Evidence for local roots of the owners of the First Dynasty elite tombs at Abu Rawash

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ABSTRACT

The status tombs at cemetery M at Abu Rawash share design and layout of the superstructures with elite tombs at other locations, the owners of these tombs are associated with the higher echelons of the state administration in the First Dynasty. The distinct design of their substructures share features with tombs of the middle classes in the cemeteries at the site.

A re-evaluation of the tomb types shows evidence for three distinct types of substructures of tombs, present in all cemeteries at the site. The distinct differences in design and construction of the substructures are interpreted as belonging to kin groups with each distinct mortuary practices. The mortuary practices were shared by multiple social layers in the local community, including the elite who were buried at cemetery M. A careful analysis of the mortuary landscape of the site, suggests the existence of systems of patronage, most likely based on family or kin group lines. It can be argued that patronage may have been a key factor in the social and economic dynamics of the construction of the status tombs at cemetery M. The resulting social interactions provide a new perspective to assess ownership of the tomb as non-royal.

KEYWORDS

Stratified community – shared mortuary practices – kinship groups – systems of patronage – elite tombs – middle class tombs

أدلة على الجذور المحلية لأصحاب مقابر النخبة من الأسرة الأولى بأبو رواش

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الملخص

تشترك المقابر بالجبانة M فى أبو رواش فى التصميم وتخطيط بنائها العلوى مع مقابر النخبة من مواقع أخرى من مصر القديمة، ويرتبط أصحاب تلك المقابر بأشخاص من المستويات العليا لإدارة الدولة خلال عصر الأسرة الأولى. كما يشترك التصميم المتميز للبناء السفلى الخاص بمقابرهم بمميزات موجودة بمقابر أفراد ينتمون للطبقة الاجتماعية الوسطى بجبانات موجودة بالموقع.

تُظهر إعادة تقييم طرز تلك المقابر إلى وجود دليلاً على ثلاثة طرز متميزة من الأبنية السفلية للمقابر الموجودة فى جميع الجبانات بالموقع. ويتم تفسير الاختلافات المميزة فى تصميم وبناء الأجزاء السفلية من المقابر على أنها تنتمى إلى مجموعات لأقارب، لكل منهم ممارسات جنائزية متميزة. حيث تم تقاسم الممارسات الجنائزية من قبل طبقات اجتماعية متعددة فى المجتمع المحلى، بما فى ذلك طبقة النخبة الذين دفنوا فى الجبانة M. يشير التحليل الدقيق للممارسات الجنائزية بالموقع إلى وجود أنظمة رعاية، على الأرجح تعتمد على أفراد من الأسرة أو صلات قرابة. ويمكننا القول بأن الرعاية ربما كانت عاملًا رئيسيًا فى الديناميكيات الاجتماعية والاقتصادية لتشييد المقابر بتلك الدراسة بالجبانة. توفر التفاعلات الاجتماعية الناتجة منظورًا جديدًا لتقييم ملكية المقبرة على أنها غير ملكية.

الكلمات الدالة

المجتمع الطبقى – الممارسات الجنائزية المشتركة – مجموعات القرابة – أنظمة الرعاية – مقابر النخبة – مقابر الطبقة المتوسطة

The large mastaba tomb complexes of the First Dynasty at sites like Tarkhan, Giza, Saqqara North, Abu Ghurab and Abu Rawash are often seen as built by and for the members of the royal court (Emery 1961; Cervello-Autuori 2002; Morris 2007a), or even as royal cenotaphs (Emery 1961; Cervello-Autuori 2017). Other scholars have argued that the owners of these large mastaba tombs were high officials of the state and members of the royal court. Recently Josep Cervello-Autuori (2017) argued extensively in favour of royal ownership of the large tombs at cemetery M at Abu Rawash; the analysis was primarily based on the elite tombs only (see below).

A recent re-assessment of the morphology of the tombs of the middle and lower classes in the Lower Cemeteries at Abu Rawash leads to some new and interesting observations. The variety in the design of the substructures of the tombs at this site, visible in both the large status tombs and the smaller tombs, suggest that different mortuary practices occurred side by side. In other words, the funerary records at Abu Rawash attest to multiple distinctive mortuary practices and this suggests that different groups lived side by side in a stratified community.[1] Based on tomb dimensions and layout, it seems safe to assume that the owners of the tombs in the Lower Cemeteries probably represented the middle and lower social classes of the local community. The large and richly refurbished tombs at cemetery M most likely belonged to the highest social strata of that same community. Social stratification and different mortuary practices in a single cemetery were common in First Dynasty Egypt, but the precisely dated combination of the two phenomena at Abu Rawash provides a solid base for further research and analysis.

The hypothesis addressed in this study will be that all tombs from cemetery M were built by and for the local community. The layout of the cemetery and the clustering of the tombs suggest that the social fabric of the area was an important factor in the choice of the location of the cemetery and the tombs. There is no doubt that the state was involved, the funding of (parts of) the provisions for the tombs derived from state institutions. However, that does not oppose a local base for the process of decision making and funding or a local input for expertise, experience and skills of construction activities.

In the first sections of this study, the tombs and the cemeteries will be analysed within the context of the Abu Rawash mortuary landscape. It starts with a brief description of the tomb specifics, followed by a comprehensive analysis of the nature of cemetery M; including the social and economic aspects of tomb construction. The resulting information will then be used to propose a new explanation of the development of cemetery M, the ownership of the M-tombs and the organisation of tomb construction at the site.

1 The similarities between the elite tombs on hill M and the tombs in cemetery "1957" were recognised by Klasens (1957: 64) from the start. However, he did not explore this issue any further.
Klasens started with the name Cemetery "1957" (Klasens 1957), but the idea brought up by Hendrickx (1989 IV: 93) to refer to this with Cemetery 000 makes much more sense and will be followed in this study.

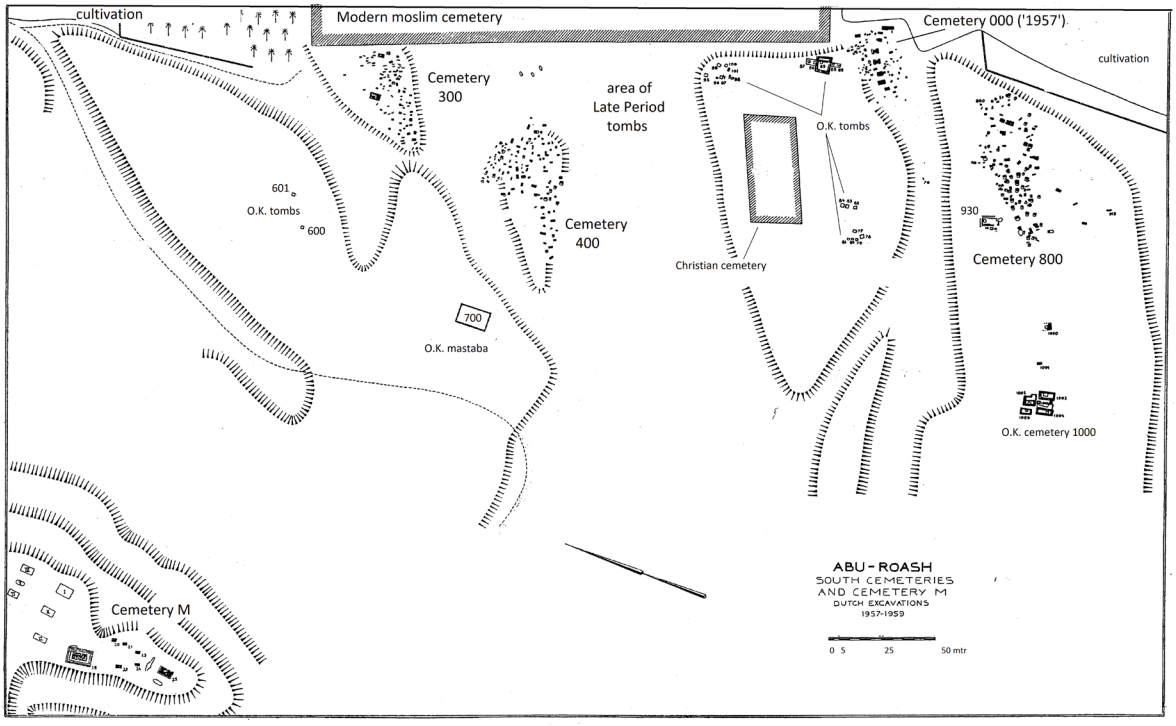

Fig. 1 Abu Rawash site with Early Dynastic and Old Kingdom cemeteries (after Klasens 1961: fig. 13)

SETTING THE SCENE: TOMB MORPHOLOGY AND CHRONOLOGY AT ABU RAWASH

In the late 1950s, Adolf Klasens excavated, on behalf of the Leiden Museum of Antiquities, at Abu Rawash four cemeteries of the middle and lower social classes (cemeteries 000, 300, 400 and 800) and seven tombs at elite[2] cemetery M (fig. 1). The results of the three campaigns were published in a series of preliminary reports (Klasens 1957–1961). An extensive description or a comprehensive study of the results of the excavations were never made.

In 1989, Stan Hendrickx re-appraised the pottery as reported by Klasens and was able to assign most of the tombs a more precise date (Hendrickx 1989 I: 280–282; Hendrickx 1989 IV: 93–130). Recently, Yann Tristant returned to cemetery M and re-excavated all tombs and discovered many new finds and features (Tristant 2008a, 2016 and 2017).

As part of a broader re-evaluation of the collection of the excavation documents, also known as the Abu Rawash archive,[3] currently held by the Leiden Museum of Antiquities, the

2 The term "elite" is loosely used in this study. Tomb dimensions are commonly seen as indicator of social rank and this concept applies to cemetery M and the Lower Cemeteries. Access to cemetery M was apparently restricted; it is therefore assumed that the owners of the M-tombs belonged to a privileged group, most likely the (local) elite.

3 The Abu Rawash archive (in various spellings) consists of the excavation notes made by Klasens and his assistant F. van Veen during the three excavation campaigns in 1957–1959. The notes include sketches, find registrations, excavation photographs, object drawings, draft plans and diaries. These

morphology of the tombs has been re-assessed.[4] The revised classification encompasses both the smaller burials of the Lower Cemeteries and the status tombs at cemetery M (tab. 1).

TOMB MORPHOLOGY: A REVISED TYPOLOGY

A simplification of the twelve tomb classes devised by Klasens (1957: 64–67) shows that there were basically three significant variations in the design of tomb substructures at this site. These variations can be recognised in both the M-tombs and the middle and lower class tombs (Ormeling 2021: 627; Ormeling, *forthcoming*). Unfortunately, there were hardly any superstructures left at the Lower Cemeteries, this prevents the incorporation of these important features of the tombs of the lower and middle classes in the revised classification.

The basic form of the burial chamber was the simple pit grave, without any treatment of the sides of the pit. The body was laid to rest within a burial container that could vary from a (simple) reed mat to a (painted) coffin (Klasens' classes 1–5 and 8; revised type I-A; tab. 1).

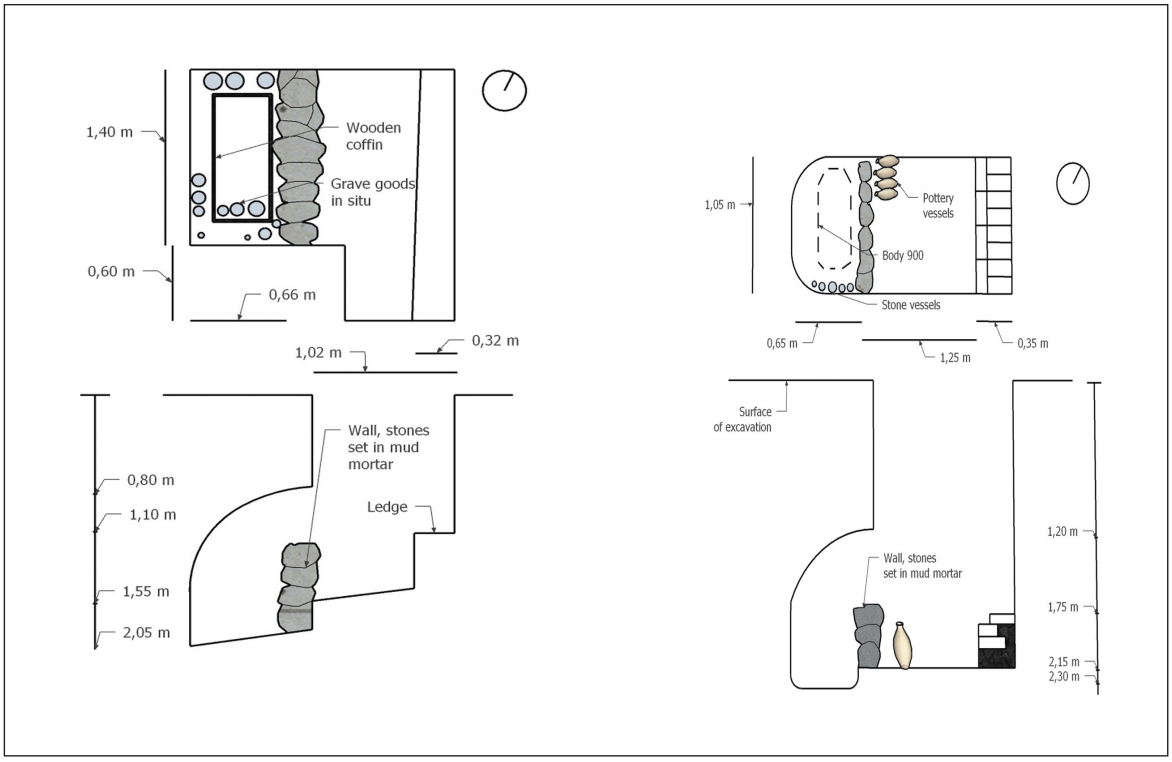

Fig. 2 Examples of "lateral niche" burials 893 (left) and 900 (right); undisturbed burial 893 shows the deposition of grave goods, burial 900 had a step (ledge) built with stones, mud and mud bricks after the shaft was dug to the appropriate depth; both burials show the deeper niche (drawing M. Ormeling, based on Klasens' unpublished Field book 1959 II)

documents have been made available to me for further study and I would like to express my sincere thanks and appreciation for this opportunity to the Leiden Museum of Antiquities.

