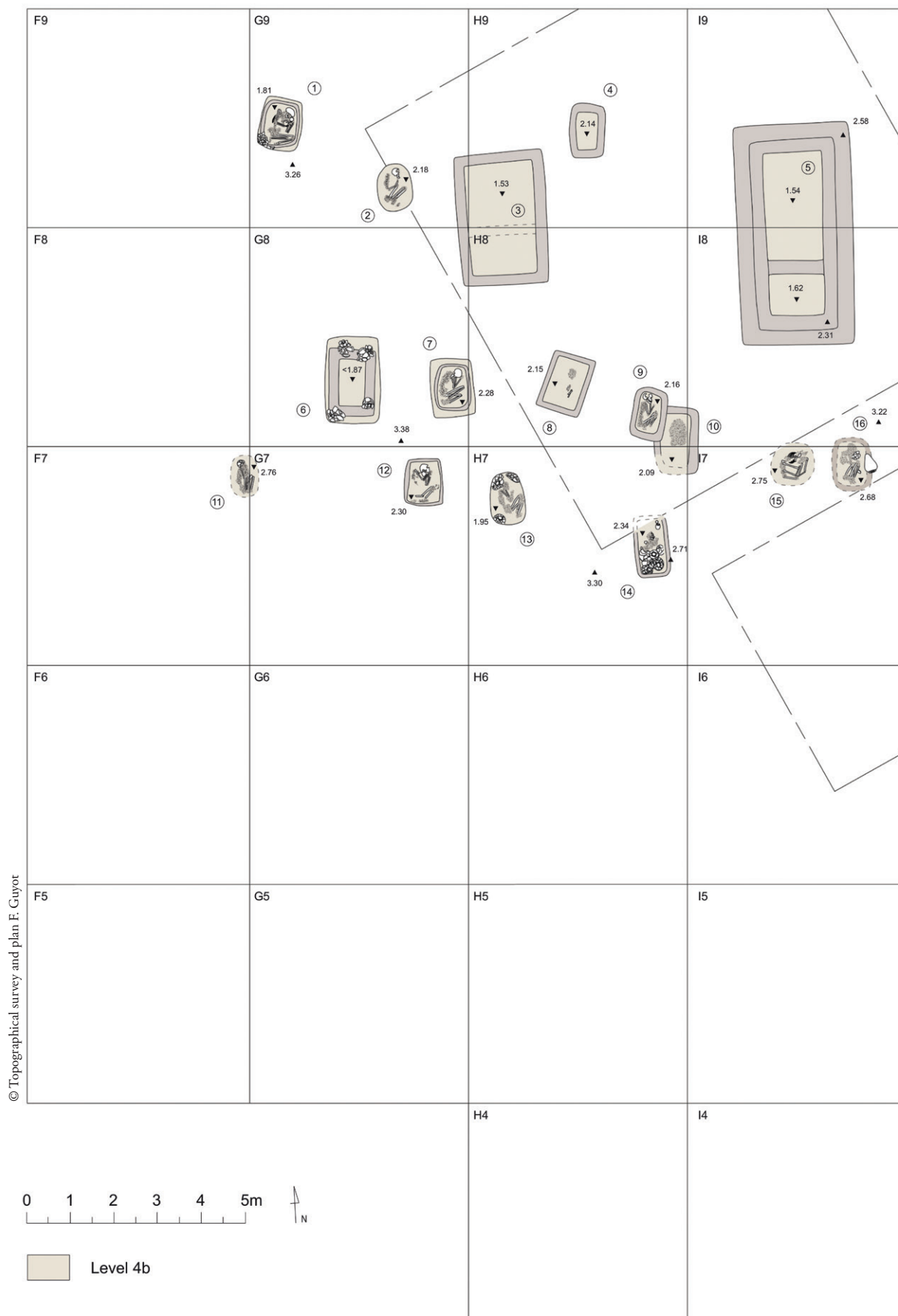
2.6. Level 4b, Early Dynastic (c. 3100–2900 BCE)

At the turn of the fourth and 3rd millennium BCE an extensive cemetery developed in the south-eastern part of the tell. The graves excavated at the western limit of the cemetery after the former mudbrick buildings were abandoned are the latest archaeological remains found in area 1. They differed significantly from the Late Neolithic 2 burials and evidenced drastic changes in burial customs occurring at the end of the 4th millennium BCE. Graves were consistently oriented to the north. The bodies lie in a flexed position on the left side, the head to the north, the face to the east, with the hands either in front of the face or below the head.⁷⁶ A total of 25 Protodynastic graves have been excavated in area 1 (Figs. 9c, 31). Eight of them had been formerly excavated by MoTA in the early 2000's and two others have been cleared only partially.⁷⁷ Three different kinds of burials can be distinguished: 1) large rectangular graves with

⁷⁵ In area 2 several mudbrick walls have been cleared in the lowest layers reached during the 2019 season. They were similar in orientation and building techniques to those excavated in area 1a, but better preserved. The ceramic and lithic material coming from the related layers (about 30 cm thick) was similar as well. In area 3, remains are more eroded. Three walls delimiting a rectangular room 3.30 m wide have been uncovered (related occupation layers were about 10 cm thick). In both areas, the pottery assemblage related to the buildings argues for a Protodynastic date. Direct stratigraphic connections (through a series of transects connecting areas 2, 1 and 3 for instance) are nevertheless needed to determine whether these buildings were strictly contemporaneous.

⁷⁶ Human remains were, however, as badly preserved as those from Level 3b, which made it difficult to further address the issue of burial practices.

⁷⁷ For the sake of clarity, an artificial numbering running from 1 to 25 is used here to refer to these graves (since during fieldwork many discontinuous loci numbers were given to the different parts of each of the graves). The tombs previously excavated by MoTA are graves 3–5, 8–10, 18, 24, while the two ones only partially excavated are graves 6 and 17. As mentioned above, these graves intersected mudbrick buildings from Level 4a in many locations: in area 1a, graves 6, 11, 12, 13 have been dug through mudbrick walls, while grave 7 intersected one of the pits in the courtyard (Figs. 3, 28). In area 1b, grave 25 cut a wall related to the second building phase, while another wall belonging to the same phase was partially destroyed by the pit excavated for the construction of grave 18 (Fig. 9c). The surface layers having been heavily deflated by modern activities and disturbed by many burrows, the original elevations of the openings of the graves are difficult to determine. The elevations reported on the plans are the elevations at which those openings were identified during fieldwork. In addition, it has not been possible to determine stratigraphic connections between the openings of the different graves. The pottery offerings deposited in some of the graves are indicative of a 1st Dynasty date, while only a few graves yielded 2nd Dynasty vessels. However, in



mudbrick lining fitted with a subsidiary compartment for funerary offerings at their southern end; 2) medium-size graves, rectangular or sub-rectangular in shape, lined with mudbricks or clay but deprived of subsidiary compartment; and 3) plain oval or rectangular pits.⁷⁸

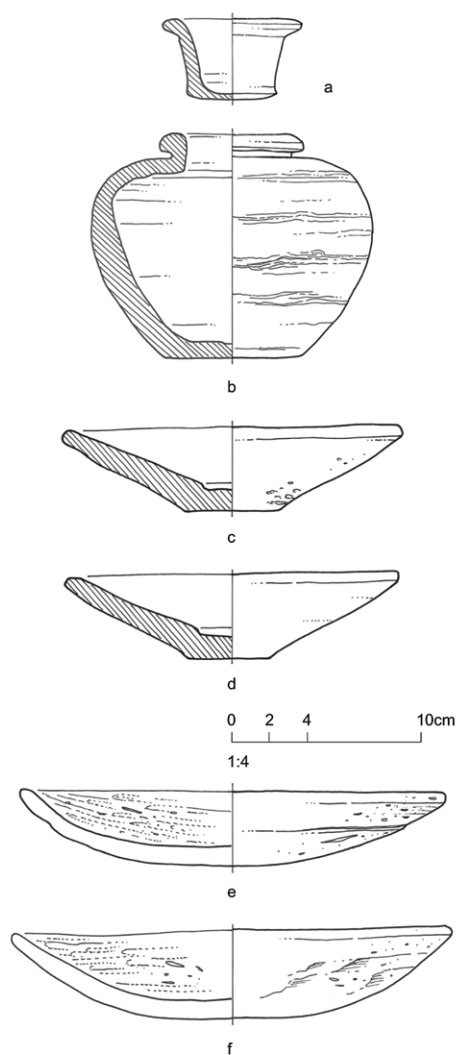
Located in area 1b, grave 25 was the only grave with a mudbrick lining and a subsidiary compartment excavated during the 2016–2019 seasons (Fig. 32). The mudbrick lining of the grave and the dividing wall are strikingly bent. Moreover, the funerary offerings deposited in the compartment were partly stuck into the masonry, which somehow disintegrated over them. Lastly, although the constant width of the lining indicated that the latter was one brick wide, it has been possible to identify only a few joins. A possible explanation could be that the mudbricks were not dry enough when they were used to line the grave. Subsequently, mudbricks were packed under the pressure of surrounding soils and the fill inside the grave, causing the walls to buckle. It may also be noted that the lining was only about 40 centimetres high, while the grave was more than 60 centimetres deep. In other words, the mudbrick lining did not extend up to the opening of the tomb, but stopped 20 centimetres below the top soil. This point is relevant since a calcite alabaster lid and a pottery plate were stuck into one of the upper corners of the grave, near the top of the mudbrick lining (Fig. 32a). The pot made of calcite alabaster that matches the lid has been found at the bottom of the grave, just behind the head of the deceased (Fig. 32b), next to a plate made of the same stone (Fig. 32c). This suggests that a series of ceremonial acts may have been performed during the funerals. Once the body was deposited in the main chamber, solid offerings (probably foodstuffs) contained on the stone plate and liquid offerings (scented water, wine?) contained in the pot were poured on it. Then both vessels were placed near the head of the body before the burial chamber was filled with sandy sediment free from intrusive material. Judging by the homogeneity of the fill in both parts of the grave and its continuity above the partition wall, the burial chamber and the subsidiary compartment were probably filled at the same time. A second series of ceremonial acts could have occurred at that point, as indicated by the pottery plate and the lid discarded in a corner of the grave, just above the first filling. Then the grave was entirely covered. Owing to the removal of the top layers, it has not been possible to determine whether the grave, like the other graves in the cemetery, was provided with a superstructure at the ground level. The vessels placed in the southern compartment were typical offerings from the 1st Dynasty and included three beer jars (Fig. 32g-i), one of which was closed by a calcite alabaster plate turned upside down (Fig. 32d) and two pottery plates (Fig. 32e-f).

A few meters north, grave 22 was illustrative of the second kind of grave, smaller and deprived of a subsidiary compartment (Fig. 33). The body of a young individual was laid in an extremely contracted position just above the virgin sand of the *gezira*. Interestingly, every grave in the cemetery was deep enough to reach the *gezira*, so that the bodies were always laid directly on the virgin sand, possibly for symbolic reasons.⁷⁹ Behind the head of the body were

many other cases the ceramic assemblage was too limited to be diagnostic. Owing to the lack of stratigraphic connections these graves should therefore be considered as 1st–2nd Dynasty in date. The graves from the Early Dynastic cemetery will be presented in detail in a forthcoming paper.

⁷⁸ To the first type were related graves 3, 5, 24, 25 (although markedly smaller than others), and probably 17. To the second type were related graves 1, 4, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20, 23. To the last type were related burials 2, 11, 13, 15, 19, 21, 23.

⁷⁹ The only exceptions were the shallower graves 11 and 15, in which the bodies were buried in occupation layers related to Level 3a. Both graves however differed from the others by a low investment in their layout and a lack of funerary offerings.



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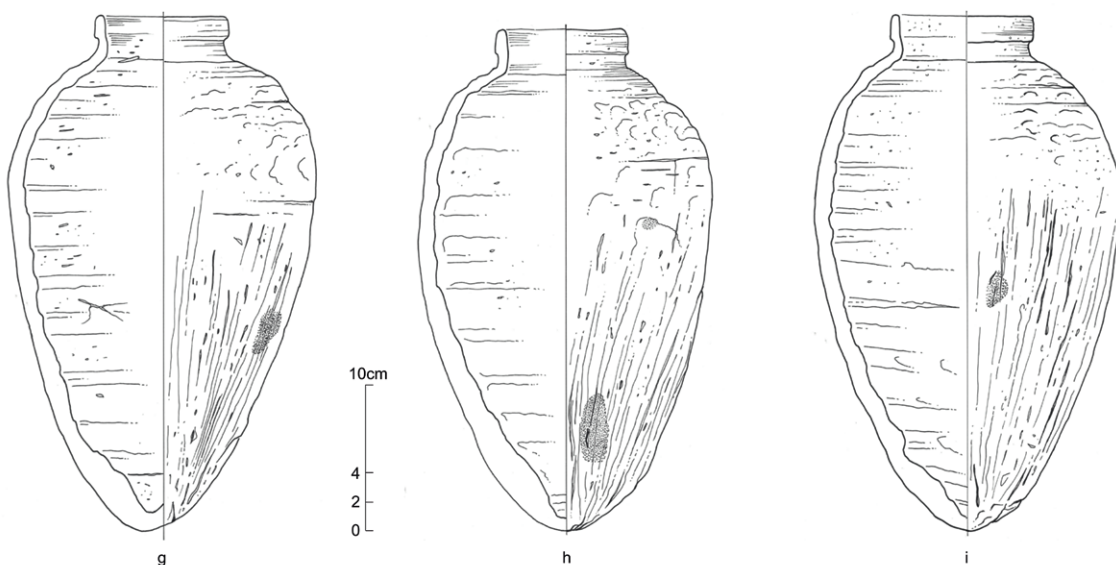


FIG. 32. Early Dynastic grave 25 in area 1b, view to the north.



FIG. 33. Early Dynastic grave 22 in area 1b, view to the east.

placed a bronze spear head,⁸⁰ an oval slate palette next to a raw piece of ochre bearing use-wear traces, a bi-conical object made of soft stone looking fairly similar to a mace head, and a rectangular object in graywacke equally showing extensive traces of use (Fig. 43f). It is likely that the empty space in the southern part of the grave was originally occupied by a basket or a wickerwork of some sort that has completely disappeared due to the high humidity and the fluctuations of the water table. Compared to the thick mudbrick lining covering the walls of grave 25, the lining of grave 22 has been done *a minima*. It was composed of three courses of stretchers delimiting a narrow space, and did not extend higher than what was necessary to protect the body and the few surrounding offerings. A comparable layout can be seen in many other graves like, for instance, graves 1, 6, and 7 (Fig. 31: Sq. G8–G9). The latter comprised two superimposed rectangular pits: the upper one was deep and unlined, whereas the lower one in which the body was buried was narrower, much shallower, and lined with either mudbricks or lumps of clay. In each of these three graves the upper pit was about 1.30–1.50 m deep and was filled with mixed sediments and pottery sherds coming from the various layers into which the graves were dug. By contrast, the lower pit contained only fine sandy sediment without intrusive material. It is worth noting that in graves 1 and 6 funerary offerings were deposited at the bottom of the upper pit in exactly the same way as in grave 25. In grave 1, the upper pit

⁸⁰ A similar spearhead is notably documented in the Protodynastic–Early Dynastic cemetery of Kafr Hassan Dawood (ROWLAND 2014, p. 284).