4 An extensive description and analysis of the different types of tombs found at the Lower Cemeteries will be published in a forthcoming monograph, including construction particulars (Ormeling, *forthcoming*).

A second type of grave design that occurred frequently was a straight shaft, with a burial niche at one side at the bottom (fig. 2); in many cases the niche was sealed off with a wall made of bricks or stones (Klasens' type 6, "lateral niche" tomb). In the revised classification, the simple form will be type I-B, while the more elaborate form, frequent in tombs at hill M, is labelled type III-A (tab. 1). The distinction lies in the elaborate design and size of the burial niche(s) and the superstructure.

At Abu Rawash, burials of this type came in all sorts of sizes and variations at the Lower Cemeteries. These types of burials have been registered at other sites. George Reisner (1936: 52–56) described some of them found at El-Amrah, El-Ahaiwah and Ballas. They also occur in the wider Memphite area, but apparently not as frequent as at Abu Rawash.[5] However, elite burials of this type are (as yet) only/mainly[6] encountered at Abu Rawash, with the exception of mastaba S3035 at Saqqara (see below).

The "lateral niche" burials (type I-B) were definitely not simple or poor, several of these burials were found undisturbed and had large assemblages of grave goods (fig. 2 left; Ormeling, *forthcoming*).

Revised tomb type		**Cem. 300**	**Cem. 400**	**Cem. M**	**Cem. 000**	**Cem. 800**	*totals*	
I-A	Simple pit grave	19	39		44	23	125	28%
I-B	Straight shaft with lateral niche(s)	5	29		6	74	114	25%
III-A	Shaft with niche(s) and elaborate superstructure			12		1	13	3%
II	Brick-lined tomb	36	41	7	19	12	115	26%
III-B	Brick-lined tomb with elaborate superstructure			1			1	0%
II-C	Subsidiary burials			66			66	15%
--	"other"	3	4	1	4	3	15	3%
		63	113	87	73	113	449	

Tab. 1 Number of tombs per cemetery per revised types

A third type consisted of a substructure with a "constructed burial space" (fig. 3); the construction of the burial chamber and/or subterranean storage rooms was often made of mud bricks, but sometimes stones or mud packings were used ("brick-lined" tombs; Klasens' classes 7 and 9–12).

5 Some examples are (not exhaustive): Abusir burial 12 B (Bonnet 1928: Taf. 2, no 12 B, 6); Turah 9.0.2 (Junker 1912: 24, Taf. XXV); Helwan Op. 4/2 (Köhler 2008b: 119, fig. 7), Op. 4/46 (Köhler *et al.* 2014), Op. 4/96 (Köhler *et al.* 2017).
Note: the "lateral niche" tombs were not found at Kafr Ghattati (Engles 1990), just a few kilometres south of Abu Rawash.

6 Some tombs at Helwan may be of a similar design, but the bad state of preservation or the frequent intrusive later burials prevents (as yet) a thorough analysis of the superstructures.

The number of storerooms, for Klasens an important criterion, does not affect the underlying idea of burying the deceased in a constructed "house for eternity" ("Modellhaus", Lacher-Raschdorff 2014: 210) and is therefore not a decisive factor in the revised classification. Tombs with a constructed burial space with a simple mastaba superstructure are revised type II, and type III-B for the tombs with more elaborate features at the surface (tab. 1).

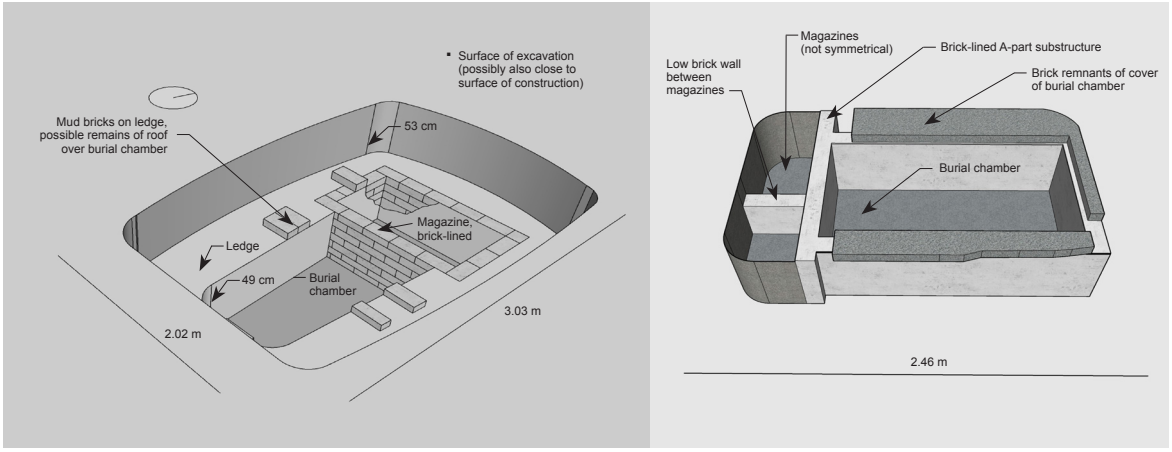

Fig. 3 Tombs M22 (left) and M23 (right) in a 3D perspective; both tombs show the practical construction method, with some rooms lined with brick walls and other not lined (drawing M. Ormeling, based on Klasens' unpublished Field book 1959 II)

SUBSIDIARY BURIALS AT CEMETERY M

The subsidiary burials of the elite tomb complexes can be seen as a sub type of the brick-lined tombs. Most of these tombs consist of brick-lined rectangular tombs in a row that were made in a trench-like pit (Montet 1938: pls. II, V; Tristant 2008b: 332–333). They are a significant part of the Early Dynastic burials at Abu Rawash, some 66 subsidiary tombs have been excavated (tab. 1).

They are treated as a distinct sub-class due to their role in the funerary complex of the owner of the main tomb. These tombs are found in groups, their design is part of the layout of the tomb of another individual and the people buried in the subsidiary tombs were, most likely, not involved in the process of decision making about design and location (Janulikova 2017: 39, "...elite construct..."). Therefore, the subsidiary tombs cannot be compared directly to "individual" tombs in general cemeteries. In the revised classification they are labelled type II-C (Ormeling, *forthcoming*).

The results of the revised classification of the tombs are presented in tab. 1.[7] The number of subsidiary burials is probably not representative.[8] The three main types of tombs – types I-A, I-B and II (without II-C) – represent each about a third of the middle and lower class burials.

7 Each of the Lower Cemeteries had a few tombs that would fall in type "other" (tab. 1); they are not relevant for this study. For example, two tombs with stairways leading into substructure (burials 836, 846, Klasens 1960: fig. 14), the only two stairway tombs in all cemeteries of Abu Rawash (Ormeling, *forthcoming*).

8 It is highly likely that in antiquity the Early Dynastic middle class cemeteries extended beneath the Muslim cemetery, the cultivated fields and – probably – beneath the Late Period burials (Klasens 1958b: 32–33; Baud *et al.* 2003: 21–22; see fig. 1 here).

CHRONOLOGY OF CEMETERIES AND TOMBS

The dates of the tombs at cemetery M are securely established (tab. 2). Several of the tombs contained inscriptions with the name of king Den, most of the others are dated to the Naqada IIIC2 period; only a few cannot be dated by lack of datable objects or re-use in antiquity (Tristan 2017: 489, footnote 14). This leads to the conclusion that these 20–21 tombs were constructed during a limited span of time of 80–100 years (Hendrickx 2006: 92, tab. II 1.7).

period	Lower Cemeteries			Cem M			
	I-A	I-B	II	II	III-A	III-B	II-C
Naq IIIB	9	1	21				
Naq IIIC1	32	16	45				
Naq IIIC2	12	8	3	7	12	1	66
Naq IIID	70	83	32				
unknown date	7	5	8		1		
tomb dates adjusted		332	91%		86	98%	
tombs other		14	4%		1	1%	
tombs undated		20	5%		1	1%	
		366			88		

Tab. 2 Chronological developments in tomb types, combined in all cemeteries

The tombs in the four Lower Cemeteries (fig. 1) were dated to Zero to Second Dynasties by the excavator, with a temporal shift from north to south (Klasens 1960: 70). In 1989, Hendrickx re-assessed the dates of the individual tombs, based on the pottery registered.

The cemeteries 300 and 400 show differentiation (Hendrickx 1989 I: 281) and are dated Naqada IIIB–IIIC1 and Naqada IIIB–IIID respectively (Hendrickx 1989 IV: 99–116; Hendrickx – van den Brink 2002: 349). Cemeteries 000 and 800 are both dated Naqada IIID (Hendrickx 1989 IV: 93–99, 116–126; Hendrickx – van den Brink 2002: 349).

Using the information from the field notes (Klasens Field books 1958 I–II, 1959 I) it is possible to assign a date to most (95%) of the undated burials in cemeteries 300 and 400. The outcome is presented in tab. 2 and chart 1.

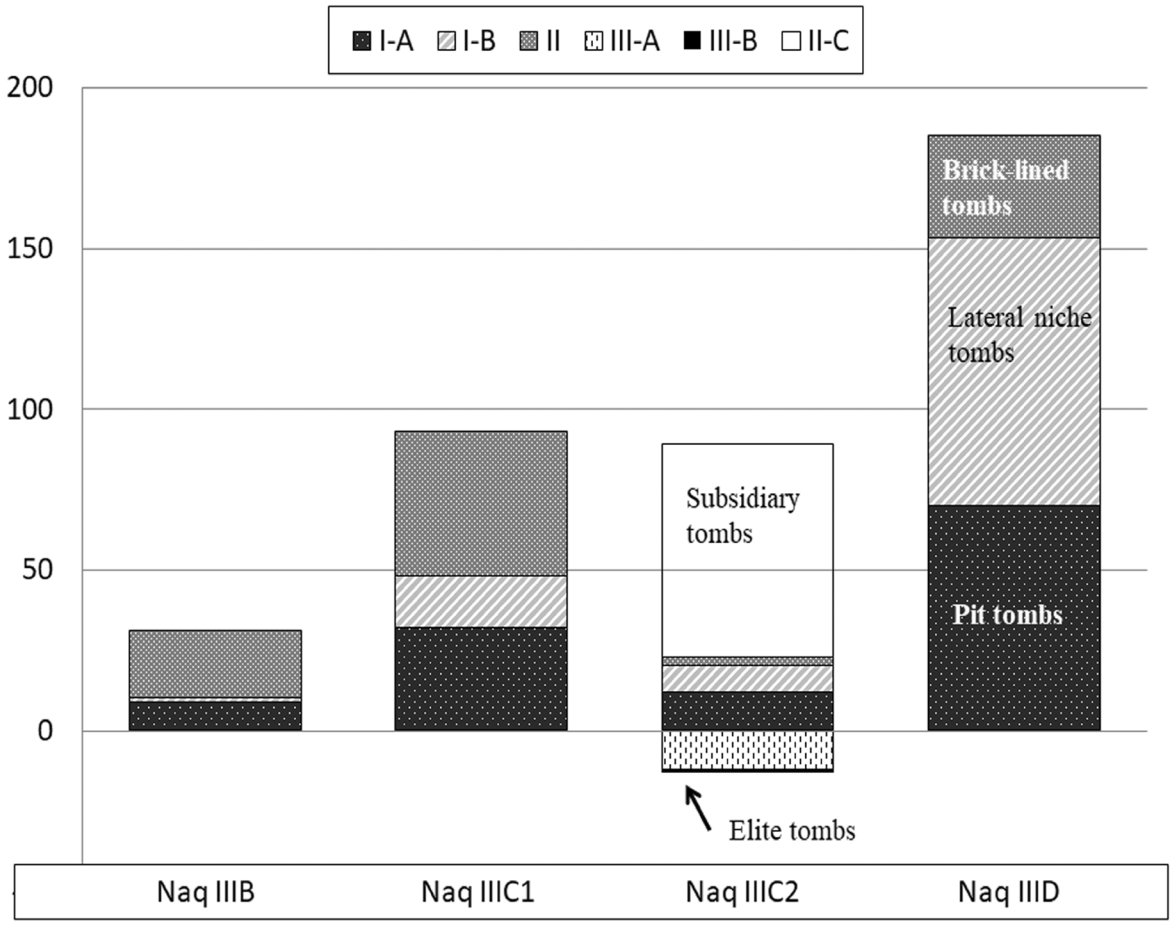

Chart 1 A graphic presentation of the chronological developments in tomb types in the Lower Cemeteries, combined with the elite tombs at Cemetery M

There is apparently no chronological development in tomb type; the archaeological records of the Lower Cemeteries show the presence of the different tomb types from the start to the end of the sequence of these burial grounds.