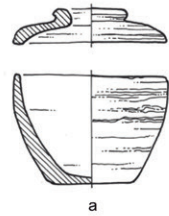


FIG. 34. Early Dynastic grave 1 in area 1a, view to the east.

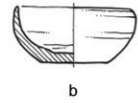
intersected a silo and a shallow pit from Level 1 (Fig. 8: Sq. G9; Fig. 34).⁸¹ At the bottom, a second pit was opened, only 40 cm deep, coated with clay (the lumps of clay used for the lining subsequently disintegrated over the body covering the bottom of the lower pit with a thick layer of clay). A stone plate and a pottery jar found crushed above the lining were probably the remains of funerary practices performed once the burial chamber had been closed, but before the grave was completely filled. Their elevation further indicated that the clay lining did not rise much higher than the preserved elevation. Grave 6 showed a remarkably similar pattern with four pottery jars and two plates deposited above the lining of the lower pit, which in this case was made of mudbricks. The many occurrences of such vessels placed at the bottom of the upper pit before the closing of the grave support the view that depositing funerary offerings in several steps was a recurrent funerary practice.

Many graves of the second type consisted of a single pit, the lower part of which was coated with lumps of clay arranged in several layers as indicated by the markedly rounded corners of the lining. This is especially apparent in grave 14 (Fig. 31: Sq. H7) and grave 20 (Fig. 9c: Sq. L10). A child was buried in grave 14 (Fig. 35). Unlike adults, the child was laid in the width of the grave with the head resting inside a large ceramic bowl, possibly broken during the funeral (Fig. 35h). Between the legs were a pot made of calcite alabaster composed of two parts

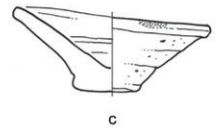
⁸¹ The grave looks less deep in Fig. 34, because the photograph was taken after the clearing of Level 1 layers. Also visible in the photograph is the line incised in the wall of the silo that marked the elevation at which the rainwater had stagnated several days after the heavy rainfall in March 2019.



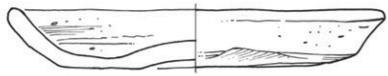
a



b



c



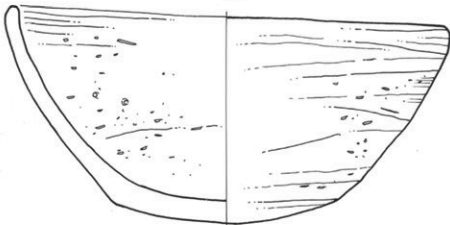
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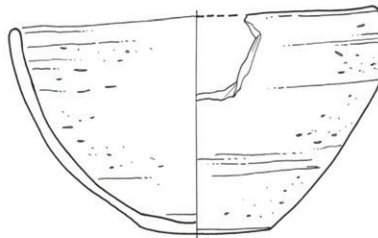
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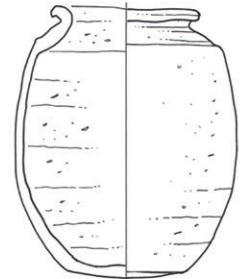
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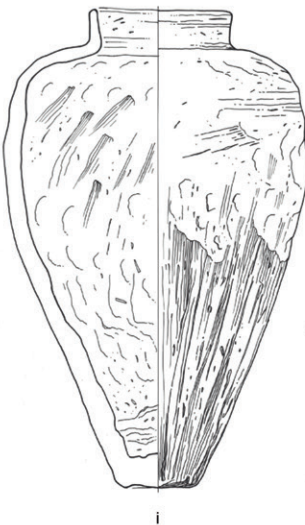
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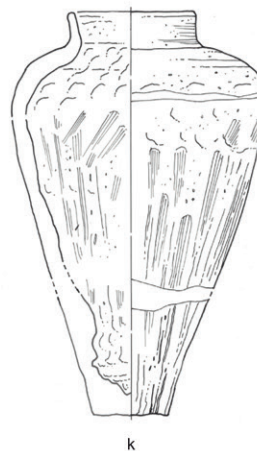
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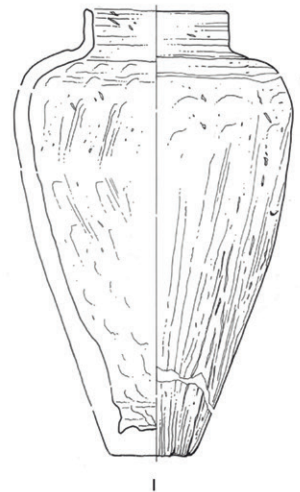
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FIG. 35. Early Dynastic grave 14 in area 1a, view to the west (the northern part of the grave was cut during MoTA excavations).

glued together with bitumen (Fig. 35a) and a small cup of fine green stone (Fig. 35b). A ceramic pot was placed next to the feet, not far from a V-shaped cup maybe used as a lid (Fig. 35c-d). Behind the child were stacked four beer jars typical of the 1st Dynasty and a large bowl turned upside down that might have been used during the funerals. The upper part of the fill contained two additional pottery plates (Fig. 35e-f) probably used for a similar purpose, as well as a potsherd from Level 1 that has been mixed with the sediments when the grave was dug (Fig. 16l). Lastly, the third kind of burials differ only in their lack of clay or mudbrick lining. Their size, depth, and orientation were nonetheless similar, and the bodies were buried in the same position. They were not necessarily provided with less funerary offerings, such as for instance graves 13 and 23 that both contained three beer jars.

On the whole, the burials excavated during the 2016–2019 seasons were fairly common graves, neither remarkably well-furnished, nor especially well-built. They reflected regular funerary practices performed for ordinary members of a village community in the Nile Delta during the 1st and 2nd Dynasties.⁸² Only three graves previously excavated by MoTA in the early 2000s differed from the others by an ostentatious accumulation of funerary offerings, both around the body and inside the large subsidiary room (graves 3, 5, 24, see Fig. 31: Sq. H8–I9; Fig. 9c: Sq. K9). They were probably those of members of the local elite (i.e. members of one of the dominant lineages in the community).⁸³ The extent of the Early Dynastic cemetery is still difficult to assess, yet the low concentration of graves in the north-eastern part of area 1a (compared to their high concentration in the area previously excavated by MoTA) could indicate that the cemetery did not extend much further west. In addition, no burial was found in area 3, that is to say east of MoTA excavations. Although more fieldwork is needed to confirm this view, the Early Dynastic cemetery is therefore likely to have extended between area 3 and 1. If confirmed, this would mean that the cemetery has been excavated almost completely by MoTA.

The development of a cemetery in the central part of the tell raises interesting questions regarding the shifts that occurred in the settlement pattern between the Protodynastic and Early Dynastic periods. Judging by the pottery assemblages they contained, the graves were not significantly later in date than the buildings previously erected in area 1. Although it seems reasonable to assume that no more than two centuries had passed before the area was transformed into a burial ground, the buildings were already levelled to the ground when the burials were dug, either because they collapsed, or because they were intentionally dismantled. While definitive evidence is still lacking to answer this question, it may be noted that the destruction layers covering the few preserved courses of mudbricks were limited in thickness and did not extend much beyond both sides of the walls. This does not seem to be consistent with a destruction layer caused by the collapse of an extensive architectural complex, but rather argues for the dismantlement hypothesis.

The layers covering the remains of Level 4a buildings yielded a vast amount of Early Dynastic material showing that they were contemporary with at least some of the graves dug in the eastern part of the cemetery before the latter extended westward into area 1a. It is noteworthy

⁸² Similar graves are documented in many other sites of the Nile Delta, starting by the neighbouring settlements of Tell el-Farkha and Tell el-Murra (DĘBOWSKA-LUDWIN 2012, pp. 66–70; JUCHA, BĄK-PRYC, CZARNOWICZ 2014, pp. 88–100).

⁸³ Grave 5 contained more than forty pottery jars and about thirty vessels made of calcite alabaster (personal communication S. el-Baghdati). Many fragments of bone inlays were also found in the burial chamber during the cleaning of the grave in 2018. They were very similar to those found at Abydos in contemporary contexts (PETRIE 1901, pl. 40, 58–60).

that no architectural remains but some pits and thick deposits of ashes were found in layers 10–13 (Fig. 5). This suggests that, unsurprisingly, the area directly adjoining the cemetery was left unoccupied from the late 4th millennium BCE onward, leaving an empty space between the settlement and the burial ground. In contrast with areas 1 and 3, extensive remains from the Early Dynastic period have been uncovered in area 2. Deposits relating to this period were about 1–1.5 m thick, and yielded at least three consecutive phases of superimposed mudbrick buildings containing several rooms and adjoining each other in a dense housing pattern.⁸⁴ In all likelihood, the settlement developed at that time on the western part of the tell (but also maybe in the northern and southern parts, for which no archaeological record is available yet). Two hypotheses can be advanced as possible explanations for the changes in the pattern of human occupation over the tell between Levels 4a and 4b. The first one postulates that a link did exist between the abandonment of area 1 and the development of area 2: the settlement would have shifted westward at the end of the Protodynastic period, concentrating in area 2, while the cemetery developed in area 1. The other assumes that the heart of the settlement had long been located in the western part of the tell (as suggested by the Protodynastic buildings identified in area 2, but not excavated yet): the buildings excavated in areas 1 and 3 would thus correspond to the maximum extent of the settlement that ultimately receded at the beginning of the 1st Dynasty. Both scenarios are equally plausible and a series of auger drilling tests will be conducted in the forthcoming seasons to compare the respective thickness of layers from Levels 4a and 4b along a transect between areas 2 and 1 so as to attempt to trace the changes in the settlement pattern.

The extent of the 2nd Dynasty settlement is difficult to assess, since the upper archaeological layers have been deflated in both areas 1 and 2. The scarce evidence of the last occupation phase on the tell does not go beyond a handful of pottery sherds found in very disturbed and unclear contexts. Likewise, among the graves excavated in 2016–2019 that yielded diagnostic pottery vessels, only grave 21 can be dated from this period. Although the lack of archaeological record from the northern and southern parts of the tell prevents any firm conclusions, it seems that the settlement had already entered into a phase of relative regression at the dawn of the 3rd millennium BCE and was definitely abandoned prior to the advent of the 4th Dynasty. Significantly, the neighbouring site of Tell el-Farkha was abandoned at the very same period.⁸⁵ It is not impossible that both phenomena were somehow the consequences of the reforms engaged by the rulers of the early Old Kingdom in the territorial management of rural provinces, which probably caused some settlements to decline and some other to expand.⁸⁶

⁸⁴ Fieldwork being still under way in area 2, Protodynastic and Early Dynastic levels will be dealt with in a separate study.

⁸⁵ CHŁODNICKI 2012, pp. 29–34.

⁸⁶ See for instance the settlement at Tell el-Neshed located about 10 kilometres east that developed precisely at the same period (GUYOT et al. 2018, pp. 175–179).

3. L'INDUSTRIE LITHIQUE ET LE MACRO-OUTILLAGE

Toute époque confondue, un total de 1 197 pièces lithiques, presque exclusivement en silex⁸⁷, a été mis au jour dans le secteur 1 et étudié (Tab. 2). Cet ensemble est constitué en grande majorité par des débris, soit des fragments indéterminés et fragments de galets (70 %), par les pièces liées au débitage, c'est-à-dire des nucleus, lames, lamelles, éclats bruts de débitage (17 %)⁸⁸ et par des outils proprement dits (13 %). L'état de conservation du matériel varie selon les périodes, mais il est majoritairement fragmenté, et brûlé à 40 %. Les stigmates de feu vont d'une légère altération de la couleur à une surface noircie, fissurée, parsemée de petites cupules thermiques⁸⁹. La répartition par période montre que le Néolithique récent 2 (niveau 3a) est le mieux représenté et, qu'à l'inverse, la phase la plus ancienne l'est faiblement. Ce fait tient à ce que les structures les plus anciennes furent difficiles à saisir, ayant déjà un faible impact au sol (fosses, foyers), elles ont été grandement endommagées par les occupations postérieures. La prégnance du Néolithique récent 2 reflète quant à elle les développements majeurs qui caractérisent cette période. L'ensemble des niveaux néolithiques (1-3b) a fait l'objet d'un tamisage à maille fine (5 mm), ce qui ne fut pas le cas des niveaux Protodynastique et I^{re} dynastie, ce qui explique sans doute la faible représentation de ces périodes.

3.1. Considérations générales : les matières premières, le débitage, l'outillage

Du point de vue des matières premières, deux groupes majoritaires se dégagent : 1) les galets du Nil, reconnaissables à leurs couleurs variées et leur surface corticale piquetée et rouge ; 2) la série des silex homogènes beiges opaques à grains fins, à zonations, parfois à noyaux opaques ou translucides. Un dernier groupe, les divers, rassemble des types peu nombreux de silex variés (marron foncé vitreux, jaune miel brillant, gris-beige à zonations, gris translucides, etc.). Les galets du Nil dominent largement dans les périodes néolithiques et leurs fragments constituent une grande partie des débris. Ils diminuent fortement au Protodynastique et il est probable que les quelques éclats qui y sont présents proviennent en fait du remaniement des niveaux inférieurs. Le débitage (tableau 2) est marqué par l'importance des éclats et des lamelles (80 %). Ces données doivent cependant être pondérées par la forte fragmentation du matériel. S'agissant par exemple des lamelles, deux sont entières pour la période du Néolithique ancien 3, quatre pour le Néolithique récent 1, douze pour le Néolithique récent 2 et aucune pour le Protodynastique, où elles tendent à disparaître. L'outillage conforte l'image donnée par le débitage (tableau 3). Les lamelles constituent en effet le support privilégié de l'outillage des périodes néolithiques. Au Protodynastique, ce sont les lames sous la forme de segments lustrés et de lames segmentées qui dominent. En dépit de l'importance relative⁹⁰ des

⁸⁷ Un petit grattoir (fig. 38a) de la période Néolithique ancien 3 est en quartzite fin.

⁸⁸ Il s'agit de pièces qui ne présentent aucune retouche, mais, comme beaucoup sont fragmentaires, on ne peut assurer qu'elles sont toutes brutes de débitage.

⁸⁹ À ne pas confondre avec le traitement thermique, qui est une chauffe intentionnelle, contrôlée, qui laisse sur la surface un voile brillant. Son but est d'améliorer la taille du silex. Il constitue une des caractéristiques des lamelles du Néolithique récent 2. Pour le traitement thermique des roches siliceuses, voir TIXIER, INIZAN 2000.

⁹⁰ Car on travaille sur de faibles nombres.

	Niveau 1	Niveau 2	Niveau 3	Niveau 4	Total
Nucléus	-	2	8	2	12
Débitage Lames brutes	2	4	15	7	27
Lamelles brutes	4	9	41	8	63
Éclats	13	15	49	24	101
Total débitage	19	30	113	41	203
Débris	44	160	587	51	842
Outils	7	12	87	46	152
Total pièces	70	202	787	138	1197

TAB. 2. Distribution of flint implements by level.