At a first glance, it seems that the "lateral niche" burials (type I-B) first appear during the Naqada IIIC1 period (tab. 2, chart 1). This makes it tempting to see them as a prelude to the large elite tombs at cemetery M and the successive growth of that type of burials in Naqada IIID. Some caution is needed; it cannot be excluded that cemetery M "attracted" people with an affinity for "lateral niche" burials and provoked a bias to this type in the nearby Lower Cemeteries. The slump in the number of burials during Naqada IIIC2 catches the eye, but is more difficult to explain. It cannot be excluded that the people belonging to the group with the "lateral niche" affinity were eligible to a burial in the subsidiary graves at the higher status cemetery M (see below).

Another consideration is the difference in duration of the periods on the horizontal axis. The duration of Naqada IIID is yet uncertain and even the time spans of Naqada IIIC1 and IIIC2 are different in the number of years (Hendrickx 2006: 92, tab. II 1.7).

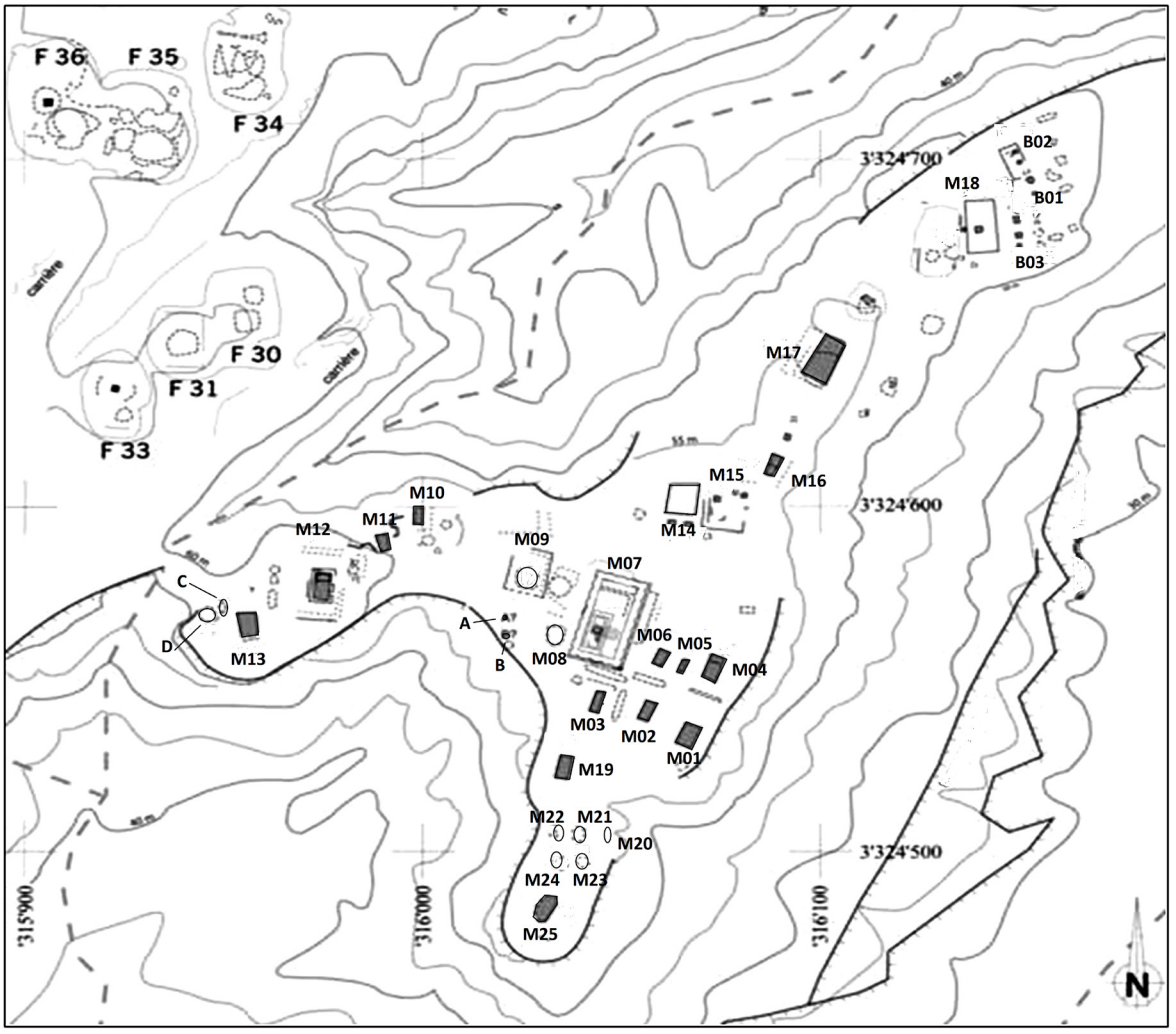

Fig. 4 Plan of cemetery M (after Baud 2005: fig. 3): First Dynasty tombs excavated by Pierre Montet (1913–1914: M01–M18) and Adolf Klasens (1959: M19–m25); F- and B-tombs date to the Fourth Dynasty

CEMETERY M IN CONTEXT

Cemetery M contains a variety of tombs (fig. 4), mostly large "typical" First Dynasty elite funerary complexes (see below), but one third of the burials consist of smaller tombs. The main characteristics of the First Dynasty M-tombs are presented in tab. 3.[9,10]

9 A complete description of the First Dynasty tombs is presented in the excavation reports of the original excavators (Montet 1938 and 1946; Klasens 1961; Tristant 2008a, 2008b, 2016 and 2017).

10 Several tombs are not included in the analyses in this study. Tombs M09, M14, M15, M18 and B1–B3 (excavated by Fernand Bisson de la Roque in 1923, and renamed; *cf.* Bisson de la Roque 1924) are dated to the Fourth Dynasty, although M14 and M15 may have had an earlier origin and may have been re-used First Dynasty tombs (Tristant 2017: 489, footnote 14). The four pits A–D, near tombs M09 and M13, remain enigmatic (Montet 1938: 49–50, 59–60).

Tomb	type	date	Ramifications				Characteristics		
			Encl. wall	Niched façade	Boat grave	Subs. burials [#]	Footprint superstr. [m2]	Volume substr. [m3]	Lay-out substr. [bur. ch + mag]
core									
M01	III-A	Den	X	X	X	7	170	42	1 + –
M02	III-A	Naq IIIC2	X	X	X	5	128	21,7	1 + –
M03	III-A	Den	X	?	X	6	96	16,3	1 + 3*
M04	III-A	Naq IIIC2	X	?	X	5	126	–	1 + 1
M05	II-A	Naq IIIC2	–	?	–	–	–	2,4	1 + –
M06	III-A	Den	–	?	X	2	–	10	1 + 1
M07	III-A	Naq IIIC2	–	X	–	8	338	17,9	1 + 3
M08	II-B	Naq IIIC2	–	?	–	–	50 (?)	4,5	1 + 2
M19	III-A	Naq IIIC2	X	straight	–	–	51	29	1 + –
west									
M10	III-A	Naq IIIC2	–	–	–	–	*unclear*	75,4	1 + 2
M11	III-A	Naq IIIC2	–	–	–	2	*unclear*	42,9	1 + 3
M12	III-A	Den	X	–	–	19	300	70	1 + 3
M13	III-A	Naq IIIC2	–	–	–	1 (?)	–	21,3	1 + –
south									
M25	III-B	Den	–	–	X	3	–	19,7	1 + 4
M20	II-B	Naq IIIC2	–	–	–	–	–	4,3	1 + 2
M21	II-B	Naq IIIC2	–	*straight?*	–	–	*unclear*	5,6	1 + 2
M22	II-B	Naq IIIC2	–	–	–	–	–	5,2	1 + 1
M23	II-B	Naq IIIC2	–	–	–	–	–	4,4	1 + 2
M24	II-B	Naq IIIC2	–	–	–	–	–	4,9	1 + 2
north									
M14	–	?	–	–	–	–	–	–	*unclear*
M15	–	?	–	–	–	–	–	–	*unclear*
M16	–	?	–	–	–	–	–	–	1 + 1
M17	–	Naq IIIC2	–	–	–	9	–	132	1 + –

* Two burial chambers and two magazines can be considered

Tab. 3 Overview of the characteristics of the First Dynasty tombs in cemetery M

CEMETERY M IN RELATION WITH CONTEMPORARY ELITE MASTABAS

In the past, the elite tombs at Abu Rawash have been compared with similar tombs at sites like Saqqara North, Tarkhan, Giza, Abu Ghurab and Naqada. In almost all cases, the striking similarities in the architecture of the superstructures and in find assemblages (luxury items, inscribed tags and labels) are mentioned (*e.g.* Helck 1984; Jeffrey – Tavares 1994: 143–154; Tavares 1999: 700–704; Cervello-Autuori 2002; Cervello-Autuori 2017: 211–215; Hendrickx 2008: 60–72; Lacher-Raschdorff 2014: 199–250). The same objects, or very similar ones, were found in the royal tombs at Abydos.

In the first part of the twentieth century, when most of the excavations took place, this led to a discussion about the ownership of these tombs. The size and elaborate assemblage of grave goods, with names of kings, led many to believe that the large mastabas were the

tombs of the early kings; others suggested they were tombs for queens of for high officials of the state.[11]

The possible involvement of the royal court has influenced the archaeological debate from the start. One of the consequences of the focus on the state's involvement in the construction of the tombs, to ascertain (royal) ownership, is that the limited attention for the individual tombs prevented a wider archaeological study of the tombs in the context of the cemeteries. The special attention to extraordinary tombs at Saqqara North like S3038 (stepped core), S3505 (sanctuary) or S3705 (tumulus) reflects that focus, each exceptional feature in these tombs was seen as evidence for royal ownership (Cervello-Autuori 2017: 223–224 and tab. 4). That each of the contemporary elite cemeteries showed distinctive characteristics, like layout, horizontal development, accessibility and local interrelations, was hardly part of the debate.

Saqqara North stands out for its very large and "unattached" tomb complexes along the edge of the escarpment. During the First Dynasty, access to Saqqara North was controlled in a very strict manner (Ormeling 2021: 624 and fig. 8, with references). Although in some cases, a grouping of one or two tombs can be suspected, the tombs were spread along the edge of the escarpment. The tombs had a relation with the habitation in the valley – presumably the capital (Helck 1984: 387–388; Jeffrey – Tavares 1994: 149) – but not with any other cemetery in the vicinity. There is no straightforward order in the location of construction; choice of location was clearly not regulated (Ormeling 2021: 627, with references).

The character of Saqqara North changed during the reign of Den. From this reign onwards, the design of the tombs showed more variety and creativity (Lacher-Raschdorff 2014: 213; Ormeling 2021: 626–627), but access remained restricted. Saqqara North became a more "communal" cemetery during the Second Dynasty, with a mix of tombs in size, spacing and elaboration.

The elite tombs of the First Dynasty varied in dimensions, but looked from the outside very similar. However, it was within the mastaba body proper that innovative elements were introduced. These innovations were not "public", they were only known to the owners and – likely – to their social circles, the highest strata of society. In line with the above mentioned line of thought, it is safe to assume that these innovations were related to the mortuary beliefs – or more accurately defined: mortuary practices – of the owners. It is difficult to associate them with the ideology of the state.