	Niveau 1	Niveau 2	Niveau 3	Niveau 4	Total
Lamelles retouchées	3	4	42	5	54
Lames retouchées	-	2	18	3	23
Segments lustrés	-	2	3	14	19
Lames segmentées	-	-	3	13	16
Pièces bifaciales	1	1	6	1	9
Éclats retouchés	-	1	4	4	9
Couteaux bifaciaux	-	-	2	4	6
Grattoirs sur éclat	2	-	2	-	4
Pointes de flèche	-	2	1	0	3
Grattoirs sur lame	1	-	2	1	4
Perçoirs sur lame	-	-	3	-	3
Racloirs	-	-	-	1	1
Autre	-	-	1	-	1
Total outils	7	12	87	46	152
Débitage	19	30	113	41	203
Total débitage et outils	26	42	200	87	355
Répartition (n=355)	7%	12%	56%	25%	100%
Meule	10	16	17	9	52
Molette	3	13	23	12	51
Broyon	5	8	20	10	43
Percuteur	1	2	5	3	11
Éclats	14	16	23	13	66
Débris	18	100	116	109	343
Autres	-	1	-	4	5
Total macro-outillage	51	156	204	160	571

TAB. 3. Typology and distribution by level of flint tools and stone implements.

éclats dans le spectre du débitage (environ 50 %), on note qu'ils sont rarement retouchés. Il s'agit principalement d'éclats de galets à plages corticales plus ou moins étendues qui n'étaient pas produits comme supports d'outils (même s'ils purent être utilisés à l'état brut), mais témoignent de la mise en forme des nucleus aux fins de produire des lamelles.

3.2. L'industrie de silex selon les périodes

3.2.1. *Le Néolithique ancien 3*

Vingt-six pièces seulement ont pu être attribuées à cette période, au nombre desquelles on compte sept outils (tableau 3). Il s'agit en majorité d'éclats de galets ($n = 13$), de deux lames brutes fragmentaires (dont l'une, plate et large, en silex beige crème opaque, pourrait être intrusive)⁹¹ et de quatre lamelles brutes, dont deux entières. Trois d'entre elles sont issues de galets. Elles présentent l'aspect luisant, vitreux et gras au toucher, qui signale un traitement thermique. La dernière est une lamelle régulière, entière, outrepassée, en silex beige brillant à zonations, peut-être intrusive⁹². Les trois lamelles retouchées (une entière et deux fragments) sont issues de galets. Le traitement thermique n'est pas évident. La seule lamelle entière présente, à l'extrémité distale, de fines retouches directes formant un micro-grattoir. Les deux autres exemplaires sont des fragments mésiaux à fines retouches marginales. On compte ensuite une pièce courte et épaisse, en forme de petit biface irrégulier, en silex beige crème opaque à plages jaunes brillantes, qui évoque une ébauche de croissant⁹³. Le petit grattoir sur éclat (fig. 38c) est bien calé dans la chronologie. En silex beige jaune mat, il présente une surface grasse et un émoussé des arêtes. Sa partie distale s'épanouit en un large outre-passage qui porte les retouches du front. Dans un silex gris-beige, opaque, zoné, on trouve un grattoir inverse en bout de lame courte et épaisse, à bords abattus (fig. 38b). Enfin, le grattoir bouton (fig. 38a), en quartzite rouge à grains fins, clôt cette courte série.

3.2.2. *Le Néolithique récent 1*

Il comprend 42 pièces, dont 12 outils. Deux petits nucleus sur galet, dont un chauffé (fig. 36a), ont été exploités jusqu'à épuisement et au-delà, comme l'attestent les stigmates de percussion laissés sur les arêtes du nucléus chauffé. Les neuf lamelles brutes sont toutes issues de galets. Quatre sont entières et présentent clairement les caractéristiques du traitement thermique. Les lames ne se différencient des précédentes que par leurs dimensions. Ce sont plutôt des éclats laminaires. La seule entière atteste d'une chauffe intentionnelle. Les éclats rejoignent la grande famille des galets, souvent chauffés, sauf deux pièces sur silex beige opaque qui relèvent manifestement de la taille des grands couteaux bifaciaux. On les considère intrusives : elles ressortissent du champ protodynastique⁹⁴. Des quatre lamelles retouchées, deux sont entières. L'une (fig. 38g), provient d'un galet chauffé, comme le montre sa brillance, et

⁹¹ La fosse dont elle provient a livré une quantité assez importante de matériel intrusif provenant principalement du niveau 3a.

⁹² Quelques éléments intrusifs en provenance du niveau 2 ont été retrouvés dans la fosse d'où provient cette lamelle.

⁹³ Aux périodes plus tardives, les croissants seront impliqués dans la fabrication des vases en pierre.

⁹⁴ Elles proviennent pour l'une d'un contexte dans lequel quelques intrusions ont été relevées lors du tri du mobilier céramique, et pour l'autre d'une fosse n'ayant pas livré de matériel céramique diagnostique et étant mal calée en stratigraphie.

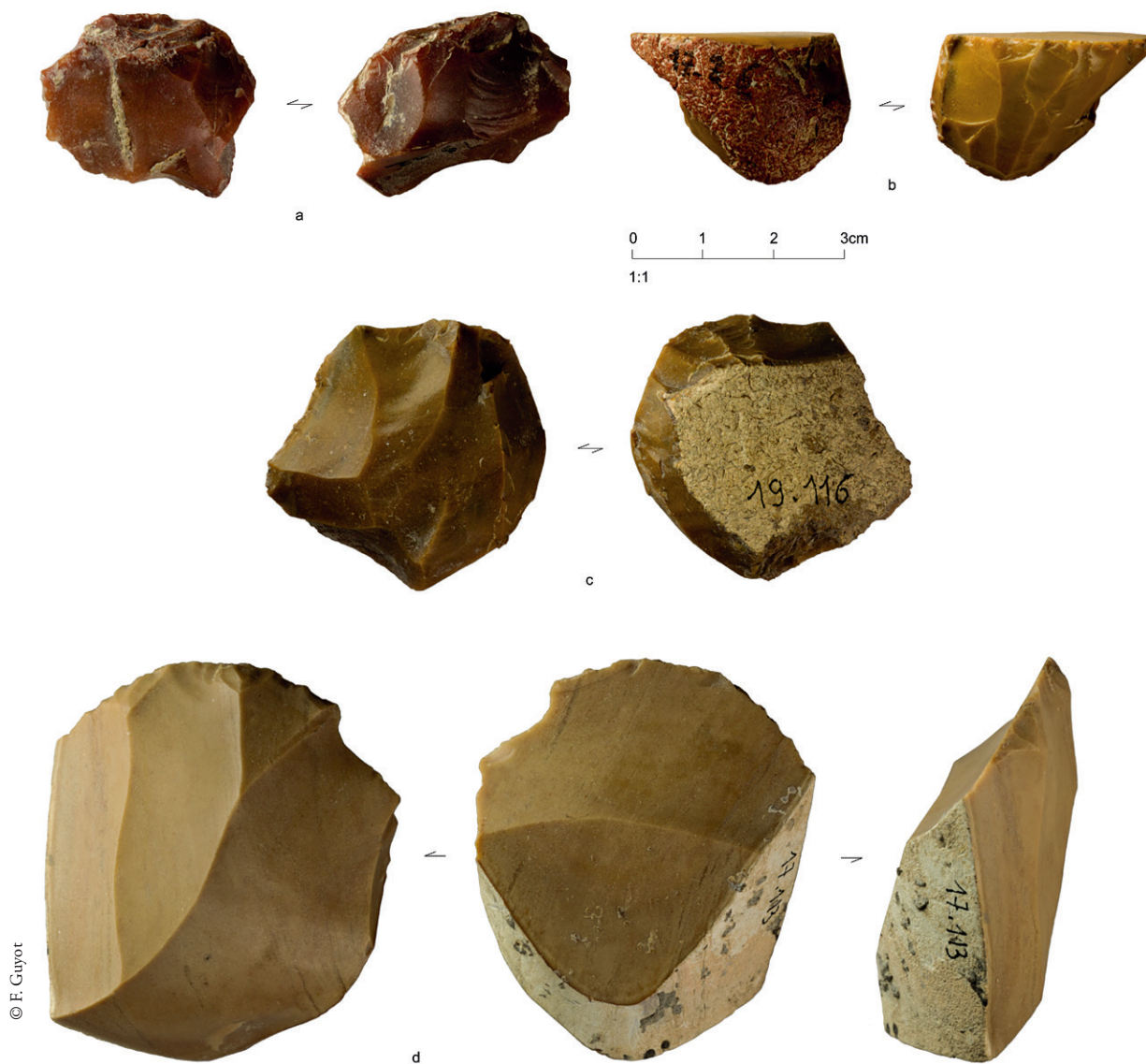


FIG. 36. Cores: exhausted heat-treated core (a), heat treated bladelet core (b), flake core (c), blade core (d).

présente à son extrémité distale de fines retouches en micro-grattoir, ainsi que deux coches basilaires. L'autre, sur galet non chauffé, présente une série régulière de retouches marginales directes sur le bord droit. Dans les deux autres cas, il s'agit de fragments proximaux sur silex vitreux, à fines retouches latérales. Les deux lames retouchées sont de nature différente. L'une est un fragment distal de lame plate, retouchée en pointe à l'extrémité, l'autre appartient à la catégorie des lames épaisses à retouches alternes⁹⁵. Deux éléments lustrés sur lame font leur apparition. L'un est brûlé, l'autre (fig. 40a) est dans un galet chauffé (silex rouge foncé brillant, à zonations blanches). Ils sont fragmentaires et présentent un denticulé lustré sur le

⁹⁵ Sur cette catégorie, voir plus bas le matériel du Néolithique récent 2.

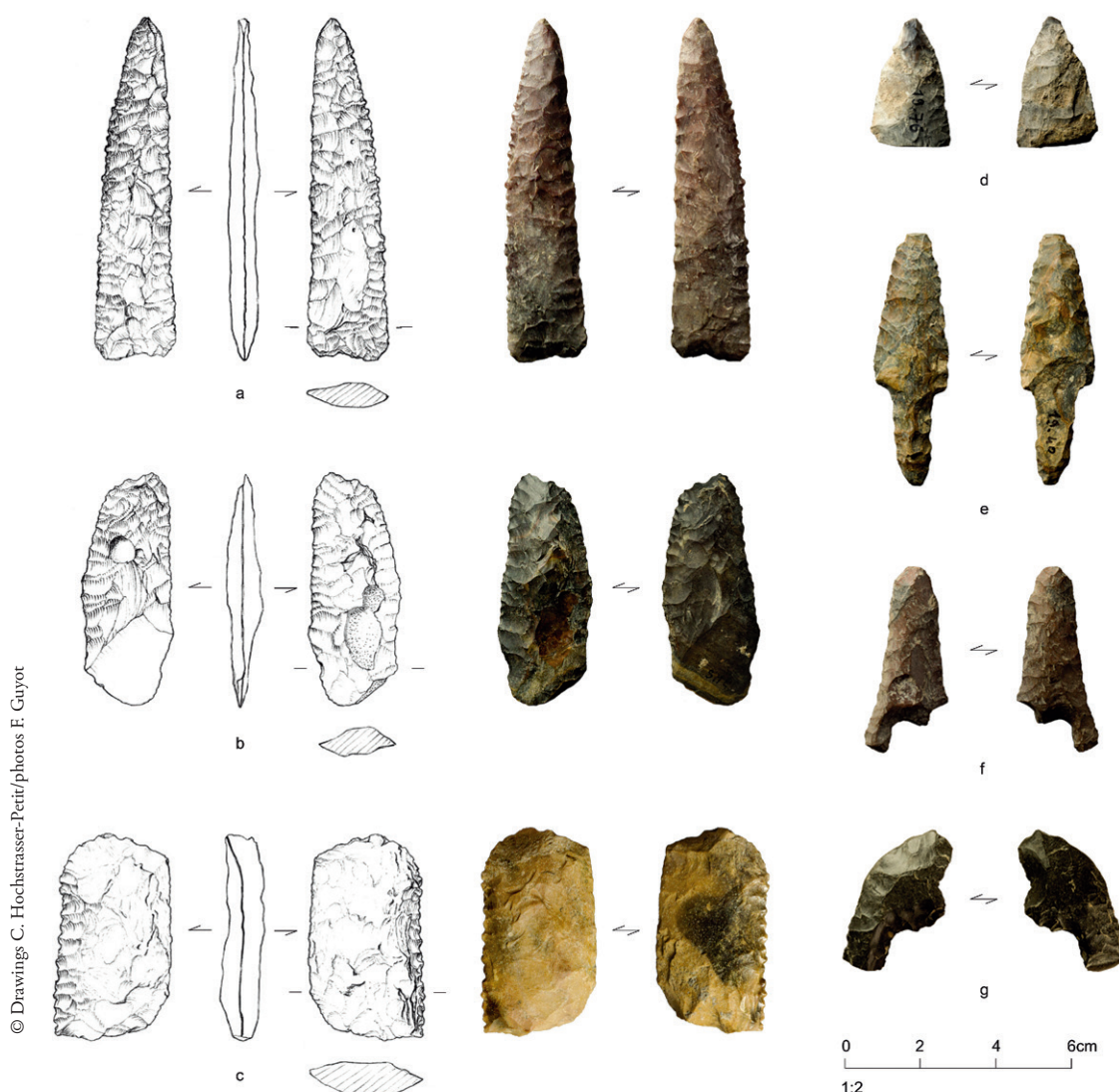


FIG. 37. Bifacials: bifacial sickle (a), bifacial pieces (b-c), fire-damaged fragment of bifacial sickle (d), tanged arrowhead (e), concave based arrowheads (f-g).

bord gauche. Deux pointes de flèches bifaciales proviennent de ces niveaux⁹⁶. L'une (fig. 37e), presque complète, est pédonculée. Elle a été réalisée à partir d'un galet, comme le montrent la texture et l'hétérogénéité des couleurs, et offre un aspect trapu qui transparaît dans la largeur du pédoncule. Celui-ci est diminué dans son épaisseur par le détachement d'une grande écaille, qui affecte également la partie inférieure du corps de la flèche. L'autre pointe est à base concave (fig. 37g). Elle a été totalement noircie par le feu, ses surfaces altérées. Il n'en subsiste qu'une moitié longitudinale avec le départ d'un aileron cassé. La partie supérieure du bord est marquée par un fort émoussé. La pointe de flèche (fig. 37f) à base concave et bords légèrement incurvés a été retrouvée hors contexte. Une autre pièce bifaciale est un probable

⁹⁶ Dans des contextes malheureusement assez perturbés.



FIG. 38. Scrapers and bladelets: small circular scraper on thick quartzite flake (a), scraper on small thick blade (b), scraper on thick flake (c), micro-end scraper on regular bladelet (d), heat-treated bladelets (e, f, h), micro-end scrapers on heat-treated bladelets (g, i, j), retouched heat treated bladelet (k).

perçoir dont la pointe est cassée. Le seul éclat retouché de la série, en silex beige opaque, relève d'une production protodynastique : il s'agit d'un grand éclat d'enlèvement de couteau bifacial, cassé en sa partie proximale⁹⁷.

3.2.3. *Le Néolithique récent 2*

C'est la période la mieux documentée. On y décompte 587 débris (essentiellement des fragments de galets) soit 73 % de la totalité des débris de toutes les périodes.

- Les lamelles

Les lamelles débitées à partir de galets chauffés constituent la production dominante de cette période. Les huit nucleus répertoriés en témoignent. Ils sont tous sur galets chauffés et ont fait l'objet d'une exploitation intensive, jusqu'à leur abandon à l'état détritique. Ils présentent néanmoins des stigmates d'enlèvements lamellaires visibles. L'exemplaire (fig. 36b), quoique unique dans la collection, illustre le standard de la production. Il s'agit d'un nucleus conique à lamelles sur galet semi-cortical chauffé, à un plan de frappe. Après la production d'une série de lamelles, le nucleus a été maladroitement repris, ce qui a engendré quelques éclats destructeurs et a eu pour effet d'endommager la corniche, rendant la pièce impropre au débitage. Le nucléus (fig. 36c) est un nucleus à éclats sur galet semi-cortical. Les éclats ont pu masquer un état antérieur de débitage de lamelles. Dans tous les autres cas, on a affaire à des fragments parfois totalement détritiques. Dans deux cas, la pièce a été fortement altérée par le feu. Des 85 lamelles de la collection (fig. 38d-k, sauf g), 26 sont entières, dont 12 brutes. Elles se répartissent ensuite en fragments distaux (9 %), mésiaux (23 %) et proximaux (17 %). Il s'agit de lamelles à profil torse pour 10 % d'entre elles⁹⁸. Dans les autres cas, le profil est rectiligne avec une légère courbure distale. Le talon est punctiforme ou plat, incliné, souvent déjeté, la corniche abrasée. La lamelle (fig. 38d) est particulièrement fine et de belle facture. Elle provient d'un silex gris-beige opaque à grains fins, à surface vitreuse, et se termine par de minuscules retouches formant micro-grattoir. Une comparaison avec le groupe très abondant des lamelles des niveaux contemporains de Tell el-Iswid atteste qu'on a affaire sur les deux sites au même type de production pour la période considérée⁹⁹. La similarité des produits ne relève pas ici d'une recherche de calibration, mais de mêmes techniques de production sur les mêmes supports. Dans la vingtaine de cas où l'extrémité distale a pu être observée, on note treize fois la présence d'une série de très fines retouches directes formant « micro-grattoir ». Ce type bien caractéristique avait déjà été relevé dans les niveaux Néolithique ancien 3 et Néolithique récent 1. Dans deux cas, la partie distale est affectée, mais sans retouches en micro-grattoir. Cependant, toutes les lamelles ne présentent pas ce même type de retouches, même si elles sont largement

⁹⁷ Le locus d'où provient ce grand éclat est marqué par une forte pollution signalée à la fouille.

⁹⁸ Beaucoup sont fragmentaires et la nature du profil ne se laisse pas facilement déterminer. Si l'on considère les 24 lamelles entières, le pourcentage s'élève à 16 %. On reste néanmoins sur des quantités statistiquement très basses.

⁹⁹ À Tell el-Samara, les dimensions des lamelles se répartissent comme suit : longueur : max. 45 mm, mini. 13 mm, moyenne 30 mm, écart-type 7 mm ; largeur : max. 15 mm, mini. 5 mm, moyenne 9 mm, écart-type 2 mm ; épaisseur : max. 5 mm, mini. 1 mm, moyenne 2,5 mm, écart-type 1 mm. Les écarts-types montrent une homogénéité de l'ensemble dont les dimensions tendent à se concentrer autour des valeurs moyennes. À Tell el-Iswid, les dimensions des lamelles (n = 403) se répartissent comme suit (MIDANT-REYNES, BRIOIS 2019) : longueur : max. 48 mm, mini. 12 mm, moyenne 35 mm, écart-type 7 mm ; largeur : max. 17 mm, mini. 5 mm, moyenne 10 mm, écart-type 2 mm ; épaisseur : max. 6 mm, mini. 1 mm, moyenne 2,5 mm, écart-type 1 mm.

majoritaires. Par exemple, sur la lamelle (fig. 38k), les retouches fines n'affectent que la partie terminale des bords et tendent à former une pointe, malheureusement cassée à son extrémité. Dans un autre cas, l'extrémité distale naturellement aiguë a été accentuée par de fines retouches. La moitié de l'ensemble des lamelles retouchées ne présente pas de retouches des bords ($n = 19$). Treize sont retouchées sur les deux bords (retouches marginales fines et continues, voire « grignotantes »). Quand un seul bord est retouché, il s'agit du droit, on ne compte qu'un seul cas où le seul bord gauche est affecté.

- Les lames

Les lames couvrent deux grandes catégories. On observe, d'une part, une série de lames qui, comme les lamelles, proviennent du débitage des galets, et correspondent aux premières phases de mise en forme des nucléus. Ce sont d'ailleurs souvent des lames techniques (outrepassées, débordantes, ravivages de flanc de nucléus). Elles occupent la totalité des produits laminaires bruts et sont pour moitié brûlées. Les lames régulières sont rares. Une seule lame de cette catégorie, brûlée, présente des retouches. Sur les dix-sept lames restantes de la série retouchée, neuf sont des lames épaisses qui constituent une catégorie bien spécifique, qui diffère radicalement de la précédente en ce qu'elle relève d'un autre mode de production et d'un matériau non-local : un silex beige crème opaque et vitreux. Il s'agit de lames robustes, d'une épaisseur moyenne de 11 mm, pour une largeur moyenne de 24 mm¹⁰⁰. Elles nous parviennent sous forme détritique, brûlées pour la plupart, et présentent plusieurs cycles de réutilisation, les fragments ayant été eux-mêmes réutilisés (fig. 39d). De manière générale, et bien qu'ils soient parfois très endommagés, ces fragments de lames épaisses entrent dans la catégorie des « couteaux d'Hemamieh » ou « *blade knives* », dont l'aspect d'origine est celui d'une grande lame torse à un pan court très incliné formant un bord rectiligne et un pan plus long, oblique, dessinant un bord convexe, les deux bords convergeant vers l'extrémité proximale. Sur les exemplaires classiques et bien conservés, le bord droit, rectiligne, est abattu par retouches directes abruptes, et le bord gauche, coupant, est laissé brut. Ce bord peut être ensuite repris par des retouches rasantes inverses qui amincissent progressivement la lame.

- Les lames segmentées

Cette catégorie de lames régulières, fréquemment à double troncature, inclut les éléments de faucille ($n = 3$), caractérisés par leur lustre et un bord ou, plus rarement, les deux bords denticulés. Les éléments non lustrés ($n = 3$) présentent des retouches ou un égrisé des bords qui en font des éléments de faucille en préparation. Il s'agit, sauf dans un cas, de fragments distaux ou proximaux, ce qui fait qu'une troncature est toujours visible. Tant par la qualité des silex qui les composent que par leur exceptionnelle régularité, ces éléments, qui connaîtront une véritable explosion au Protodynastique¹⁰¹, sont ici pour la plupart intrusifs, sauf à considérer qu'ils proviennent de l'extérieur du site et relèvent d'un mode de production qui était déjà à l'œuvre au Néolithique récent 2. Mais, si l'on retire l'exemplaire brûlé, des cinq exemplaires

¹⁰⁰ Le calcul des moyennes porte sur un nombre trop faible ($n = 9$). On se référera par comparaison à la représentation de cette catégorie dans les niveaux CBE de Tell el-Iswid, où l'on obtient les moyennes suivantes pour $n = 159$, soit un peu plus de 16 % de l'outillage : largeur : 19 mm, épaisseur : 7 mm (MIDANT-REYNES, BRIOIS 2019).

¹⁰¹ Pour les niveaux contemporains sur le site de Tell el-Iswid voir MIDANT-REYNES, BRIOIS 2014.

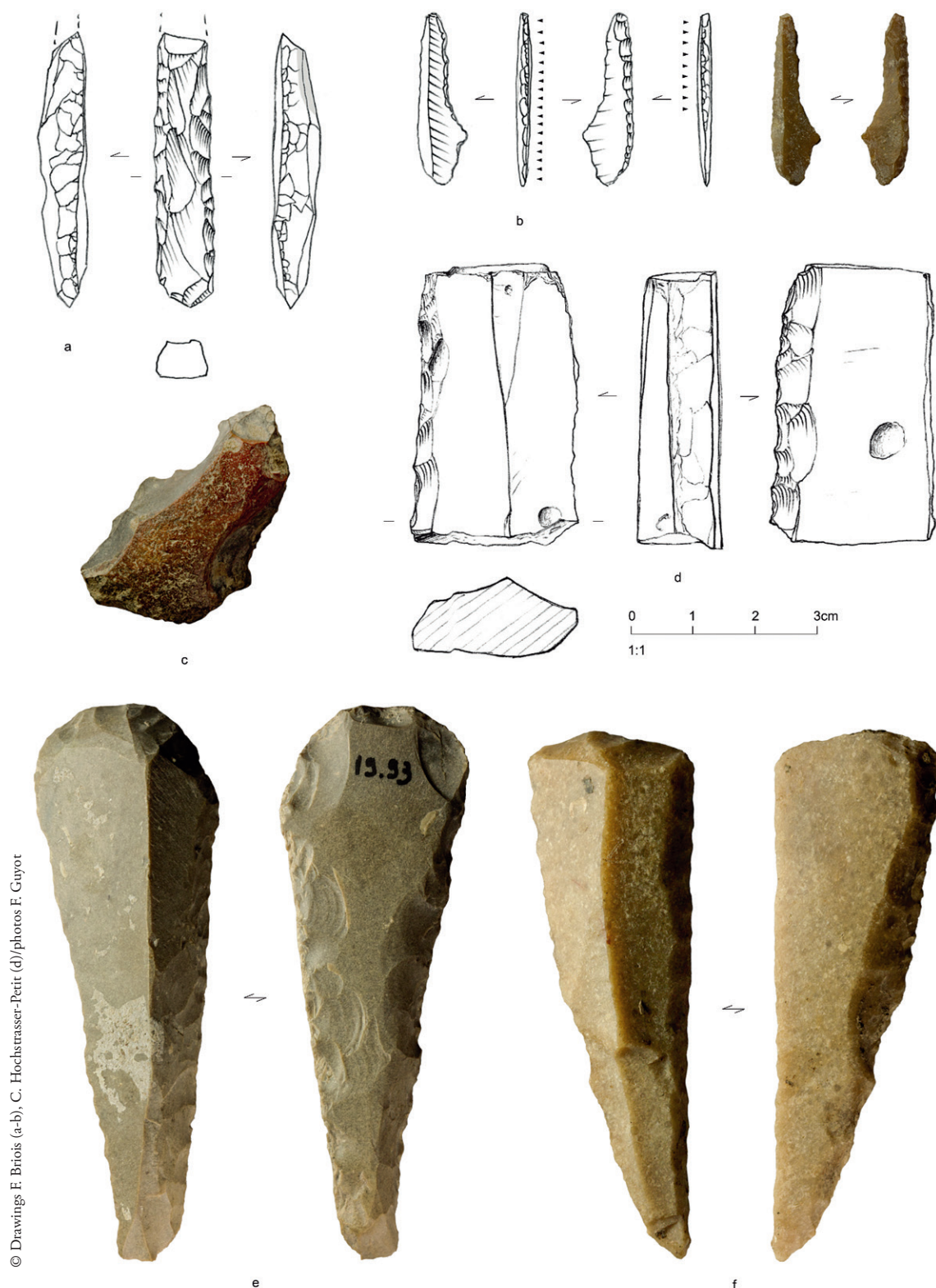


FIG. 39. Borers, retouched flakes and large blades: borer on thick double backed blade (a), borer on bladelet (b), retouched flake (c), mesial fragment of large backed blade (d), endscrapers on large blades (e-f).

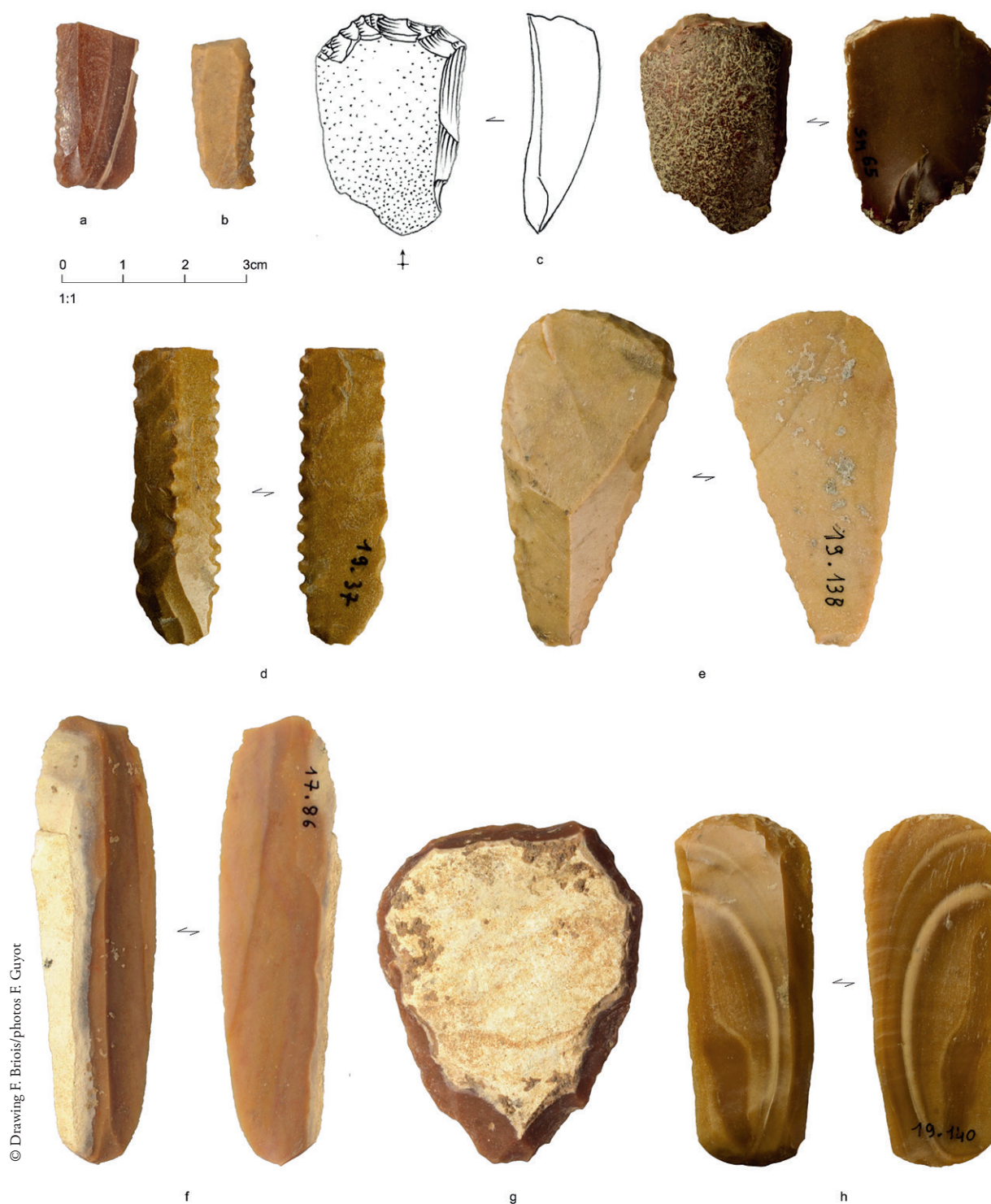


FIG. 40. Sickle blades (a,b,d), scraper on heat treated flake (c), endscraper on blade (e), blade (f), triangular scraper (g), double endscraper on blade (razor-blade type) (h).

restants, seul celui sur galet (fig. 40b), correspond au type de production que l'on rencontre sur le site pour cette période. Il provient de plus d'un contexte homogène, tandis que tous les autres sont issus de contextes remaniés.