It seems also safe to assume that the tombs were all equipped with a set of attributes.[12] Although some tombs seem to miss some of these elements (Hendrickx 2008: tab. 2). The apparent lack of these elements may find a background in the manner of excavation and reporting by the early excavators, who left later intrusive burials out of their publications (Ormeling 2019: figs. 6 and 7; Ormeling 2021: 615–617).[13] As Eva-Maria Engel (2013: 21) has argued, a kind of "template" of tomb design may have existed for this high level of tombs.

11 For an extensive narrative of the discussion about the royal and elite tombs of the First Dynasty, see Hendrickx (2008: 61–72) and Cervello-Autuori (2017: 211–220); a recap of that debate is beyond the scope of this study.

12 Features like subsidiary tombs, boat burials, enclosure walls and pavements ("ramifications", Emery 1939: 10).

13 This issue may be important in the discussion about the meaning and developments of the subsidiary burials during the First Dynasty. It is quite likely that the early tombs S3357, S2185 and S3471 were

The elite cemeteries at Abu Rawash, Giza, Abu Ghurab and Tarkhan shared a relation with burials of lower classes in the direct vicinity. The low number of elite tombs at Tarkhan and Abu Ghurab, just one to three, prevents an analysis of the context of that interrelation. The situation at Giza is not very clear, the tombs are heavily disturbed and not much information is available.

CEMETERY M LAYOUT AND PLAN

The character of cemetery M is different, the number of tombs is much higher (*ca.* 21) and the tombs are constructed in a compact plan (fig. 4) and within a short period (see above). It is possible to distinguish four sections in the cemetery (Tristant 2017: 489). The core of the cemetery is formed by the dense cluster of tombs in the centre of the elongated hill, with three extensions: one group in the south, one towards the west and a row of tombs towards the north (fig. 4). The First Dynasty tombs in the northern section, mastabas M16 and M17, were never really excavated by Montet and were found heavily damaged during recent re-excavations (Tristant 2017: 489–492). The date of M17 could be secured to Naqada IIIC2 (Tristant 2017: 490).

The core cluster, the tombs M01–M08 and M19, shows a concentration of mastabas with a similar design of the substructure: a pit with a (much) deeper shaft with a lateral burial chamber and storage spaces. The large tombs were equipped with boat graves at their north side. The exception to this apparent rule is M08, a tomb with a brick-lined substructure. The tombs were built in a compact pattern, aligned in a slightly varying direction and build in rows in an east-west direction. The position of tomb M19 seems a bit off, either the distance between M03 and M19 was originally filled with a boat grave, or M19 was a later addition. The compact pattern suggests a conscientious choice by the owners, and point to a social relation between the owners. The shared mortuary practices suggest a shared social history, like in a family or kin group.

A second cluster is made up by the brick-lined tombs M20–M25, with M25 as the main tomb and the other five smaller tombs as possible satellites or associates. The different design of the substructure suggests a (kin?) group with other mortuary practices than those of the core cluster. The layout of the superstructure of M25 (fig. 6 and chart 2), a large tomb with a boat grave (M25B) and subsidiary tombs (M25A),[14] is apparently similar to the other tombs. Again, the orientations of the substructures are slightly varying, how that related to the orientation of the superstructures remains unknown. Note that the pattern of interaction between M25 and the five smaller tombs (M20–M24) is not congruent with the interrelations between the tombs in the core cluster. It is difficult to assess the significance of this; it may be caused by the available space in the south part of hill M.

originally equipped with subsidiary graves and other attributes. The small tombs S2188 and S2190, excavated by James Quibell (1923: 15–17 and pl. I), were most likely subsidiary to the larger S2185. The constellation shows an interesting resemblance to the situation around S3503 (Ormeling 2021: 618 and fig. 2). The "Model Estate" associated with S3357 (Emery 1954 IV) suggest that already the first tomb at Saqqara North was equipped with such features.

14 Recent re-excavations have shown that feature M25A was indeed a row of subsidiary burials (Yann Tristant, personal communication, June 2018).

The distance between the core cluster and large tomb M12, and associated tombs M10, M11 and M13, suggests that the owners of the latter tombs had no direct relation with those of the core cluster. Both groups shared the same design of the substructures of their tombs, although no boat graves were found with these tombs. They probably shared mortuary practices. However, the distance between the clusters seems quite clear and likely points to different (family or kin) groups.

The tombs M14–M17 were apparently not really grouped, and an interrelation between these singular burials in a row along the northern part of the hill is less obvious to define. They stand out by their dislocation and the regular spacing along the axis of the ridge of the hill. Tomb M17 had a different design of the substructure, not fitting in with either the brick-lined tombs or the 'lateral niche' type (Tristant 2017: 490–492 and figs. 30–31). The original date of tombs M14 and M15 is unclear; re-use during the Fourth Dynasty prevents an analysis of the original situation.

The four sections (or clusters) seem to represent an order of construction, as Tristant (2017: 489) proposed. Conversely, it cannot be excluded that the distinct clusters were developed contemporary, given the limited period of construction during Naqada IIIC2. Five of the tombs can be dated to the reign of Den: M01, M03, M06, M12 and M25 (tab. 3).

A "template of design" can be assumed for cemetery M (tab. 3). It reflects that of Saqqara North, although large pavements or 'model estates' (Emery 1954: 171 and pls. LVII–LXVI) appear to be missing. It may signal a difference in social status of the owners, although effects of post-depositional processes of decay or damage cannot be excluded (Tristant 2016: 155).

The larger tomb complexes had a (limited) number of subsidiary burials (tab. 3). Only tomb M12 stands out with 19 burials. These burials seem to express the status and prestige of the owner of the main tomb, although ownership of the subsidiary burials is still in debate (Morris 2007b: 17–21; Vaudou 2008: 148–168; Kelly 2019: 92–105).

Part of that debate is whether the owners of the subsidiary burials were killed (sacrificed) at the funeral or not (Cervello-Autuori 2002: 38; Vaudou 2008: 161–163; Midant-Reynes – Tristant 2020: 45–46, 51–52). There are some relevant archaeological attestations. Montet (1938: 17 and pl. II) described one layer of bricks that covered the subsidiary burials of M01, suggesting a contemporary burial of all graves. Tristant (2016: 166) found several subsidiary burials of M12 ceremonially decommissioned, they were filled with liquid mud and not used for burials. Such an act seems to point to an over-dimension of the tomb complex in terms of subsidiary burials at the time of design and construction. Subsequently, they were "taken out of service" at a later moment. Apparently, it was not deemed necessary to fill the graves with non-voluntary retainers.

The inscribed labels and tags found in multiple tombs confirm that the king and/or the state were involved with the provisioning and – maybe – the construction of the tombs. The goods associated with these inscriptions were likely produced by one or more of the state's institutions, as the labels attest (Morris 2007a: 186–187). The lack of inscriptions in the other tombs does not imply that these goods could not have been delivered by the state from one of its institutions.[15]

15 Did the non-sealed containers originate from non-state institutions or were the goods not eligible for sealing?

The owners of the larger tombs are not directly identified by name tags or other inscribed artefacts. Four stelae with personal names were found in or near the smaller tombs, three by Montet (1946: 180–181, pl VI) and one by Klasens (1961: 121, fig. 7).

One limestone stele was found in tomb M06 (Montet 1946: 180), one near M20 (Klasens 1961: 121); both were roughly hewn limestone steles with a rounded top, with a name incised with a sharp object. Two other stelae were found in subsidiary tombs of M01 (Montet 1938: 23; Montet 1946: 180–181); on these stelae the names were shown in low relief within a rectangular frame that appears to be the sign *ḥwt* (Montet 1946: 181).

Cemetery M shows an internal social hierarchy of the tombs, on top of the distinction to the Lower Cemeteries. Although the poor state of preservation prevents a complete analysis, the large(r) tomb complexes show interrelations with medium tombs like M05, M08 and the group M20–M24 that are of a different nature than the relation with the subsidiary burials. Tomb M17 seems to stand apart, tomb M19 may be a later addition to the core cluster although a "stand-alone" position cannot be ruled out.

With some reservation, it can be observed that this configuration of tombs seems to reflect the dynamics of an active and diverse community. Hypothetically, one could interpret the occupants of the large tomb complexes as members of the elite, the people in the smaller tombs were probably members of their households or lower status officials. In my opinion, the occupants of the subsidiary graves would probably have been servants, but could also have been 'lower status' family members. Whatever the family or social relations may have been, they made the occupants eligible to be buried at hill M. The question remains in what social way they differed from the people buried in the Lower Cemeteries.

CEMETERY M AND THE RELATION WITH MIDDLE AND LOWER CLASS TOMBS

The burials at hill M are all larger and more elaborate built than the burials in the Lower Cemeteries. They share multiple design and construction features with their smaller counterparts in the low desert, but interesting differences occur.

The construction of the brick-lined tombs, both in the status and the middle class cemeteries, is quite regular and reflect the way of brick construction that is also found at other sites. The construction of the substructure of M25, M20, M21 and M24 share professional construction methods: straight walls of considerate width, well-laid brick work and plastered walls. The construction appears as a "professional job" and contrasts with the more "practical" way of construction of M22 and M23 (fig. 3). The five smaller tombs had about the same dimensions.

The "lateral niche" tombs in the elite cemetery (type III-A) had many specific features in common with their counterparts in the Lower Cemeteries (type I-B) (Ormeling, *forthcoming*). The substructures of both larger and smaller tombs were cut in the rock subsoil. The walls of shafts and niches – the actual location of the burial – were left untreated, with an occasional exception. The niches or chambers were often cut out deeper than the shaft, sometimes at an angle. The niches of the smaller burials in the Lower Cemeteries were in most cases closed with a wall made of mud bricks or stones set in mud mortar. The burial chambers of the status tombs were closed with large dressed portcullis stones (*e.g.* Tristant 2016: 165, fig. 10; Tristant 2017: 469–471 and figs 7, 21). In cemetery 800, chronologically later than cemetery M,

some "lateral niche" tombs had a large rough stone to close the niche; maybe "an echo" of the practice of dressed portcullis in the status tombs (Ormeling, *forthcoming*).

Some burials had a ledge or step in the shaft, opposite of the niche. Sometimes they were created during the digging of the shaft, in other cases they were made with bricks or stones (burial 900, fig. 1) or brick walls (M01: Tristant 2017: 479). The constructed steps seem to point out that such ledges probably had a (ritual) meaning and were not just efficiency measures (reduction of soil to excavate).

CEMETERY M AS A CEREMONIAL LANDSCAPE

The transition of hill M into a cultic site was a relatively rapid development; within the reign of king Den at least five large tomb complexes and probably a few smaller tombs were erected at the hill (tab. 3). It could have been a royal initiative (Cervello-Autuori 2017: 225), but an enterprise by one or more locally based officials seems more likely (see section Discussion below).

The large visible tomb complexes would have established a ceremonial relation between the land and the different kin groups (Dalton *et al.* 2015: 5; Sullivan 2020). The growing collection of tombs would have created a ceremonial site for the descendants of the people buried in the main tombs, in the subsidiary graves and in the smaller individual tombs. The repetitive funeral processions would have had impact on the social identity of the community and social relations with these structures would be re-established (Gramsch – Meier 2013: 194; Dickinson 2014: 76–77, with references).

The short "span of life" of the cemetery means that the people buried at hill M were probably actively remembered by larger parts of the community. The site would have become a focus for the funeral processions and for the regular offering rituals to the deceased ancestors; such communal gatherings and festivities would have strengthened the social relations and provided opportunities to distribute food or commodities (redistribution of resources).

The cemetery was abandoned at the end of Naqada IIIC2, but remained important. During the Second Dynasty/Naqada IIID there were, as far as we know, no status burials in the hills above the low desert. However, during the Third Dynasty a brick tomb structure (or pyramid?) was constructed (Lepsius 1849: 21–24, Bl. 11–12; Swelim 1987) nearby and during the Fourth Dynasty the site became the burial place for King Djedefre and members of his elite (cemetery F). The background of that development is beyond the scope of this study (Baud *et al.* 2003).

CEMETERY M AS A CONSTRUCTION SITE

Besides the ceremonial effect that the activities at cemetery M would have had, there was also an economic side to the repeated building projects. The frequent construction activities on the hill, within a time frame of 80–100 years (see above), meant that successive generations in the local community would have witnessed the economic impact of the construction of the tombs and the funerals processions. A reconstruction of the expenditure – in terms of required construction skills, required manpower and likely duration of construction – provides quantitative information about the economic investments in the construction of the tombs.