- Les pièces bifaciales

Cette catégorie est représentée par les seuls éléments de faucille dont l'exemplaire (fig. 37a) constitue une belle illustration. Dans les autres cas, il s'agit de pièces cassées, partiellement ou totalement brûlées (fig. 37d). La faucille bifaciale (fig. 37a) est rougie par le feu et présente une zone plus sombre dans son tiers inférieur. De la base, légèrement concave, un bord convexe et un bord droit se rejoignent en une pointe et dessinent un triangle allongé. Les retouches sont couvrantes, écailleuses, les bords repris par des enlèvements effectués par pression, le bord convexe, lustré, présente un denticulé bifacial.

- Les éclats retouchés

Ils proviennent tous de galets à surface corticale résiduelle ($n = 4$). Dans les quatre cas, l'un des bords est affecté par des retouches directes continues. Sur un exemplaire, on note un fort émoussé sur le bord droit. Il convient de retenir l'éclat cortical à bord irrégulièrement denticulé (fig. 39c), qui provient d'un locus très mélangé, et relève nettement des périodes néolithiques.

- Les couteaux bifaciaux

Cette catégorie est représentée par un vestige de soie et un fragment qui témoigne des réutilisations nombreuses de ces objets, soit entiers, soit sous forme fragmentaire¹⁰². On mentionnera également un fragment quasi détritique d'une ancienne pièce bifaciale dont plusieurs coches affectent la cassure. Bien que provenant de contextes ne comportant que peu d'intrusions, ces deux pièces relèvent clairement des productions protodynastiques.

- Les grattoirs sur éclat

Au nombre de deux, ils renvoient à la production sur galets chauffés. Le grattoir (fig. 40c) a été élaboré à partir d'un bel éclat cortical de galet chauffé. Le front a été dégagé par des retouches abruptes directes, le bord droit, rectiligne, par des retouches larges, abruptes et directes. L'autre exemplaire est un grattoir sur petit éclat circulaire dont la couleur mauve, brillante, est due à l'action du feu. Une plage résiduelle corticale court sur le quart de la pièce. Le départ du front est visible sur la partie gauche, mais le reste est cassé.

- Les grattoirs sur lame

Il s'agit dans les deux cas répertoriés de grattoirs en bout de lame épaisse. Le grattoir (fig. 39e) est complet. Le silex, patiné gris (possible action de chauffe non intentionnelle), devait être originellement beige opaque. De section triangulaire, la lame présente un pan convexe abrupt, à droite, rectiligne oblique à gauche. Les deux bords se rejoignent dans la partie proximale pour former une pointe. On observe des retouches plates, étendues et écailleuses bifaciales

¹⁰² Sur les cycles nombreux de reprises et de réutilisations des grands couteaux bifaciaux, voir MIDANT-REYNES, BRIOIS 2014, p. 200.

à droite, inverses à gauche. Une petite série de fins enlèvements lamellaires obliques directs abruptes donnent une obliquité à la pointe. On a là toutes les caractéristiques d'une lame de type Hemamieh. L'aménagement en grattoir est intervenu dans un second temps, dans la partie distale, large, comme le montre la double patine du front. Une lame similaire (fig. 39f), dans un silex gris granuleux, provient du secteur 2. Elle est tronquée en partie distale. La dernière pièce de cette catégorie est fragmentaire et brûlée.

- Les perçoirs sur lame

Le perçoir (fig. 39a), malheureusement altéré par le feu, est une lame épaisse à bords abattus et section quadrangulaire. Elle évoque les mèches de forêt¹⁰³. La partie active est cassée, mais la pièce porte au niveau de cette cassure un poli qui plaide pour cette fonction. Le perçoir (fig. 39b) est un perçoir sur lamelle beige non chauffée. Il a été façonné avec soin par une succession de fines retouches abruptes affectant les deux bords. La délinéation concave du bord droit permet le dégagement d'une pointe¹⁰⁴. Le dernier exemplaire, sur silex beige vitreux, est une reprise d'un fragment de lame de type Hemamieh.

- Autre

Les pointes de flèches ne sont documentées que par un pédoncule, seul vestige. On compte également un perçoir sur fragment de couteau bifacial en silex beige opaque. Le fragment de couteau a été repris par une série de retouches latérales se développant jusqu'à l'extrémité. À partir de là, un coup de burin affectant l'autre bord a permis de déterminer une pointe. Celle-ci est très émoussée. Comme les autres fragments de couteaux bifaciaux déjà signalés, cette pièce relève de la phase postérieure d'occupation¹⁰⁵.

3.2.4. *Le Protodynastique et la I^{re} dynastie*

En nombre total de pièces et en nombre total d'outils, le niveau 4 est moins bien représenté que le Néolithique récent 2. La quantité de débris est faible, parce que la production de lamelles de galets disparaît presque complètement dans les niveaux de cette période.

- Le débitage

Sur les deux nucleus récoltés, l'un, un galet exploité jusqu'à épuisement, relève clairement des périodes antérieures. L'autre (fig. 36d), en revanche, répond à un mode de production de belles lames régulières sur un silex nodulaire beige opaque à grains fins, totalement différent des précédents. Ce dernier est un nucleus à lames partiellement cortical, à un plan de frappe très incliné et corniche abrasée, détruit par un grand éclat en écharpe qui a fait disparaître la partie inférieure. Les sept lames brutes correspondent à ce type de débitage. Deux sont entières. On compte ensuite trois fragments proximaux et deux mésiaux. Il s'agit toujours de lames régulières, à profil rectiligne, à talon plat incliné et corniche abrasée, provenant d'un beau silex marron clair à zonations, opaque, à surface parfois vitreuse. À l'instar de la belle lame entière (fig. 40f), trois portent des vestiges de cortex blanc crayeux, une autre est une lame

¹⁰³ TIXIER 1963, n° 16, fig. 16.14.

¹⁰⁴ Son affectation dans la stratigraphie n'est pas assurée : il provient d'une fosse où le matériel était fortement mélangé.

¹⁰⁵ Des inclusions du niveau 4 sont signalées dans la fosse d'où provient ce perçoir.

débordante. Des huit lamelles classées brutes, aucune n'est entière. Quatre sont brûlées, les autres sont sur galets chauffés. Qu'elles relèvent des niveaux inférieurs est hautement probable. Cependant, une seule provient d'un contexte clairement mélangé par le creusement d'une fosse, les autres se trouvent dans des *loci* d'apparence homogène. Il conviendra donc, en raison du très faible nombre de pièces impliquées, de se garder d'être trop systématique. Les éclats témoignent également de l'abandon du débitage de galets au profit de silex nodulaires de belle qualité, provenant des formations calcaires. Une même fosse a livré, avec la lame (fig. 40f), deux grands fragments d'éclat d'un beau silex beige opaque à zonations (fig. 42c), et un gros éclat d'un ancien nucleus à lames en partie cortical, détruit par des coups violents.

- Les lames segmentées lustrées ou non

Cette catégorie, que l'on a vue très faiblement présente dans les niveaux du Néolithique récent 1 et 2 (respectivement $n = 2$ et $n = 6$), constitue le type dominant pour la période suivante¹⁰⁶, où elle atteint 19 % de la totalité de l'outillage du niveau 4 et 16 % de l'ensemble de l'outillage, toute période confondue. Elle se démarque de ce qui précède en ce qu'il s'agit de lames régulières à bords parallèles¹⁰⁷, de section majoritairement trapézoïdale, avec des nervures convergentes ou sécantes, réalisées dans une gamme de très beaux silex beiges opaques à zonations, la surface variant d'un aspect mat à un brillant plus ou moins prononcé (fig. 41a-e). Les vingt-quatre exemplaires de Samara comprennent dix lames segmentées, dont quatre entières, et quatorze lames denticulées et lustrées, dont cinq entières. Les lames entières présentent toutes une double troncature et les bords sont repris par des retouches continues ou partielles, généralement directes, de semi-abruptes à rasantes. Dans le cas des lames lustrées, le bord droit est affecté six fois, le gauche cinq fois, et l'on ne note que deux exemples dont les deux bords sont lustrés (fig. 41a, d). Trois lames se rapprochent de la catégorie particulière des lames régulières épaisses que sont les *razor blades* et dont un exemplaire (fig. 40h), quoique trouvé en surface, constitue un spécimen typique. Deux exemplaires entiers (fig. 41c, e) se situent dans la gamme des beaux silex beiges opaques à zonations. Le dernier est fragmentaire et brûlé. Ces trois pièces se distinguent par leur largeur (15 à 20 mm). Les extrémités présentent une double troncature et les bords ont été repris par des retouches directes, plus ou moins courtes. Les *razor blades* constituent un type spécifique de la fin du IV^e millénaire avant notre ère qui se poursuit jusqu'à la IV^e dynastie. Les plus beaux exemplaires se trouvent dans les tombes royales de la I^{re} dynastie¹⁰⁸. Sur lames régulières, larges (20 à 25 mm) et épaisses (5 mm), ils présentent un double front de grattoir convexe ou rectiligne. Les bords sont généralement bruts. En raison de leur morphologie robuste, les trois exemplaires de Samara tirent vers la catégorie des *razor blades*, dont ils constitueraient un « second choix ». Ils ont été utilisés, comme en témoignent les retouches des bords¹⁰⁹. On accordera une attention à une pièce en particulier (fig. 40d), qui a fait l'objet d'un traitement spécifique, en lien sans doute avec l'emmanchement. Élaborée dans un galet de silex beige jaune brillant, légèrement granuleux, elle est cassée dans sa partie

¹⁰⁶ C'est le cas sur tous les sites dont on a pu suivre la stratigraphie, donc ceux du Delta. Voir MIDANT-REYNES, BRIOIS 2014, p. 197-199.

¹⁰⁷ À titre indicatif, on peut donner les dimensions moyennes, mais l'effectif est trop faible pour en tirer des conclusions générales : longueur moyenne : 60 mm ($n = 9$), largeur moyenne : 14 mm ($n = 22$), épaisseur moyenne : 3,5 mm ($n = 22$).

¹⁰⁸ MIDANT-REYNES, BRIOIS 2014, p. 202.

¹⁰⁹ Pour une étude tracéologique des pièces de Tell el-Iswid voir TORCHY 2014, p. 219-223.



FIG. 41. Sickles blades and bifacial knives: sickles on regular blades with gloss on edges (a,d), retouched blade (b), double truncated blades (c, e), fragments of bifacial knives (f, g, h).

distale. Son bord droit a été denticulé. Épaisse et de section triangulaire, sa particularité vient des tentatives qui ont été effectuées pour amincir le support. Des coups ont été portés à partir de la nervure centrale, qui était assez haute, et des enlèvements indirects, rasants, ont été effectués par pression sur la face inférieure.

- Les lames retouchées

Des trois exemplaires collectés, deux illustrent des modes d'exploitation différents. L'une des lames retouchées est un fragment mésial de lame épaisse (ép. 11 mm) en silex beige opaque, à retouches bilatérales directes, abruptes. Plusieurs enlèvements indirects rasants étendus ont affecté la pièce dans un second temps, comme le montre la double patine. Elle relève des mêmes productions que le spécimen de la fig. 39d. À l'opposé, la pièce de la fig. 41b, tirée d'un beau silex fin beige à zonations roses, est une lame régulière à terminaison pointue. Une série de fines retouches en partie distale, à gauche, accentue cette morphologie et détermine une pointe.

Le dernier exemplaire est un fragment mésial brûlé d'une lame semi-corticale présentant des retouches directes, courtes et continues sur le bord droit.

- Les couteaux bifaciaux

Il s'agit de trois fragments dans de beaux silex beiges ou roses zonés à surface plus ou moins brillante, le quatrième est sur un silex gris légèrement grenu, à abondantes petites inclusions blanches. La morphologie originelle, telle qu'elle peut être restituée à travers ces fragments, correspond aux couteaux à dos droit et à tranchant convexe. Un spécimen a fait l'objet d'une reprise des bords par retouches semi-abruptes avant cassure (fig. 41h). Les deux autres spécimens portent des coches sur les cassures, montrant que ce sont les fragments eux-mêmes qui ont fait l'objet de reprises (fig. 41f). Seule une pièce (fig. 41g), dont subsiste le tiers supérieur et l'extrémité en pointe, ne présente aucune reprise des bords, hormis quelques coches accidentelles.

- Autre

Une pièce bifaciale (fig. 37b), sur galet, a été altérée par le feu dans la partie supérieure. Les deux faces sont retouchées par des enlèvements larges, rasants, envahissants et écailleux, parfois profonds, les bords sont repris par une série de petites retouches parallèles profondes, effectuées par pression. Pas de denticulé. Des restes de cortex roux affectent une des faces et la base de la pièce. Celle-ci a été accidentellement amincie par une large écaille. Cette pièce relève à l'évidence des phases antérieures au Protodynastique¹¹⁰. Une pièce similaire a été trouvée hors contexte (fig. 37c). Des quatre éclats retouchés enregistrés, un seul se rapporte à la période en question. Il s'agit d'un éclat beige brillant lié à la mise en forme des grands couteaux bifaciaux, dont le bord gauche a été retouché en denticulé irrégulier inverse. Les trois autres pièces sont des éclats de galets chauffés, manifestement néolithiques. Le grattoir sur lame (fig. 40e) affecte la partie distale d'une courte lame retouchée en silex beige brillant. Le racloir (fig. 40g), pièce unique de la collection, est un beau racloir triangulaire dans un silex beige opaque zoné, sur un grand éclat cortical, qui présente un front de grattoir légèrement convexe, à retouches directes abruptes. La morphologie triangulaire est formée par des retouches inverses bilatérales, étendues et écailleuses.

3.3. Le macro-outillage

On dénombre 571 pièces relevant du macro-outillage (tableau 3). La matière première dominante est le quartzite qui constitue la plus grande partie des meules, des molettes¹¹¹, des éclats et débris. Puis vient le silex dont sont faits, en grande partie, les percuteurs, et qu'on trouve nombreux à l'état de débris. Le grès intéresse quelques meules et molettes, les autres matières premières sont anecdotiques, totalisant 8 % de l'ensemble.

¹¹⁰ Elle provient d'un locus pour lequel on note des intrusions Néolithique récent 2.

¹¹¹ Sur la fraction très fragmentée du matériel, il n'est pas possible de distinguer les meules des molettes. Les vestiges d'une table de travail, convexe ou concave, permettent de verser le fragment dans la catégorie des meules/molettes. Quand aucune trace ne subsiste d'une surface de travail, c'est un débris.