There may have been other positive consequences for the local community. The repeated construction activities may have created a work pool of skilled craftsmen, on which the state

and its institutions would have been dependent (Dickinson 2014: 77). The tombs at cemetery M stand out by their extensive subterranean spaces, cut out from the bedrock; these activities would have created a work force with the skills, experience and tools to work stone besides construction with mud bricks.[16]

MODELLING THE LABOUR ORGANISATION DURING THE NAQADA IIIC2 PERIOD AT ABU RAWASH

In recent years, several scholars have addressed the issue of labour of construction (Dickinson 2014: 222–271; La Loggia 2015; Engel 2017: 83–84; Lacher-Raschdorff 2014: 103–136; Ormeling 2016 and 2017). It has become clear that these studies provide reliable data about the likely work flow, expenditure and duration of activities. The outcome should be treated with caution. After all, they remain a modern reconstruction of past behaviour of which no contemporary sources are available.

The first step below is to quantify the efforts of construction of the M-tombs, based on representative examples. The actual numbers of required labourers and labour days allow for a reconstruction of the organisation of construction labour (tab. 4). The next step is to assess the local situation of the construction site.

Cemetery M		Example tomb	Estimated expenditure				Remarks
			Duration (nett days)		Workforce		
			Pre-burial	Post-burial	Skilled	Unskilled	
Tier A	M07, M12	M07	165	10–20 (?)	10–15	130–150 max; 30–40	Post-burial activities largely dependend on how the store rooms inside the mastaba were used and/or covered; estimated height 4.5 meter.
	M01, M02	M01	160	unknown	10–20	130–150 max; 30–40	Estimated height of the mastaba of 4 meter and enclosure wall of 1.5 meter; note that M01 is more compact constructed than M07.
Tier B	M03, M04; M06, M10; M11, M13, M19; M25	M19	45–50	10	3–5	20–35	Based on a height of the mastaba of 3.50 meter and of the enclosure wall of 1.00 meter.
		M25	80–90	10 (?)	3–5	50 max; 15–20	Dimension of superstructure re-interpreted. Post-burial activities largely dependend on how the store rooms inside the mastaba were used and/or covered.
Tier C	M05; M20–24	M21	15	10	––	4–8	Based on the assumption that the superstructure is built after the burial; height mastaba 1.60–1.80 meter.

Tab. 4 Expenditure of example elite tombs of cemetery M

16 It is tempting to speculate about the possible role the Abu Rawash craftsmen could have had in the construction of mastaba S3035 at Saqqara North.

The estimates of the expenditure of mud brick structures are based on a reconstruction of the work processes and production rates in antiquity. An example of the methodology is given in the appendix for tomb M25 (below), based on a "best effort" assessment. The reconstruction of M25 is chosen for its distinctive design of the substructure.

MODELLING THE EXPENDITURE

In the case of the status tombs at Abu Rawash, a representative sample of tombs is used to assess the expenditure of the construction (tab. 4). The sample tombs provide a reliable overview for the labour required for all tombs and assess the overall expenditure.[17]

The two largest tombs are represented by sample M07 (tier A, tab. 4). However, tombs M01 and M02, although smaller in footprint, appear to have a comparable expenditure and are therefore also assigned to tier A (see below). The majority of the large tombs (tier B) are represented by M19 and M25. Tomb M21 stands for the small brick-lined tombs (tier C).

The results are primarily meant to show the order of magnitude of the workforce, separated in skilled and non-skilled labourers, and the approximate duration of the work.

As the data in tab. 4 shows, the largest tombs at cemetery M could have been erected in a time span of a little over half a year (including days off), by a workforce of *ca.* 150 men at its peak (making and transporting bricks) and 30–40 workmen under supervision or guidance of 10–20 skilled constructors.[18]

Interesting is also the outcome for the smaller tombs (tier C), they could be constructed by a relatively small workgroup in a matter of 3–4 weeks. The level of required skills to build these smaller tombs would have been quite low, basically the experience one gained as an unskilled worker during work on a larger tomb.

Remarkable is the similarity in expenditure for tombs that appear to be very distinctive in size. The compact and massive construction of tomb M01 – footprint only 170 m² (tab. 3) – leads to a construction effort that was equal to that for the much larger but "airier" M07 (338 m²); a warning that the factor size (footprint) should be treated with some caution to determinate status, importance or costs (expenditure).

MODELLING THE ORGANISATION OF LABOUR

A labour crew to build a mud-brick tomb consisted of a number of professionals – skilled artisans like architects, masons, carpenters and constructors – complemented with larger numbers of non- or low skilled workers who would be employed in the manual tasks. The works would (probably) have been directed by a small number of overseers (managers), people with experience in managing resources (men and materials). Based on the similarities in design and layout, the skilled professionals belonged most likely to the same group of artisans that

17 Information about dimensions is taken from Tristant (2017: fig. 2, 478–480 for M01 and 468–470 for M07) and Klasens (1961: fig. 1, 110–111 for M25); note that figures from La Loggia (2012: 203–205) are, at some points, slightly different for M01 and M07.

18 To show the effect of a smaller crew (*ca.* 20 men), two schedules are made for the construction of M25. With a smaller labour force the construction would obviously have taken more time, but the tomb could still be finished within a year.

were involved with building the royal tombs at Abydos and elite tombs at other sites. These professionals were most likely employed by the state (Engel 2013: 21).

The length of the construction activities is a practical argument to support the notion that construction was initiated by the owner during life; to have his/her tomb ready before death.[19] This question applies even to the construction of the smallest tombs at hill M (tier C) and, *mutatis mutandis*, also for a significant number of tombs in the Lower Cemeteries. In Early Dynastic Egypt, the mummification practices were not yet developed and a body would have been buried within a matter of days (2–3 days), before natural decomposition would have set in (Powers 2005: 6; Goff 2009: 23).[20]

However, besides being a place to dwell in the afterlife, a tomb was also seen as an instrument to project power, prestige and status during life. When an individual oversees the design and the construction of his/her tomb, it is also possible to manipulate the prestige and status that the tomb expresses after death (Parker Pearson 1999: 84–86). This is a potent argument for persons who belonged to the higher levels of society, people who had the means to act when opportunities presented themselves.[21]

It is generally accepted amongst scholars that the non-skilled labourers were corvée or conscript workers (Helck 1975; Eyre 1987: 18, 24–27; Roth 1991: 208; Cooney 2007: 167), who conducted labour for limited periods of time for the state as a form of taxation in kind. The circumstances of recruitment of the labourers who worked at Abu Rawash remains unknown. However, about the origin of the work crews, Ann Macy Roth made an interesting remark about the possible "local" origin of the pyramid workers in the Fourth Dynasty. Based on the find locations of the names of the work crews (phyles), she considered the option that the construction crews for the pyramids could have originated from state institutions in the wider Memphite area (Roth 1991: 210) and were – on a rotational basis – deployed in the construction of the tomb of the king.

The location of origin of the conscript labourers may have a relation with the size of the levied group. Small numbers of workers can be raised with more ease and flexibility from the direct surroundings of the construction site, to avoid travel time and travel efforts. From a practical and economic viewpoint, the required dynamics of construction of the M-tombs (tab. 4) would have been suited best by a local flexible workforce.

19 During the Old Kingdom, sources suggest that it was customary that sons (heirs) built the tombs for their fathers (Eyre 1987: 24). The question remains whether this was the actual situation or a perceived process of familial courtesy from a son to a father. Obviously, this issue would have been important during the entire history of Ancient Egypt. One of the relevant questions is whether the son built his father's tomb after his death or before, as token of honouring his family?

20 The natural decomposition of the human body follows a more or less predictable pattern. Before "rigor mortis" sets in (after 2–6 hours), the body should have been wrapped in the characteristic contracted posture of the Early Dynastic Period. When no extra mummification measures were applied, it can be assumed that the body was buried within the time-frame of two to three days (Powers 2005; Goff 2009); a practice still in use nowadays in the Middle East.

21 Deborah Vischak (2006: 257)made an interesting observation with regards to Old Kingdom tombs: "Although groups of artisans executed the work in Old Kingdom elite tombs, the form of the tomb and its program related specifically significant ritual and expressive functions to fulfil, and the tomb owner, *as a knowledgeable, informed, and thinking agent, responded to a wide range of influences*, including religious ideas, cultural traditions and elite mores, among others, in the creation of his tomb program." (emphasis added)

The elite buried at cemetery M were – most likely – officials of high status in the administration. They were probably in charge of state institutions in the area and, in that capacity, employed larger numbers of people. Arguable, they had control over the resources and were able to deploy people to different tasks or other jobs (Eyre 1987: 25: "...some degree of independent enterprise"). In other words, they probably had the opportunity, authority and means to deploy workforces at tasks they would seem fit.[22]

It is, therefore, possible to argue that at Abu Rawash a part of the construction forces were indeed levied locally. As argued above, the repeated construction may have led to a local skilled workforce. It seems unlikely that the smaller tier C tombs (tab. 4) were constructed by the central state organisation. They could be built in matter of days/weeks by a small crew with limited skills. If this premise is accepted, it is also possible to propose that the medium tombs – like tombs M10, M11, M13 or M19 (tab. 4, tier B) – could have been built without involvement of central state.

The construction of the larger tomb complexes would have required the skills and expertise of the central state organisation. These tombs could have been built in a form of (in modern terms) a "joint venture" project. The state would provide the expertise to build the "template", the local elite, in their role as local administrators, would have brought in funding, a workforce and the required materials.[23]

Given the social fabric of possible kin groups, the principles of patronage or patrimonialism could be explored in this context (Campagno 2016). It is beyond the scope of this study, but it could be possible that a patron-client relation was instrument in tomb construction practices. Construction of the large tombs of kings, members of the royal family and high officials of the state would probably fall in the category of the "logic of patronage" (Campagno 2016: 9). The owners of the large M-tombs would simultaneously have participated in multiple spheres of patronage. As "clients" to the king and, at the same time, as patrons to lower officials and/or the local community in terms of "logic of kinship" (Campagno 2016: 10–11 and 15–17).

As argued by Campagno (2016: 10), the social organisation of early Egypt would have been much more complicated than a general concept of dominancy of the king, the "logic of the state".

OBSERVATIONS

The aforementioned information can be summarised in five observations. These observations are then used in the next section to explore an alternative explanation for the development of the status cemetery M at Abu Rawash, and, by extension, to situations in comparable cemeteries.

22 Contemporary sources are obviously not available, but also evidence from the Old Kingdom era does not clarify this issue. Christopher Eyre (1987: 22–24) argues for a substantial role for royal involvement, expressing the value of the formula *ḥtp dj nsw* ("a boon which the king gives") especially during the earlier Old Kingdom. Violaine Chauvet (2007: 314, 321) argues against this idea based on an elaborate study of a more substantial part of the available textual evidence from the later Old Kingdom. Although from a very different time in the history of ancient Egypt, this debate shows that the actual royal involvement was different and probably less decisive than decorum, as presented in Old Kingdom biographies, prescribed.

23 Compare Vischak (2006: 257): "...the tomb owners would have been in contact with the workshop creating theirs and other programs". Again, this situation regards the Old Kingdom, but could *mutatis mutandis* apply to the situation in the First Dynasty.

1: Multiple mortuary practices that occurred side by side over a longer period of time.
There are basically three types of substructures present at Abu Rawash, which suggests that three variations (traditions) of mortuary practices existed in the community.

Each tradition can be associated with a different view on the requirements for existence in the afterlife. The background of these variations, or their actual meaning, remains unknown. There is insufficient information to elaborate, but it can be speculated that the differences in design traditions could relate to different origins of the adherents of these traditions, *i.e.* family, kin groups or descend groups (Savage 1997: 228). However, the evidence from Abu Rawash does not support the notion of competition, nor does it supports or negates the idea about migration.

The precise dates of the tombs at cemetery M show that people of status, with a background of two different mortuary practices, were buried at the same time, as evidenced by the five tombs with inscriptions of King Den (tab. 3). A comparable co-existence can be found in the four cemeteries in the lower desert (tab. 2); the three distinct variations in design occurred over a long(er) period, from Naqada IIIB till Naqada IIID, but showed no significant development during this period.

2: The mortuary practices were shared between several social levels.
The three types of mortuary practices were found in tombs in all cemeteries. The tombs in cemetery M are larger and more lavishly furbished than the tombs in the Lower Cemeteries, but important construction features were shared; like the closure of the burial niche, the deep straight shaft without further treatment of the walls, the extra space for the storage of grave goods, and – in some cases – the ledge in the shaft. The use of natural stones is also shared, but in the larger status tombs the stones were dressed and made to fit while in the smaller tombs the stones were hardly cut to size or shape. This evidence suggests that multiple strata in the local community shared identical mortuary practices.

The inscribed grave goods found in several tombs at cemetery M show that groups involved with the two distinct mortuary practices had direct relations with the royal court and the highest levels of the state's bureaucracy. Although not attested by direct evidence, the same is probably true for the other larger tombs at hill M, as they shared the same specific architecture of sub- and superstructures. There is no markedly difference in the material culture (grave goods) in the tombs with the different designs of their substructure. It seems that the groups with different mortuary practices shared the same material culture.

The "lateral niche" tombs are not unique for Abu Rawash, but the distinctive design of the large "lateral niche" substructure in elite tombs is only evidenced at Abu Rawash and in mastaba S3035 at Saqqara North (Emery 1938: esp. pls. 1 and 2). The resemblance of the design of the substructure suggests a social relation between the owner of S3035 and owners of the large tombs of the "lateral niche" type III-A at hill M.

3: The social fabric of status cemetery M shows a grouped constellation of tombs, with an internal stratified social order.
The tombs at cemetery M are grouped in distinctive clusters. The clusters west and south each consist of tombs with one type of substructure; the core cluster shows a mix of types. Each cluster contains tombs of varying dimensions, attesting to a stratified elite society. The smaller

tombs at hill M are larger than the big tombs in the Lower Cemeteries. Access to the status cemetery M was apparently restricted, but the social background of the different mortuary practices was evidently not a criterion.

Cemetery M can be described as a communal cemetery, like the cemeteries at Naqada, Tarkhan, Giza and Abu Ghurab. Abu Rawash stands out by the sheer number of status tombs and the recognisable clustering of the tombs along lines of burial practices.

That pattern of social relations is missing at Saqqara North. The main social relation at that cemetery during the First Dynasty is the one between the owner of the main tomb and its subsidiary burials.

4: The duration of construction suggests that tombs were built in advance, prior to the death of the owners.

The expenditure estimates present a reliable quantification of the efforts and time it would have cost to build the tomb complexes. The modelling of the variations in the workforce shows that even with a sizable number of labourers construction would have taken more than half a year. Even the smaller tombs, like M05, M08 or M20–M24, required weeks to build (tab. 4). As mummification practices were not yet available, this leads to the important observation that construction was – in all probability – started in advance and – most likely – by or on behalf of the future owner of the tomb. The over-dimension of the number of subsidiary in tomb M12 also attests to a longer period between design and actual use.

This premise means that the owner himself made decisions about the design and layout of the tomb, about his abode for his/her eternal life after his/her death. This may explain the individuality of the tombs and the variety in design. The tombs at cemetery M show as much variety and individuality – even within the constraints of apparent templates for design of substructure and superstructure – as the elite tombs at Saqqara North and Giza.

Construction in advance can have consequences for the funeral practices. In a situation of multiple burials in a tomb complex, there can be a substantial delay between the burials (Miniaci 2018: 291–292). A clear case for the idea of temporality of multiple burials may be the subsidiary tombs. It cannot be excluded that the people buried in the subsidiary tombs died before the death of the owner of the main tomb.

5: The estimates of the expenditure of construction allows for a re-evaluation of the organisation of labour.

The required skill set for the construction of the larger tombs at Abu Rawash was probably not much different than at other sites. In addition to basic brick construction, additional skills like digging large volumes in rock and hard gravel and handling and dressing large natural rocks (for the portcullis stones) were also needed.

The skilled constructors of the large and complex tombs were most probably employed by the central state; manual tasks were performed by unskilled conscript labourers. With the local social interaction between elite and the general population at Abu Rawash in mind, a re-evaluation of the labour organisation seems appropriate. Patron-client relationships could have occurred simultaneously at multiple levels within the community that lived in the vicinity of the cemetery fields now known as Abu Rawash. This idea allows the premise that the unskilled labourers were likely recruited locally and – probably – from the social or

kin group. Training of skills and transfer of knowledge would probably have been one of the consequences of the systems of patronage.

The skill set to build the smaller tombs at hill M and the medium sized tombs in the Lower Cemeteries was quite basic. Arguable, these skills could be gained while working at the larger tombs at the cemetery. Such considerations could be interesting in the discussion about the organisation of construction of the status tombs, and, subsequently, for the tombs in the Lower Cemeteries.[24]

DISCUSSION

Recently Josep Cervello-Autuori (2017) argued for a "royal program" to explain the construction of the elite tombs during the First Dynasty. In his study of multiple elite tombs at Saqqara North, Giza, Tarkhan, Abu Rawash and Abu Ghurab (Cervello-Autuori 2017: tab. 1, 220), he explains the character of these tombs as "ritual artefacts" (Cervello-Autuori 2017: 213) and as "royal". He focuses on the royal motifs that can be recognised in the structures, like the niched palace façade, the subsidiary burials, the bull horns found at some of the structures (S3504, S3505, and S3507), the cult statues (S3505), the chapel (S3505) or the stepped structure inside S3038. He argues that the large mastabas at Saqqara North can be seen as cenotaphs for the kings (Cervello-Autuori 2017: 224) and that the other large tombs are part of an architectural program, undertaken by Kings Djet and Den, to establish a net of "royal marks" in the Memphite landscape to affirm royal presence and power (Cervello-Autuori 2017: 225). The dislocated tombs, as "replicas", would have belonged to members of the "royal clan" rather than to officials (Cervello-Autuori 2017: 225, citing Stadelmann 1985: 370). The similarity in appearance (especially the niched façade) is mentioned as argument for an organised program; the duration of the program (reigns of Djet and Den) attest the purpose of making a mark (Cervello-Autuori 2017: 227).

The study appears to focus on a selection of tombs, mainly from Saqqara North and Abu Rawash, and a selection of characteristics of the tomb superstructure that are assigned an exclusive royal prerogative. By assigning all characteristic elements of the architecture of the First Dynasty elite tombs a royal prerogative, possible alternative concepts are excluded by default (Hendrickx 2008: 66–68). All aspects of the tombs and of the cemeteries are made subordinate to the ideology of kingship, as the (apparent singular) driving force of the new state. The variations in design of the tombs are not explained other than "royal"; the distinctive characters of the cemeteries are hardly addressed.

In the proposed "state program", it is only "the king" who had the initiative and secured "his" program. I think this premise can be questioned on several grounds.[25] The first issue is that it was in the reign of King Den that variation, innovation, creativity and change, especially in the design of the tombs, came about in Saqqara and Abu Rawash (Lacher-Raschdorff 2014: 213; Ormeling 2021: 626). It is this archaeological evidence that suggests that more than one singular "driving force" was active. A singular "state program" does not explain the many

24 The organisation of labour in the construction of tombs in all social strata of Early Dynastic Egypt is the subject of the author's Ph.D. research.

25 See also Lesley Warden (2015: 470): "…traditional bias towards 'big man' history…".

variations and it subordinates all accomplishments of the wider society, including those of the officials of the administration of the state, to the one king. That variability should not be treated as "noise", but should "...be approached as the situated construction of difference" (Hodder 2000: 26).

Secondly, the purpose of the tombs and the remarkable variety in design of the substructures are not taken into account. Besides being a "ritual artefact", the function of each tomb was that of a dwelling to cater for the eternal afterlife of the deceased. As outlined above, it is the design of the substructure that expresses the ideas and beliefs of the owner about his/her continued existence in the afterlife. Tombs were designed based on a conscious choice of the owner, it can be postulated that each design expresses the personal and communal identity of the owner (see footnote 21). The archaeological records at Abu Rawash show at least two different communal identities that occurred side by side in place and time and over multiple social levels of the community. The records of the tombs at Saqqara North, especially those from the reign of Den onwards, attest to a variety in design and they also indicate a range of underlying preferences and different choices.

Thirdly, the arguments to see a niched palace façade and the subsidiary tombs as exclusive "royal clan" features are not convincing; besides, what constituted the "royal clan" in Early Dynastic Egypt? The concept of establishing a "royal mark" at Abu Rawash is not supported by the actual evidence. Why would the king build so many tombs, in multiple clusters, to make his mark at this location? It is, therefore, difficult to reconcile each tomb with the king.

In an earlier study, Ellen Morris (2007a) made a strong case that the officials whose names were found in the elite tombs at Saqqara North were most likely the persons responsible for equipping the tombs and not the owners (Morris 2007a: 187; Kahl 2001: 184). She further argued that some tombs may have belonged to queens and that the others may have been built for male relatives of the kings. These latter tombs remained name-less to underscore the power and glory of the king, they were not intended to function as tributes to their individual owners (Morris 2007a: 188).

The argument that a name of an official and/or an institution primarily marks the location of production or packing of the associated (mobile) goods is strong and valid. It explains why some names were found in multiple tombs and why in other tombs more than one name was found (Morris 2007a: 179–184). The tags with names of officials cannot longer be used as evidence to assign a specific tomb "one on one" to an official. That does not mean that these officials could not have been the owner of one of these tombs. With their names directly next to the name of the king on labels or sealings, it is clear that they belonged to the highest levels of the administration. With that status and in that capacity, they were most likely eligible to certain preferences, like building a large tomb that was provisioned, by royal command, by institutions that were overseen by themselves and others. To connect a tomb with one person, additional evidence and more personal attestations are necessary.[26]

26 Like the wand found in the burial chamber of S3504, with the name of King Djet and official Sekhemka inscribed (Emery 1954: 104). Morris (2007a: 178) compares this artefact with the tags and labels, she sees them (all) as "...one typical genre...". In my opinion, artefacts of this kind can be used to debate ownership of tombs. The wand, probably a gift from the king to a named official (Sekhemka), would be an item of status that someone would want to take in his grave. Could it be reasonable to argue that someone else would have that object in his or her tomb?

The assumption that most of the other tombs belonged to members of the royal clan is, according to Morris (2007a: 175), based on the idea that the wealth of these well-equipped tombs could only be royal and would therefore have belonged to family members of the king. The evidence to support this assumption remains unclear. Morris (2007a: 187) rejects the idea that the Saqqara tombs could have been northern cenotaphs of the kings, mainly because of the reported human remains found in the tombs.[27]

Although she attested the primary purpose of the structures, tombs for deceased members of the royal family, Morris fails to address the differences in design of the tombs at Saqqara and other elite cemeteries. Her approach and explanation are also "top down"; again all initiatives are reserved for the king.

In recent years, a variety of aspects of the Early Dynastic society has been studied. The research shows an already vibrant and dynamic society within a functioning state that consisted of multiple social layers in relation with each other and with the state itself. In combination, these studies provide a wider base to explore the First Dynasty elite tombs than just a royal connotation. With the results of these studies in mind, I would like to propose an alternative hypothesis for the development of cemetery M.

A hypothesis, based on social and economic developments during the First Dynasty, that, in my opinion, fits more comfortable with the available archaeological records of a stratified community that shared more than one social identity at multiple levels. Developments are in most situations driven by people, who act as agents and initiate, stimulate and steer changes in the existing social structures.

Research at Tell el-Farkha (*e.g.* Cialowicz 2008; Debowska-Ludwin 2008; Jucha 2016) shows comparable social interrelations, while the large Early Dynastic cemeteries found at other locations – *e.g.* Helwan (Köhler 2004, 2008a and 2017 [on society]; Köhler *et al.* 2014 and 2017 [on cemetery records]), Abu Ghurab (Bonnet 1928; Radwan 2000) and Naga ed-Der (Reisner 1908; Mace 1909) – show the extend of the population in that era in other parts of the country. Tantalizing are studies about the role and position of – for instance – women in Early Dynastic Egypt. As Susan Kelly (2019) shows, there was more than meets the eye (also Savage 1999). Also interesting are studies of the social organisation of early Egypt (Campagno 2016). Early Dynastic Egyptian society was complex and much more than the king and his inner circle.

The proposed explanation rests on the assumption[28] that the economy was one of the primary concerns of the new state: "…for without adequate command of Egypt's economic resources, the state simply could not function" (Wilkinson 1999: 113).

In response, new landholdings (estates and domains, Wilkinson 1999: 123) were established by the state, to provide sufficient surplus to sustain the state and its growing institutions (Wilkinson 1999: 117). These new landholdings have been attested as early as the reign of Djer (Engel 2013: 37) but surely during the reign of Den (Wilkinson 1999: 123). To control the

27 To whom belonged those human bones? At the time of excavations, the surface of the large mastabas at Saqqara North was riddled with intrusive burials dating to almost every later period. It is my opinion that, given the methodology of excavation and reporting, especially with regard to the effects of multiple later disturbances and/or post-depositional processes, such evidence should be used with utmost caution (Ormeling 2017: 12; Ormeling 2021: 623–624, fig. 6).

28 Caution is required; the available sources – tags and labels associated with grave goods – show a strong bias to aspects of the economy as they left the most traces (Engel 2013: 19, 36).

resources from these estates and domains, either for food production or of a more industrial nature, administrators were appointed. These administrators were chosen from the ranks of the elite of the state. The primary aim of these landholdings was to provide for the king and his court during life, but also to construct and maintain the mortuary installations for the king and his inner circle (Wilkinson 1999: 110; Müller 2012: 29). The creation of these domains and estates is confirmed by tags, labels and seal impressions that included the names of the kings. The appointment of the managers/controllers led to an increase of the ranks of the state's administration, a development that is attested by the increase of the numbers of different kind of seals during the reigns of Djer, Djet and Den (Müller 2012: 19). The expansion of the numbers of influential officials, prone to make their mark, was most likely an important factor in the drive for change and innovations.