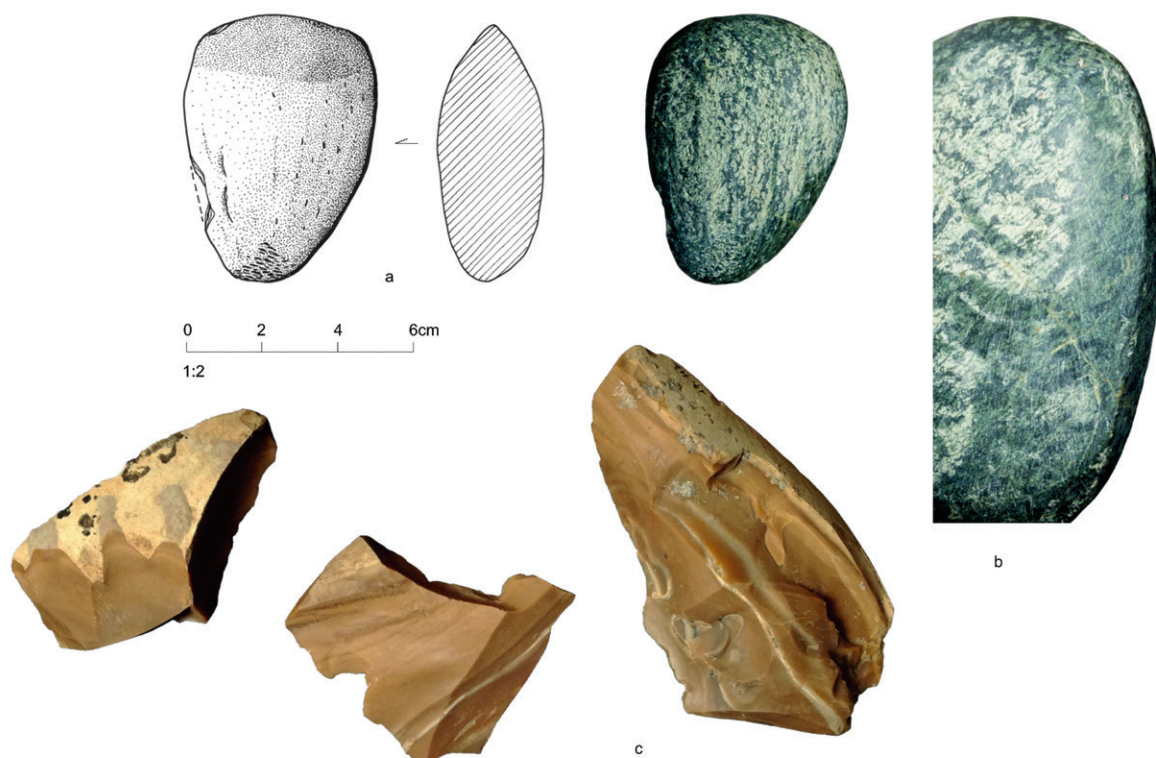


FIG. 42. Polished axe (a-b), fragments of nodular fine flint (c).

3.3.1. *Les meules*

Une meule entière et neuf fragments proviennent du niveau 1. La meule entière (fig. 43e) faisait partie du calage d'un poteau. Elle est en quartzite, de forme grossièrement parallélépipédique, à surface active légèrement concave, et de petites dimensions ($16 \times 9 \times 5$ cm). Des dix fragments Néolithique ancien 2, un fragment est en granite, tous les autres sont en quartzite. Parmi les formes les plus reconnaissables, on note un grand fragment de meule à deux faces plates et bords arrondis, de 13 cm de large pour 4 cm d'épaisseur (fig. 43b). Les fragments de meule relevant de la période suivante sont tous en quartzite. Dans deux cas, on a le profil complet de la pièce. Le premier est à section planoconvexe naviforme, la surface active étant légèrement convexe. La pièce mesure 11,6 cm de large pour une épaisseur de 6,4 cm (fig. 43a). La seconde meule présente une table de travail de concavité fortement accusée par une dépression centrale. Large de 13 cm, son épaisseur au centre (sous la dépression) est de 7 cm et de 8 cm aux extrémités. Les mêmes formes se retrouvent au Néolithique récent 2. Pour la période protodynastique, on trouve le seul exemplaire en calcaire coquiller. De forme grossièrement parallélépipédique, elle présente une table non polie, mais avec une dépression centrale.

3.3.2. *Les molettes*

Les molettes représentent la partie active du processus de broyage. Elles sont de petites dimensions, adaptées à la prise en main, et façonnées par l'usage. Sur les 51 spécimens répertoriés, quatre seulement provenant des niveaux identifiés sont complètes. Du Néolithique récent 1, on trouve une forme cylindrique plate, en quartzite. Elle présente une face abrasée et mesure $9,7 \times 9$ cm



FIG. 43. Groundstones and hammerstones (a, b), handstone slab (c), sub-spherical hammerstones (d), grinding slabs (underlying slabs) (e), groundstone (f), hammerstone (g).

pour une épaisseur de 3 cm. Du Néolithique récent 2 provient un galet de quartz avec une face d'usure plate, mesurant $6,9 \times 5,3 \times 5,1$ cm et un galet de quartzite à face d'usure plate, mesurant $5,9 \times 4,3 \times 4,1$ cm. La dernière pièce complète provient de ce même niveau. C'est un galet de quartzite de forme plus ou moins rectangulaire à une face d'usure plate inclinée, mesurant $6,2 \times 5,6 \times 3,1$ cm (fig. 43c).

3.3.3. *Les broyons*

Sphères plus ou moins régulières façonnées par l'usage qui en a été fait (percussion posée, raclage, bouchardage, etc.), les broyons n'offrent aucune différence d'une période à l'autre. Trente proviennent des niveaux identifiés (fig. 43d). Ils sont constitués à 80 % de quartzite, le reste est en silex. Leurs dimensions varient. Le plus petit mesure $3,3 \times 3,3 \times 3,7$ cm, le plus grand : $5,9 \times 5,3 \times 3$ cm, avec les moyennes suivantes : $4,3 \times 4,2 \times 3,8$ cm. Les petits modules (de 3,3 à 4,5 cm de diamètre) sont plus nombreux (n = 21).

3.3.4. *Les percuteurs*

Même si les broyons présentent parfois des traces de percussion, les galets de silex utilisés comme marteaux sont nombreux. On en trouve des débris abondants parmi les déchets. Un cas se démarque. Il s'agit d'un gros galet de très belle pierre verte dense (grauwacke?), de $8,8 \times 6,4 \times 6,3$ cm, de forme triangulaire (fig. 43g), que l'on peut attribuer au niveau protodynastique¹¹². Il a été utilisé en percussion posée, comme l'attestent les stigmates de bouchardage sur une partie de la pièce, puis en percussion lancée comme le montrent les éclats créés sur les arêtes. Le sommet du triangle évoque un percuteur tranchant.

3.3.5. *Pièces exceptionnelles*

Deux pièces exceptionnelles provenant de tombes se rapportent à la catégorie du macro-outillage. Un bloc quadrangulaire de pierre verte très dense (6,8 cm de longueur pour 5,5 cm de largeur et une épaisseur de 3,9 cm), provient d'une tombe de la I^{re} dynastie (fig. 43f). Il se trouvait derrière le crâne du sujet. Les faces sont légèrement bombées. La forme du bloc a été donnée par un polissage intense des surfaces dont les six faces portent les traces. Mais la chose étonnante est la présence, globalement au centre des deux grandes faces, d'un piquetage sommaire, qui évoque l'idée d'un godet, comme on en trouve sur les palettes. Quoi qu'il en soit, l'objet a été abandonné inachevé. La hache (fig. 42a-b) est en pierre verte dense. Elle provient des niveaux protodynastiques. Sur galet ovale, elle est biconvexe et mesure $7,2 \times 5 \times 2,9$ cm. Son tranchant, convexe, présente des traces de polissage régulières. La base est piquetée et le bord gauche, dans sa partie inférieure, présente un cran réalisé par percussion. Bien qu'on ne le retrouve pas sur le bord opposé, il est probable que la partie basale ait ainsi été aménagée pour être emmanchée.

¹¹² La fosse dont il provient est majoritairement Néolithique récent 2, mais contient du matériel intrusif protodynastique.

3.4. Conclusion et discussion

On obtient au final des résultats très inégaux selon les périodes discernées à la fouille : l'industrie du Néolithique ancien 3 représente 7 % de l'assemblage total, celle du Néolithique récent 1 correspond à 12 %, celle du Néolithique récent 2 à 56 % et celle du Protodynastique et de la I^{re} dynastie à 25 % (tableau 3). Les raisons de ces écarts tiennent en partie à l'impact au sol des populations concernées. Elles traduisent, pour la période la plus ancienne, des occupations peut-être de courte durée, qui ont laissé peu de vestiges. Ce « peu » n'a d'ailleurs pas manqué d'être perturbé par les installations postérieures. Enfin, on ne peut exclure (et ce pour toutes les périodes considérées) le hasard du tirage, c'est-à-dire la possibilité qu'il existe en un autre endroit du site des structures mieux conservées. En revanche, la présence écrasante du Néolithique ancien 2 est à mettre au compte des évolutions déterminantes qui caractérisent cette période, dans le Delta¹¹³. Il ne sera donc pas possible d'affiner le tableau au-delà des grandes tendances qui, ici, dessinent trois grands blocs : 1) le Néolithique ancien 3 et le Néolithique récent 1 ; 2) le Néolithique récent 2, qui procède des précédentes, mais voit des évolutions notoires ; 3) le Protodynastique et la I^{re} dynastie, qui marquent une coupure avec les périodes précédentes.

Il convient de saluer la grande précision des données de la fouille, chaque locus étant évalué pour sa fiabilité, ce qui permet d'avancer des hypothèses et de rejeter ce qui pourrait apparaître comme des évidences. Au regard du faible nombre de pièces, ces données sont essentielles. D'un point de vue général, les périodes néolithiques se caractérisent par une production *in situ* de lamelles comme supports de l'outillage. Débitées à partir de galets chauffés, elles présentent un talon plat, souvent déjeté, un profil rectiligne ou torse. L'outil le plus fréquent est un micrograttoir déterminé par de fines retouches directes formant un front en bout de lamelle. On rencontre également des perçoirs et des lamelles à bords retouchés. La taille sur place est attestée par l'abondance des éclats et fragments de galets, qui, prélevés dans les terrasses alluviales voisines, ont fait l'objet d'une exploitation jusqu'à épuisement. Bien qu'il ne soit pas possible de caractériser le Néolithique ancien 3 compte tenu du trop faible nombre de pièces collectées, on relève la présence de micrograttoirs sur lamelles et de grattoirs de petits modules. On se gardera de conclure sur la pièce bifaciale. Les premiers éléments lustrés et peut-être les premières lames épaisses semblent faire leur apparition. Celle des lames lustrées éveille l'intérêt, car on sait le développement majeur qu'elles connaîtront, dès le début du Protodynastique, et sans doute dès la fin de ce qui est ici nommé le Néolithique récent 2. Or, elles proviennent d'un locus pour lequel une forte pollution a été reportée : environ 15-20 % du matériel céramique était intrusif, principalement du Néolithique récent 2. On ne peut donc exclure qu'elles se rattachent plutôt à cette période. Il en va de même de la seule lame épaisse, dont la présence dans ce niveau ne prouve rien. Là encore, il est noté que le locus d'où elle provient présente quelques intrusions de la période suivante. Les grattoirs de petits modules (fig. 38a-c) sont en revanche bien calés dans la chronologie. La taille bifaciale se formule sous la forme de deux pointes de flèche sur galet, dont on ne peut dire à coup sûr qu'elles appartiennent à cette période, étant donné qu'elles proviennent de niveaux très remaniés. L'une est à pédoncule, l'autre à base concave.

¹¹³ Des occupations de cette période sont notamment attestées à Tell el-Farkha (BAK-PRYC 2018), à Tell el-Iswid (BUCHÉZ et al. in press), à Bouto (HARTUNG et al. in press), à Saïs (WILSON et al. 2014).

Néanmoins, au regard de leur quasi-absence dans la période suivante¹¹⁴, et en dépit de leur imprécision stratigraphique, on aura tendance à les laisser dans ces périodes anciennes. Il en est du même du perçoir sur lamelle retouchée (fig. 39b), dont l'aspect microlithique évoque les productions d'el-Omari¹¹⁵.

À partir du Néolithique récent 2, les lignes bougent de manière significative. La première évidence est l'explosion de la production de lamelles qui constituent 36 % du débitage et 21 % de l'outillage de cette période. La chauffe pourrait constituer un marqueur significatif. C'est sans doute à cette époque qu'émergent d'une production locale sur galets les premiers éléments de faucille sur lame. Elles procèdent du même mode de production que les lamelles et s'adaptent bien au développement des pratiques agricoles. Elles semblent alors faire concurrence aux faucilles bifaciales, dont un bel exemplaire provient de ces niveaux (fig. 37a). Cependant, eu égard à leur faible occurrence et compte du fait qu'on ne les rencontre pas sur les autres sites du Néolithique récent 2, on suggérera, en l'attente de données supplémentaires, de remonter les faucilles bifaciales aux phases antérieures¹¹⁶. L'autre point fort de cette période est une ouverture marquée vers l'extérieur, ce que montre l'apparition des lames épaisses, réalisées hors du site, sur des gîtes et ateliers de silex, par des tailleurs expérimentés. On ne peut cependant exclure qu'elles soient apparues avant, car on en a un exemplaire dans le Néolithique récent 1. C'est trop peu pour en tirer des conclusions, d'autant qu'on est, là encore, face à des pollutions significatives (11 à 20 %) intéressant le Néolithique ancien 3 et le Néolithique récent 2. En revanche, sa présence dans le niveau protodynastique, sous la forme d'une reprise, n'a rien pour étonner.

Dès la fin du Néolithique récent 2, la production de lamelles décroît¹¹⁷ de manière inversement proportionnelle à la croissance vertigineuse des éléments de faucilles sur lame, qui domineront l'outillage durant tout le Protodynastique et les premières dynasties. Il ne s'agit plus alors de lames sur galets, mais de l'exploitation massive de belles lames régulières issues de complexes miniers et réalisées par des tailleurs expérimentés. L'industrie lithique de Tell el-Samara n'échappe pas au modèle. Elle affiche pour les périodes du Protodynastique et de la I^{re} dynastie des proportions de lames segmentées (lustrées ou non) sur lames régulières de 31 %. Les plus larges et les plus épaisses d'entre elles donneront les fameux « *razor blades* » dont les plus beaux exemplaires sont en contexte funéraire. À Tell el-Samara, quelques exemplaires de lames segmentées tendent vers ce type bien particulier. Enfin, les couteaux bifaciaux, très faiblement présents dans la collection et sous forme détritique, ainsi que les grands racloirs triangulaires (un seul exemplaire) que l'on trouve jusqu'à la IV^e dynastie¹¹⁸, trouvent leur place logiquement dans cette dernière période.