It is this expansion of the bureaucracy that can, in my opinion, be correlated with the erection of the elite cemetery at Abu Rawash (and sites like Tarkhan,[29] Giza and Abu Ghurab). The expanding administration would be centred in or around the capital Memphis and would probably also have led to a growth of the general population in that area.[30] The area around Abu Rawash[31] would have been a suitable choice to expand food producing landholdings to feed the capital. Direct and indisputable evidence for this premise is not available, but agricultural produce was the basic economic foundation in early Egypt (see below on granaries).

The extraordinary number of tombs, constructed in a clear pattern, shows that a strict and exclusive royal initiative was unlikely at Abu Rawash and that more than one social group took part in the social activity in that area; in life and in death by building their tombs. The number of tombs with the distinct design of the "lateral niche" substructure side by side with a more traditional brick-lined design, built in succession as the layout of the cemetery attest, belonged to two or three different kin groups that made their mark on the landscape. The "template" for the design of the visible superstructure and the ramifications of the elite tombs showed that they represented (the central role of) the state. Besides the differences in dimensions, the elite tombs at Abu Rawash looked very similar to those at Saqqara North and other elite cemeteries.

For the local community the cemetery would probably have presented in the first place the eternal resting place of their ancestors, a sacred landscape for people of status of their kin. The relation with the new state would probably have come in the second place, and would have confirmed the status of the local group. Cervello-Autuori (2017: 213–214) argues for the "mythical and ritual" aspects of funerary monuments, but it remains unclear why this can only be seen as exclusively royal?

29 Wolfram Grajetzki (2008: 111) assigned the larger palace façade tombs to the local governors of the area.

30 Maybe also in other parts of the country with similar consequences, but these developments are beyond the scope of this study.

31 At Kafr Ghattati, *ca.* 6 km south of Abu Rawash, a small cemetery developed during the first part of the First Dynasty (Engles 1990); based on the dimensions of the substructures – no remains of superstructures were found – the tombs probably belonged to the middle classes. The layout of the tombs suggests a small cemetery of associated burials (Engles 1990: fig. 28). The development of this cemetery could also be explained with the proposed concept of growth and decline of the (middle) elite during the middle of the First Dynasty.

The status and prestige, and maybe also the wealth, of one of the kin groups were such that one member of that group was eligible to build his or her tomb complex at the higher tier cemetery Saqqara North: S3035.

The inscriptions confirmed that the king and the state's institutions were involved in the provisioning of the tombs. This neither negates nor confirms that the owners were part of the royal household or clan. In itself, the question whether high officials were members of the royal family or not may be interesting (pro: Helck 1987: 218; Wilkinson 1999: 86; contra: Baud 2002: 179; Strudwick 1985: 300). However, understanding issues of the individuality in design and freedom in the execution of the tombs, either at Abu Rawash or at other elite cemeteries, may be more important.

Were the holders of official functions in the administration of the early state free to explore the means at their disposal to build their tombs as they saw fit? Obviously, there were constraints, like "the templates" for the superstructures or the similarity in design in line with the mortuary practices of their kin. However, it can be argued that the state's officials kept sufficient independency from the central state. In my opinion, this observation may be one of the most important indicators of the early Egyptian state.

Besides the formal structures within the administration of the state, simultaneously there would have existed less formal concepts like patronage or even patrimonialism in the government, bonds along lines of kinship and family (Campagno 2016). The concept of patronage is related with a certain freedom of acting by state officials; they would have been able to relocate resources to their free will, most likely to their own advantage.

This negates the assumption that it was only the king who controlled, from the top down, the functioning of the state and the resources. The ideology of the new state did express this concept; but in reality the situation was probably less strict and more complex.

However, the state had to maintain some form of control. The formal power to limit the number and possible levels of functions remained one of the tools of the state. The number of functions in the administration decreased during the reign of Adjib (Naqada IIIC2, Müller 2012: 19), probably a sign of tighter control. This may explain the developments at Saqqara North and at Abu Rawash. At Saqqara North less tombs were built, mostly smaller and less lavishly furbished but still showing variety in design (Ormeling 2021: 627–629, fig. 8). At Abu Rawash cemetery M was no longer used, but in the low desert medium sized tombs were built in cemeteries 000 and 800 (Ormeling, *forthcoming*). The cause may very well have been a restriction in the command of resources by the officials of the administration.

IN CONCLUSION

At Abu Rawash, the archaeological records of the mortuary remains of different kin groups show the interrelations of multiple social levels in First Dynasty Egyptian society. These records attest the differentiation within the population, which was reflected within the administration of the state in the middle of the First Dynasty. This observation opens the way to explore alternative explanations for the development of the elite tombs from a local perspective, like one from the socio-economic perspective argued above. The tombs at cemetery M were built by and for officials who had roots in the local community; they belonged, in all probability, to different kin groups.

In my opinion, the alternative approach does greater justice to the accomplishments of the early Egyptian society and explains the distinct characteristics of both the elite tombs and the elite cemeteries in a more comprehensive way. It enlightens our understanding of the social relations at this site; it also shows that the king was not the only agent of change in the First Dynasty. The concept of patronage (Campagno 2016) deserves to be explored further as integral part of the early economic system. The overall control by the royal court (state) remained, it intervened occasionally to maintain an economic equilibrium and set limits to curb the administration as attested by the reduction in seals (Müller 2012: 19, 30).

It would be interesting to explore developments in the economy and conspicuous mortuary practices during the latter part of the First Dynasty at other sites (Engel 2013: 36). Most of the discussion is still limited to sites in the direct environment of the capital Memphis, while systems of patronage probably existed at other places as well.

Based on the premise that the elite tombs in the First Dynasty were designed and built for individuals, whether of royal lineage or not, it is possible to re-assess the extra-ordinary features found within the walls of each tomb complex in their own value.

In the words of David Wengrow (2006: 244), negating the royal prerogative: "The mastaba tomb complex was, in short, a model estate for the dead, encompassing… many of the functions of a living estate that was… a source of life for its dependants." The tomb complex served not only the owner (of the estate), but also his kin, dependants and subordinates (Wengrow 2006: 244).

The first consideration is then the likely extend of the tomb complexes. When one considers the fragmented evidence from a number of tombs, it can be deduced that the larger elite tombs at Saqqara North, Abu Rawash and maybe other sides were all equipped with extensive attributes that were integral part of the tomb complexes (see footnotes 12 and 13 above).

A second consideration regards their meaning. The variations in the attributes employed in the different tombs points to individual decisions, and – maybe – to different mortuary practices (or beliefs). The absence of funerary boats in the western cluster at cemetery M – discussed above – may point to such a distinction.

Two features that occurred at more than one site may serve as an example for a non-royal interpretation of the meaning of attributes of large tombs.

It can be argued that granaries (storage containers for cereals) and bovid heads (representations of cattle) were important aspects of economic life in early Egypt. Large estates to produce food surpluses to provide sustenance for the court, mortuary complexes and institutions were part of developments during the First Dynasty (see above).

The common way to store food supplies for the deceased was the use of pottery vessels; these were found in almost every tomb. It can be argued that granaries held a different meaning.

At Abu Rawash, several tombs had granaries as grave goods or as part of their construction. Tomb M12 had four large granaries on the bench in the burial pit (Montet 1938: pl. XI-2; Tristant 2016: 161), burials 341, 343 and 890 in the Lower Cemeteries had smaller sized granary vessels (Klasens 1958b: 36–39, fig. 13; Klasens 1959: 73–75, fig. 16).

If we accept storage vessels as a provision for the individual owner, the granaries could have been an expression of the owner's profession in life, to provide for the wider community.[32]

32 Contra: Pjotr Kolodziejczyk (2009: 52) considers functions like votive goods or toys for the smaller examples (models) found at Tell el-Farkha.

Mastaba S3038 at Saqqara North is well-known for its granaries (Emery 1949: 82–94, esp. 85 and figs. 48 and 50). As argued before (Ormeling 2019: 119–120), this tomb is probably more interesting for its platforms constructed inside the mastaba walls than the often quoted "stepped core" over the burial chamber. It is tempting to correlate the large volumes of the granary bins in the northern annex of the burial chamber with the lower platform as a "docking station" of some sort. The ritual aspect of both platforms is further attested by the (blocked) openings in the northern and southern wall of the mastaba body. It is tempting to see a "model farming estate" where the harvest was brought to the granary bins via the platform, to be subsequently redistributed to the community that was dependent of the owner of the tomb.

Subsequently, when one accepts that the larger granaries were correlated with the profession of the owner during his or her life, it is possible to argue that the bucrania on the benches of mastabas S3504, S3506 and S3507 also indicate the profession of the persons buried in those tombs. The function of the tomb owners could be associated to (large scale) cattle herding. Given the premise that tombs of such size were constructed in advance during the owners life, it seems understandable that the bovid heads[33] were made of (plastered and painted?) clay models (contra: Morris 2007a: 174–175, citing Lehner 1997: 79; Cervello-Autuori 2017: 221–222).

In my opinion, it seems likely that bucrania, arranged in a pattern and as an element in the construction of the owner's "dwelling of eternity", stood as a symbol for a herd of bovids. Singular bovid bones or skulls, often found in the corridor near the place of offering of the tomb, were probably remnants of offerings;[34] like burials M19 and 467 at Abu Rawash.

Arguable, the design and/or architectural features (the so-called attributes) of the large elite tombs of the First Dynasty can be seen as the precursors of the elaborate wall reliefs that were so common in the mastabas of the Old Kingdom (and later).

APPENDIX: EXPENDITURE OF TOMB M25

Roadmap: The first step is to assemble the information about the construction, with a reconstruction of missing information when needed (figs. 5 and 6). This is followed by an assessment of the essential construction parameters (tab. 5). The last step is to schedule the activities in an appropriate order (chart 2), weighing manpower against required activities.[35]

The design of tomb M25 is different from most other tombs at cemetery M, it is the only larger brick-lined tomb. The expenditure of the construction of this tomb is therefore of importance for an overall understanding of the expenditure at elite cemetery M.

The dimensions of all parts of the substructure are known, they were recorded in detail during the excavations (Klasens Field book 1959 III undated), and they are reconstructed in fig. 5. At the edge of the pit, a ring of mud bricks was found at the surface of excavation, it is

33 The term bovid is preferred over bull; a bull (singular) is often associated with the ideology of the king. One or more bovid heads may very well have stood for cattle, representing either food or wealth.

34 Maybe a comparison is possible with the presentation (icons) of bovids or meat at the Early Dynastic offering stelae (Köhler – Jones 2009: 39, fig. 15).

35 For a more extensive description of the methodology, including examples, see Ormeling (2017: 409–417, Appendix B and tab. 1).

assumed that this represents the surface of construction and indicates that the body of the mastaba was not constructed over the pit.

Unfortunately, the mastaba and enclosure wall were not discovered during the excavations in 1959; although subsidiary burials (M25A) and a boat grave (M25B) were located.

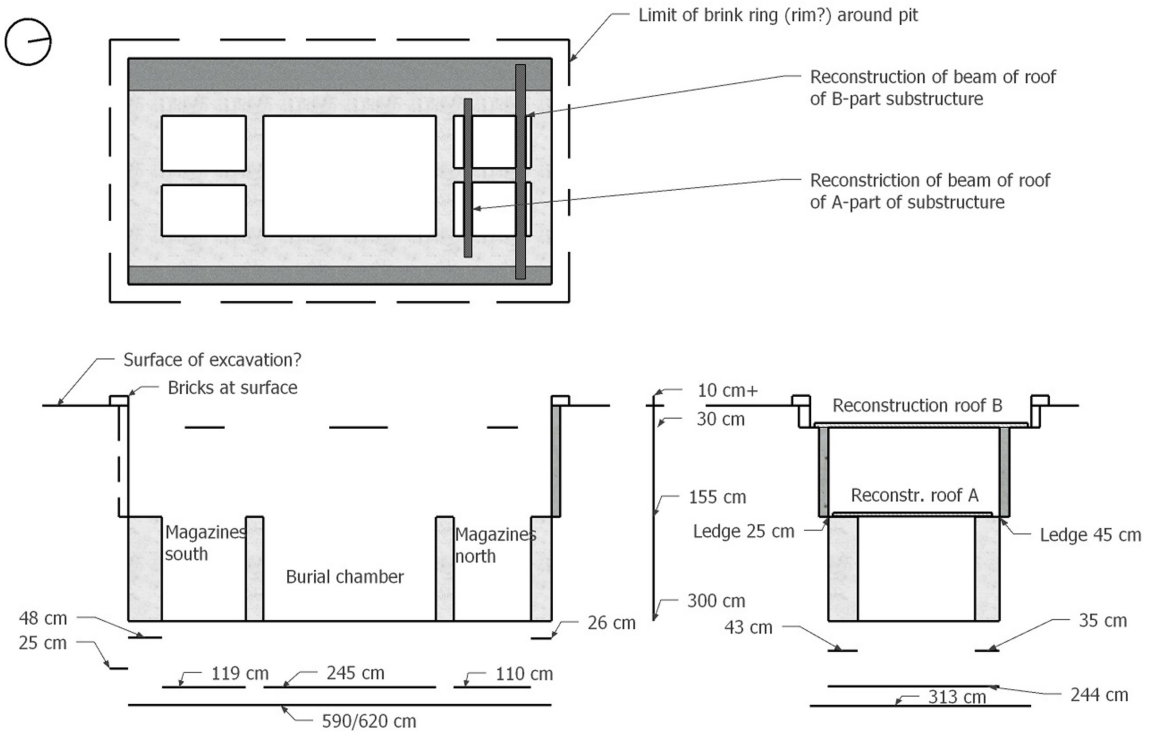

Fig. 5 A drawing of the substructure of tomb M25: top plan and sections (drawing M. Ormeling, based on Klasens' unpublished Field book 1959 III, pages undated)

The location of the boat grave and subsidiary burials provides a demarcation of the enclosure walls and mastaba at the western and southern side (fig. 6). Like tombs M01 and M07, it is assumed that the enclosure wall was built directly against the subsidiary burials. The position of the enclosure wall around the boat grave is not attested by other tombs and the dimensions are based on an interpretation of the author. The width of the wall is set at 75 cm, comparable to tomb M19; the height of the wall is arbitrarily set at 150 cm.