¹¹⁴ Aucune ne figure dans le matériel lithique Néolithique récent 2 des sites de Tell el-Iswid, Tell el-Farkha, Bouto et Saïs. Les pointes de flèche bifaciales se trouvent, en revanche, à el-Omari (DEBONO, MORTENSEN 1990, pl. 17.1-6), Mérimé II (EIWANGER 1988, pl. 33) et dans les sites du Fayoum (SHIRAI 2010, p. 321-330).

¹¹⁵ DEBONO, MORTENSEN 1990, pl. 23, n° 22.

¹¹⁶ Le locus d'où provient la faucille bifaciale (fig. 37a), présente des intrusions Néolithique ancien 3 et Néolithique récent 1.

¹¹⁷ Le phénomène est le même à Bouto (KINDERMAN, RIEMER in press) et à Tell el-Iswid (étude en cours par B. Midant-Reynes et F. Briois).

¹¹⁸ KROMER 1978; CONARD 2000, fig. 10.

4. FAUNAL REMAINS

The present study deals with the faunal evidence from area 1. Faunal remains were both hand-picked during the fieldwork and dry sieved using 2 mm meshes. The animal bone identification was conducted in two seasons (2017 and 2019), with the aid of bone atlases. Faunal remains from area 1 were abundant with more than 5 400 fragments (tableau 4). Preservation was poor due to various post-depositional processes that have caused severe damage: the acidity of the sediment and the presence of salty concretions had caused heavy corrosion of the bone surface, and acute fragmentation resulting in a high percentage of splinters. These post-depositional processes have limited bone identification: only 36% of the remains have been identified. They also prevented any anthropic traces—such as cut and burning mark—from being preserved.

4.1. Faunal assemblages and chronological phases

The four chrono-cultural phases identified in area 1 were represented, although most of the faunal remains came from the Early Neolithic 3 and Late Neolithic 2 levels. Faunal spectrum showed a large proportion of fish representing almost 48 % of identified specimens. Catfishes dominate with the presence of *Synodontis* sp., *Bagrus* sp. and Clariidae. A few remains of Nile perch (*Lates niloticus*) and tilapias (*Tilapia*) have been identified as well. Aside from fish, domesticates represented an important part of the assemblages with pigs (*Sus domesticus*) particularly well represented, followed in terms of percentage by cattle (*Bos taurus*) and caprines. For the latter, both goat (*Capra hircus*) and sheep (*Ovis aries*) were present although the assemblages' poor preservation limited the specific identification of most of the caprine remains. Other domestic animals included dog (*Canis familiaris*) and probably donkey (*Equus* cf. *asinus*). Other mammals included a few remains of rodents (possibly intrusive) and hippopotamus (*Hippopotamus amphibius*). The latter was the most important hunted species during the Neolithic and Proto-Early Dynastic periods in Lower Egypt, where it could find its essential habitat requirements: water and grassland.¹¹⁹ Seven bones and teeth fragments have been found in the settlement (fig. 44a). This argues for a hunt to protect cultivated fields as has been suggested for the settlement of el-Omari.¹²⁰ Among the rest of the vertebrates, a few bones of birds (too fragmentary to be identified) and some remains of Nile softshell turtle (*Trionyx triunguis*) have been recorded. The invertebrates represented more than 10% of the identified remains. However, in spite of the large diversity of shells documented in the Nile Delta, the latter included mainly large Nilotic bivalves such as *Spathopsis rubens*, *Unio abyssinicus* and *Etheria elliptica*, the freshwater oyster (Tab. 4). Some fragments of marine shells (Muricidae) deserve to be mentioned. When looking at the distribution of the main taxa identified in each of the four occupation levels, some differences emerge (fig. 46a). Fish were largely dominant during the Early Neolithic 3 (more than 70%), while they represented about 30% in the later levels. Pigs were the dominant taxa from the Late Neolithic 2 onward. Caprines were seldom in every level.

¹¹⁹ LINSELEE, VAN NEER 2009.

¹²⁰ BOESSNECK, VON DEN DRIESCH 1990.

	Level 1	Level 2	Level 3	Level 4	Total	
Vertebrate	Donkey (<i>Equus</i> cf. <i>asinus</i>)	-	-	3	3	
	Hippopotamus (<i>Hippopotamus amphibius</i>)	1	-	6	7	
	Cattle (<i>Bos taurus</i>)	43	27	87	25	182
	Large ungulate	24	3	29	17	73
	Sheep (<i>Ovis aries</i>) / goat (<i>Capra hircus</i>)	7	1	1	2	11
	Pig (<i>Sus domesticus</i>)	68	26	185	113	392
	Middle-sized mammal	89	45	174	75	383
	Dog (<i>Canis familiaris</i>)	-	-	7	-	7
	Unidentified rodent	4	-	9	-	13
	Unidentified bird	3	2	2	-	7
	Ostrich (<i>Struthio camelus</i>): eggshell	1	-	-	-	1
	Softshell turtle(<i>Trionyx triunguis</i>)	-	1	1	-	2
	Tilapia (Tilapinii)	4	1	-	-	5
	Nile perch (<i>Lates niloticus</i>)	6	-	-	4	10
	Clariid catfish (Clariidae)	14	10	116	47	187
	Catfish 4 (<i>Synodontis</i> sp.)	2	-	9	-	11
	Catfish 3 (<i>Bagrus</i> sp.)	-	-	6	2	8
	Unidentified catfish	338	16	52	16	422
	Unidentified fish	19	9	31	6	65
	Total identified vertebrate	623	141	709	316	1789
Invertebrates	Muricidae	2	-	4	-	6
	Unidentified gastropod	4	9	-	-	13
	Unidentified bivalve	26	17	85	24	152
	<i>Unio</i> sp.	-	-	9	-	9
	<i>Spathopsis</i> sp.	2	3	9	-	14
	<i>Etheria elliptica</i>	-	-	1	-	1
	Total identified invertebrate	34	29	108	24	195
<i>Unidentified</i>	1026	400	1664	351	3441	
Total faunal remains	1683	570	2481	691	5425	

Tab. 4. Fauna remains from area I: numbers of identified specimens (NISP) by level.

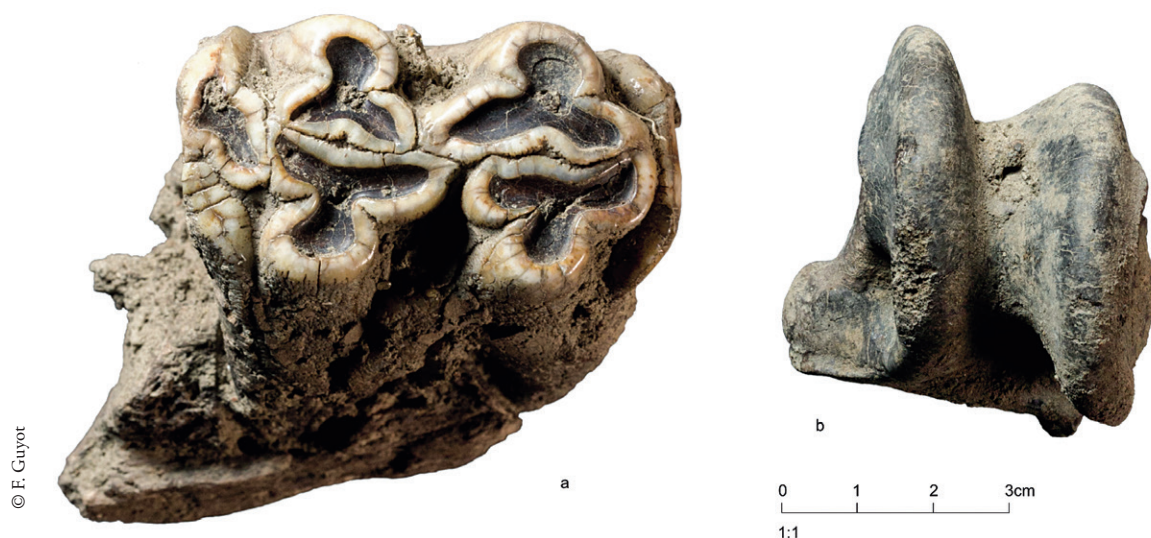


FIG. 44. Hippopotamus molar (a) and talus (b) from a possible donkey.

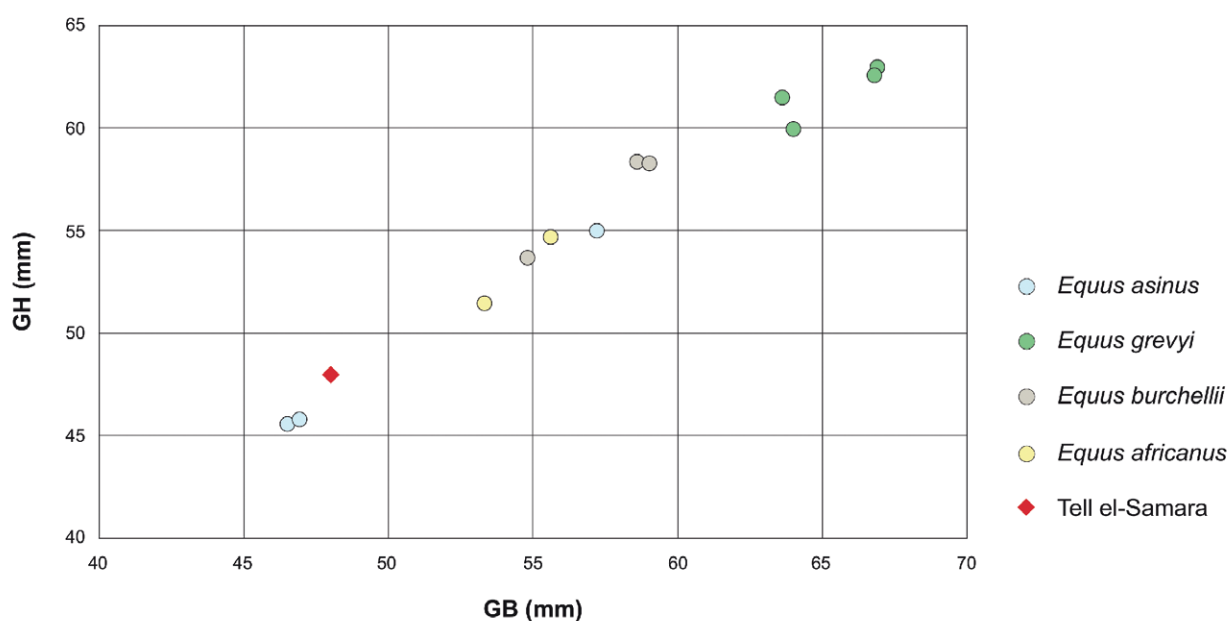


FIG. 45. Comparison of breadth and height measurements (GB and GH, after von den Driesch 1976) between a possible donkey talus from Tell el-Samara and modern specimens of zebras, wild ass and donkey (after Rossel et al. 2008; Eisenman 2007; Lesur unpublished data).

4.2. Fishing at Tell el-Samara

Fish remains were predominant in the faunal spectrum and were obviously a major component of the diet at Tell el-Samara, especially during Early Neolithic 3. Catfish were by far the most common species fished as evidenced by three different taxa composing almost 90% of the fish remains (tableau 4). The various species suggest fishing in different kinds

of aquatic habitats. Some species such as bagrid catfish, *Synodontis* catfish and Nile perch were species from well-oxygenated water, whereas most other species, especially clariid catfish and tilapia, were typically from shallow waters (they reached the flood plain during the inundation to reproduce).¹²¹ Thus, the spawning season was the best period to capture them as they came very close to the shore and could be easily caught by hand, with sticks or wounding implements. Even though fish bones were numerous in the record from area 1, their poor preservation limited their measurements and therefore the reconstruction of their size. Regarding clariid catfish, only 14 specimens coming from Levels 3–4 could have been measured. They evidenced the presence of large, sexually mature specimens (more than 110 cm long) but also small and younger ones (around 20 cm long). While it may be suggested that they were captured during the spawning season in the shallow waters, data remain too limited for a more detailed estimation of the main fishing season. As for the other catfish or the Nile perch that lived exclusively in well-oxygenated water, their exploitation may have mainly occurred during the low-water levels in spring, when the main channel was more easily accessible. The main season for fishing was probably during the flood when clariid catfish were easier to catch, although the proximity of water in the Nile Delta facilitated all-year fishing practices especially if local groups used different fishing techniques.

4.3. Herding at Tell el-Samara

In addition to fishing, herding was another important source of animal products. Pig was highly dominant and represented between 13–47% of identified remains depending on the level (fig. 46a). The distribution of skeleton parts shows a lot of long-bone fragments, probably resulting from meat consumption, but also many skull and teeth parts. This could result from preservation issues since the acid, salty sediments may have damaged the porous bones such as those from the rachis. Young adults (6 to 24 months) seem to dominate the assemblage, showing a typical consumption pattern. Data were too limited to further explore the exploitation patterns of cattle, sheep and goats. However, for all the three species, the presence of all skeleton parts coming mainly from young adults suggests meat production strategies, probably also with the consumption of milk. The presence of a few remains of donkey in Level 4 (tableau 4) is noteworthy as it provides new data on the question of the domestication of the donkey in Africa and its use during the late 4th millennium BCE. This issue is quite difficult to assess because, like most of the species that were used for transportation or work, donkeys were rarely eaten and were thereby significantly under-represented in the faunal assemblages.¹²² Recent genetic studies have started to shed light on the origin of its domestication. Sub-specific forms of its ancestor, *Equus africanus*, were found across arid zones of Africa and the Arabian Peninsula, both regions being possible domestication centres. Analyses of mtDNA sequences from both wild

¹²¹ VAN NEEER 2004.

¹²² ROSSEL et al. 2008.

and domestic species have identified two maternal lineages within the domestic donkey.¹²³ The “Nubian lineage” was undoubtedly domesticated in Africa, as indicated by its close connection with the Nubian African wild ass sequences (*E. africanus africanus*). The origin of the second lineage, which is closer to the Somali wild ass (*E. africanus somaliensis*), is less clear as this wild ass was also present in the Arabian Peninsula.¹²⁴ Some Egyptian sites dated from the 5th and 4th millennium BCE have yielded the earliest remains of potential domestic donkeys with some bones smaller than in the wild ass.¹²⁵ However, widespread morphological change was slow to develop, and remains of donkeys with a morphology not yet distinguishable from the African wild ass have been documented in several late 4th millennium BCE settlements. This is, for instance, the case in the settlement of Tell el-Iswid,¹²⁶ and in the early dynastic site of Abydos, although in the latter evidence of bone pathologies suggests the use of donkeys to carry heavy loads.¹²⁷ When comparing the measurements of a talus found in Level 4a with data from modern equids, it appears that the specimen was fairly small and fits in the same range as domestic donkey (fig. 45). This argues for its domestic status. Its presence in the humid landscape of the Nile Delta, very different from its natural arid habitat, tends to confirm this assumption.

4.4. Animal exploitation in Lower Egypt in the 5th and 4th millennium BCE

In terms of food production, the 5th millennium BCE was a critical period in Lower Egypt. After the first introduction of livestock, cattle and caprines adapted to a mobile herding system at the beginning of the 6th millennium BCE, the following millennium saw the development of sedentary farming with the arrival of pigs and cereals from the Levant.¹²⁸ Recent genetic studies on human populations and their movements into Africa from the Near East seem to corroborate this bimodal pattern: a first wave seems to have taken place during the eighth or 7th millennium BCE and could correspond to the arrival of cattle herders who already had the lactase persistence haplotype.¹²⁹ The second wave, strongly associated with the adoption of agriculture in Egypt, occurred during the 6th millennium BCE and could be linked to movements initiated by droughts.¹³⁰ Unfortunately, only a few sites yielded large faunal assemblages for assessing these changes. In addition, the poor preservation of remains due to sediment acidity and the presence of salty concretions have limited the archaeozoological analyses. For the Early Neolithic 3 (second half of the 5th millennium BCE), six main sites provided faunal remains (fig. 46b). Most of the sites show a clear predominance of fish remains, except at Merimde where livestock represented almost half of the assemblage. At el-Omari wild mammals and birds were widely exploited. As for livestock exploitation, both

¹²³ BEJA-PEREIRA et al. 2004; VILÀ et al. 2006; KIMURA et al. 2010.

¹²⁴ GIFFORD-GONZALEZ, HANOTTE 2011.

¹²⁵ BOESSNECK, VON DEN DRIESCH 1990; BOESSNECK, VON DEN DRIESCH, ZIEGLER 1989; ROSSEL et al. 2008.

¹²⁶ LESUR 2018.

¹²⁷ ROSSEL et al. 2008; MARSHALL, WEISSBROD 2011.

¹²⁸ LESUR 2013; LESUR 2019; LINSEELE 2014.

¹²⁹ SMITH 2013.

¹³⁰ HASSAN 2000; SMITH 2013.

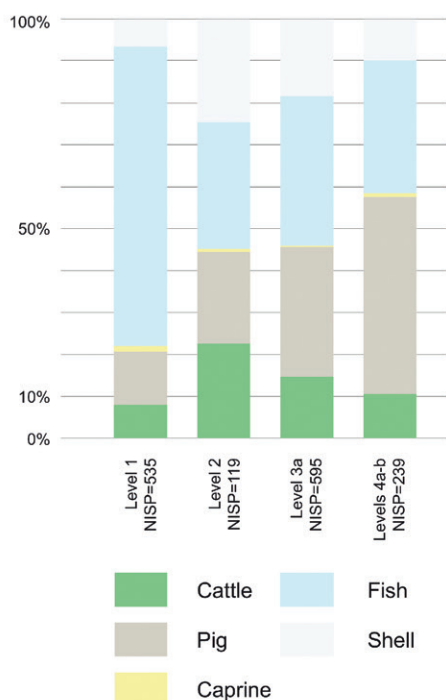
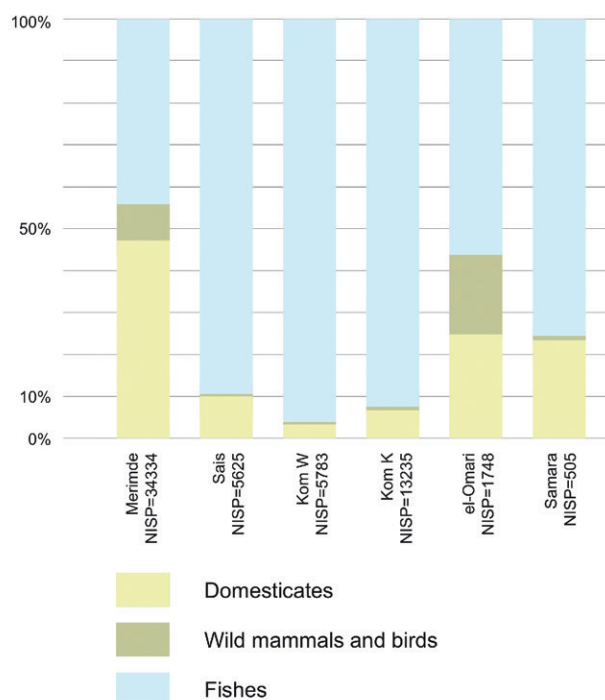
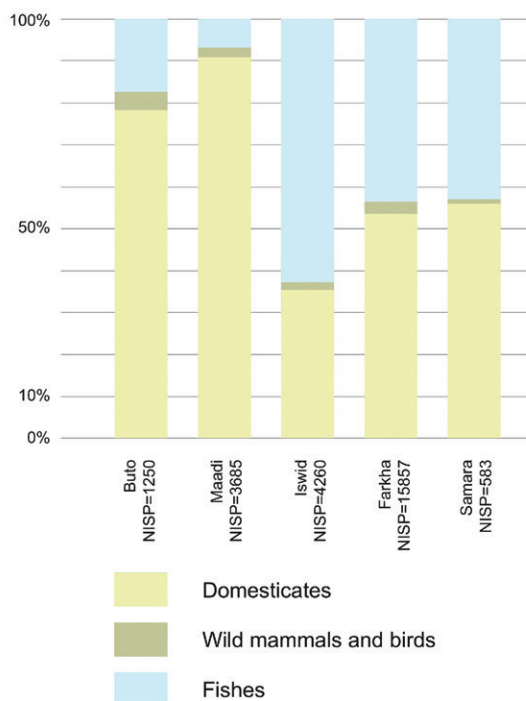
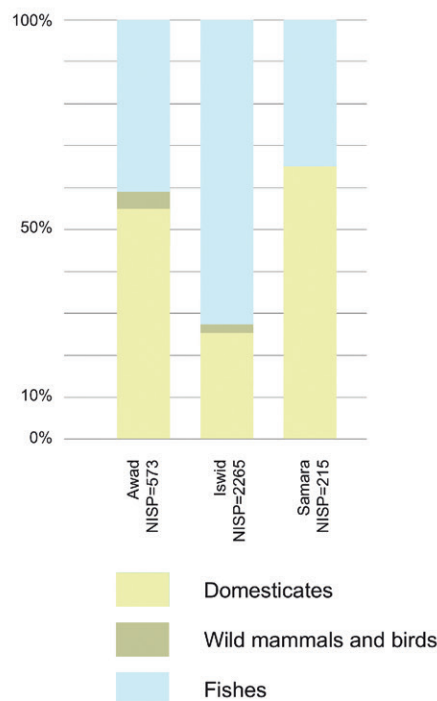
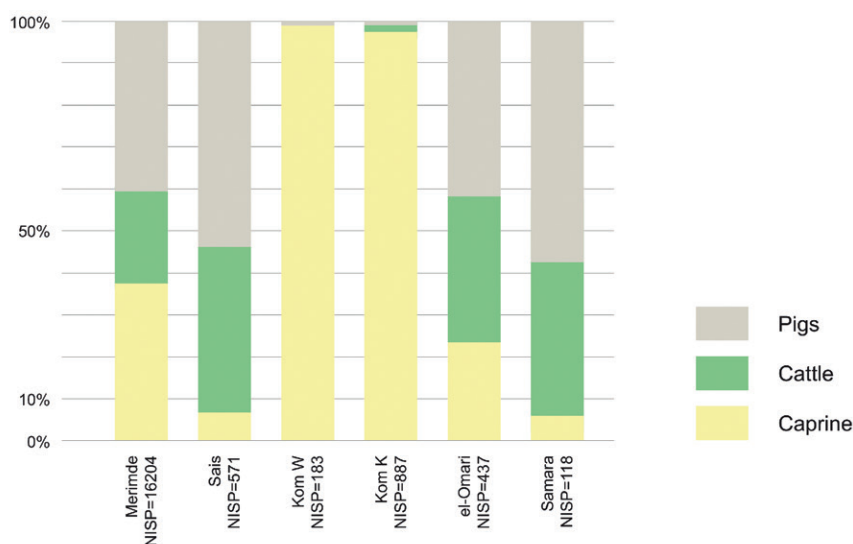
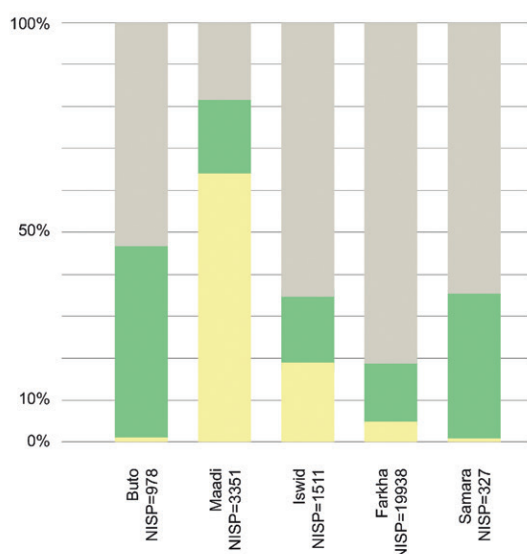
a- Tell el-Samara levels 1-4b**b- Early Neolithic 3 period****c- Late Neolithic 1-2 periods****d- Protodynastic and Early Dynastic period**

FIG. 46. Distribution of faunal remains from Tell el-Samara according to NISP % (a) and diet composition in contemporary settlements by periods (b-d). After Merimde (von den Driesch, Boessneck 1985), Saïs (Bertini, Ikram 2014; Linseele 2014), Kom W and Kom K (Linseele et al. 2014), el-Omari (Boessneck, von den Driesch 1990), Tell el-Samara (this study), Buto (von den Driesch 1997), Maadi (Boessneck, von den Driesch, Ziegler 1989), Tell el-Iswid (Lesur 2018), Tell el-Farkha (Ablamowicz 2002; Ablamowicz 2004; Ablamowicz 2006); Tell Ibrahim Awad (Boessneck, von den Driesch 1992).

a- Early Neolithic 3 period



b- Late Neolithic 1-2 periods



c- Protodynastic and Early Dynastic period

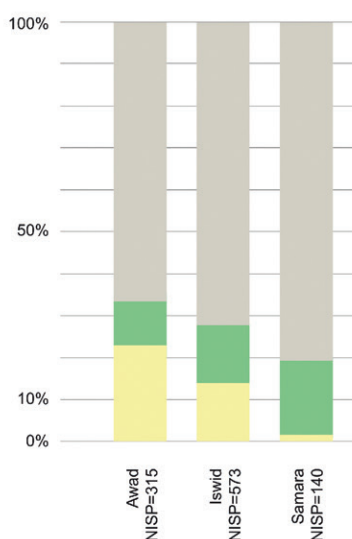


FIG. 47. Ratio of cattle, pig and caprines in the faunal assemblages from Tell el-Samara and contemporary settlements according to periods (see references Fig. 46).

Tell el-Samara and Sais put a great emphasis on pigs with very few caprines (fig. 47a). Merimde and el-Omari presented balanced strategies between pig, cattle and caprine herding. Kom K and W in the Fayum were much focused on caprines. These discrepancies could be explained by environmental conditions, since in the Nile Delta (Sais and Tell el-Samara) the conditions provided a consistent water supply that favoured pig herding, whereas in the Fayum caprines were better suited to an arid environment. During the first half of the 4th millennium BCE, which saw the development of a northern regional culture, animal exploitation showed clear evolution (fig. 46c). In most of the settlements, domesticates became predominant except at

Tell el-Iswid where fish still represented more than half of the faunal assemblage. Regarding herding strategies (fig. 47b), the settlements located in the Nile Delta showed a marked preference for pig exploitation, whereas at Maadi (closer to the desert margins), caprines with their better adaptation to aridity seem to have been favoured. At the end of the 4th millennium BCE, Tell el-Samara, Tell Ibrahim Awad, and Tell el-Iswid, all located in the eastern part of the Nile Delta, still showed a large exploitation of fish, especially at Tell el-Iswid (fig. 46d). Regarding the livestock, they showed a very clear predominance of pigs (fig. 47c) thanks to favourable environmental conditions in that region.

4.5. Conclusion

The 5th and 4th millennia BCE saw drastic changes in food production strategies and more generally in the relationships between populations and the rich environment of the Nile Delta. The spread of domesticates into Lower Egypt from the Levant (pig, caprines, possibly cattle, cereals and pulses) had far reaching consequences on food consumption patterns, and strongly impacted the landscapes through the management of water resources and the development of large areas of cultivated fields and pastures. People nonetheless continued to exploit wild resources. While most of the large wild mammals progressively disappeared because of human activities, aquatic resources (especially fish and shells) remained a large component of the diet of northern communities. The likely evolution of fishing techniques with the use of harpoons, hooks, nets and boats allowed the different kinds of aquatic environments to be exploited throughout the year. Like other contemporary sites, Tell el-Samara offers data of primary interest for tracing these processes with an animal food economy based mainly on pig herding and catfish fishing and divided between food production strategies and local resources management.

5. SUMMARY AND OUTLOOK

Frédéric Guyot

While excavations at Tell el-Samara are still at an early stage, significant, most encouraging results have already been achieved over three seasons of fieldwork. One of the most significant outcomes from the renewed archaeological research on the tell was probably the excavation of a late 5th millennium BCE settlement. Although poorly preserved and so far explored over a limited area, the basal occupation level in the central part of the tell provided relevant data on the formative period of the regional prehistoric culture of Lower Egypt. The material, faunal, and botanical evidence from the first village are key milestones for reconstructing the spread of food-producing economy into the Nile Delta and the subsequent development of early herding and farming communities. These data are even more important as, apart for Merimde, Tell el-Samara is the only 5th millennium BCE settlement currently under excavation. Future fieldwork will aim to explore the earliest occupation of the tell by extending the excavated area to the north, where the limited thickness of later deposits allows the *gezira* to be reached about

50 cm below the top soil. The early 4th millennium BCE settlement is also of special interest. Regrettably, remains from the late Neolithic I settlement uncovered in area 1 were extensively deflated and—judging by the slopes of the layers observed in section—it seems unlikely that better preserved remains could be found in the northward extension of the area. However, further exploration of Level 2 would be highly beneficial, for these layers are likely to provide new insights on the onset of Lower Egyptian culture at the dawn of the 4th millennium BCE. An additional westward extension of the excavated area, starting from the south-western corner of area 1a, where the remains from that period appear to be less damaged, might be considered for that purpose. The later settlements relating to the late Neolithic (c. 3600–3300 BCE) and Protodynastic (c. 3300–3100 BCE) periods yielded far more extensive remains. Although the exploration of these levels will continue providing additional information on the mid-late 4th millennium BCE communities of the eastern Nile Delta, their clearing raises questions as to which fieldwork strategy to adopt. Settlements from both periods are already well-documented in the Nile Delta and contemporary occupations are currently excavated over large areas in several locations, starting with the neighbouring sites of Tell el-Farkha and Tell el-Iswid. Delivering original outcomes would therefore require considerably extending the excavated areas in both areas 1 and 2, and opening a new sector in between, so as to study the settlement pattern and the spatial distribution of economic activities, as well as their changes over time. This would imply a drastic increase in labour (and thereby costs) for uncertain results. The same is true regarding the Early Dynastic cemetery in the eastern part of the tell. The few graves recently excavated were those of regular members of a village community and did not provide much more information than the hundreds of burials already documented for that period. Accordingly, the forthcoming seasons of fieldwork at Tell el-Samara will focus on the exploration of remains from the late 5th and early 4th millennium BCE for a better assessment of the onset of agriculture and sedentary life, not only in the Nile Delta, but throughout Egypt.

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