It is assumed that the mastaba consisted of outer walls (width 100 cm), with a filling of sand and rubble; the height is arbitrarily set at 4 meters. In this reconstruction, no storage rooms inside the body of the mastaba are taken into account.

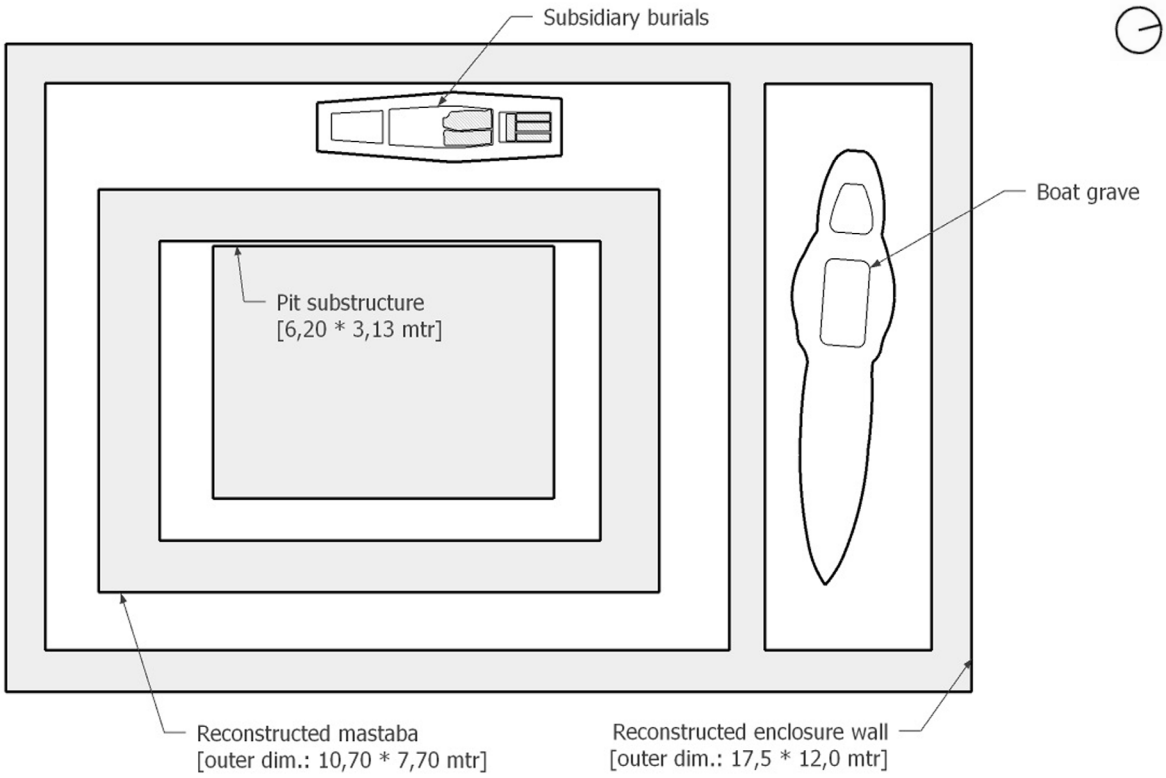

Fig. 6 Reconstructed top plan of the superstructure features of tomb M25 (drawing M. Ormeling, location substructure in relation to boat grave and subsidiary burials is based on Klasens' Field book 1959 III, 19th March)

Construction parameters M25		
Substructure		
Excavated space	55	m^3
Mud brick construction	4 700	bricks
	2	m^3 – mortar
Plaster	2.5	m^2 – inside surface
Wood cover	34.84	m^2 (2 times)
Superstructure		
Mastaba walls	49 750	bricks
	20	m^3 – mortar
Plaster & paint	150	m^2 – outsize surface
Mastaba fill	149	m^3 – sand/rubble
Ramifications		
Enclosure walls	28 500	bricks
	11	m^3 – mortar
Plaster	213	m^2 – outsize surface
Subsidiary tombs	700–1000	bricks (approx.)
	1.5	m^3 – mortar (approx.)
Boat grave	1–1.5	m^3 – mud (approx.)

Tab. 5 Summary of construction parameters of tomb M25 (based on Klasens' Field book 1959 III, pages undated)

CONSTRUCTION PARAMETERS

The premise of the model is that construction is supervised by the owner.

The estimation assumes that work was started with the production of the required number of mud bricks: *ca.* 84.000 (tab. 5); these were likely made in the plain in the vicinity of a mud source and an abundant supply of water. From there the bricks would have been brought up the hill, to the construction site. Concurrent with the transport of the bricks, a group of masons would have begun with the digging of the pit of the main tomb and the subsidiary tombs. Successively, the masons would have started with building the brick walls, at first in the substructure and then the superstructure and the enclosure walls. During the brick laying by the masons, other groups would have been busy with collecting mud and water to produce the mortar; mortar needs to be mixed in smaller quantities, to apply "fresh" mortar for each layer of bricks. It is assumed that then a coating of plaster would have been applied on the walls, to protect them from the effects of the weather. The tomb would be more or less ready to receive its future occupier; it is unknown how much time would have pass between the construction of the tomb and the actual burial.

During the burial, the body (in the coffin) would have been lifted over the walls of the mastaba and then lowered into the burial chamber; all the collected grave goods would have been brought in the tomb and the tomb would have been closed with wooden beams covered with planks and reed mats; traces of which were found during excavations (Klasens Field book 1959 III, undated page). Finally, the mastaba body would have been filled with sand/rubble; at least to some height and maybe till the top of the mastaba walls. Beams, planks and reed mats would have been made in advance; the sand and rubble would have been taken from the site.

Based on the available data, the construction of the tomb, prior to the burial, would have taken about 90 nett working days, by a crew of 40–50 unskilled labourers under supervision of 3–5 skilled architects and constructors (chart 2). The largest number of labourers would have been required at the start of the construction, busy with collecting the raw materials, making bricks and transporting the bricks and other materials up the hill to the construction site. The most important skills for the architect and constructors would have been knowledge and experience with the design and with the organisation of men and materials.

In addition, a group of 5–10 carpenters would have been working at collecting trees and timber and producing the required beams and planks to cover the burial chamber; some of these men would have been needed to close the tomb at the time of burial. The post-burial activities would probably have taken another 10 men for some 10 days.

The aim of the schedule is to provide a frame of activities and times, it is not meant to project a precise and definite planning of how things were done in antiquity. The schedule does not take in account delays, inefficiencies, variations in men or materials or even non-working days. That is not the point of the exercise; the schedule shows a likely flow of activities, with numbers of labourers that could be employed in a sensible manner (example: the size of the pit limits the number of men digging).

The bottom part of the schedule (chart 2) shows the duration if a smaller group of 20–25 labourers was employed. The construction would in that case have taken up double the time (in nett days). A difference in half a meter of height of the mastaba – set at 4 m in the calculations – would have meant two days more or two days less in construction time. We may conclude that

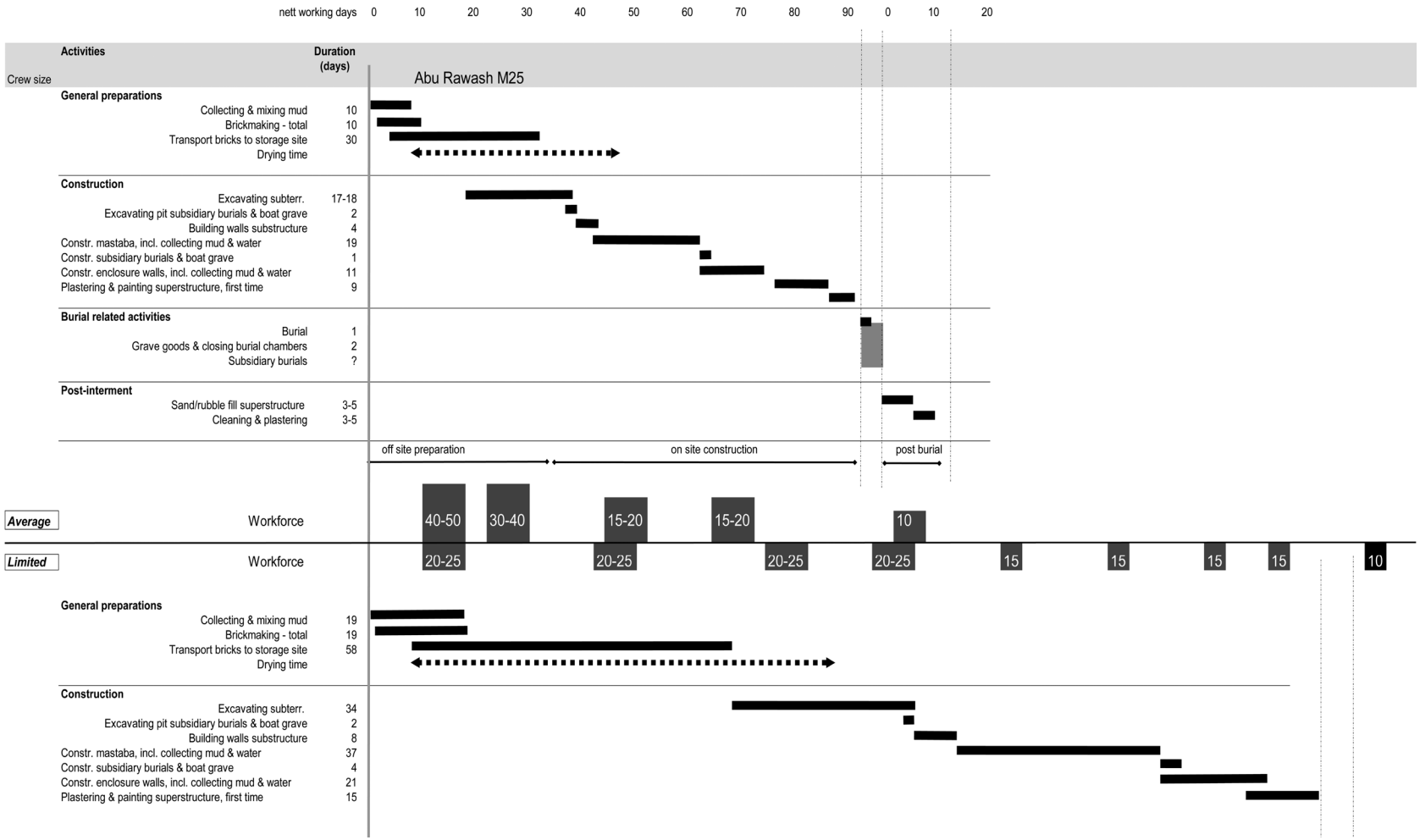

Chart 2 Construction schedule of tomb M25. Upper part represents a reconstruction with a work crew of an average size; the lower part shows the schedule for a construction with a small crew of max. 20–25 labourers

dimensions and available workforce would have mattered, but would probably not have been decisive factors. The observation at the end of the exercise is that tomb M25 could have been built by a workforce of *ca*. 50 labourers under supervision of 5 skilled artisans in a period of 4–6 month, or in a year with a lower number of workmen.

The schedule presents the activities in a constant flow of work, in antiquity that may have been very different. Labour intensive activities as collecting or transporting raw materials or bricks could have been scheduled for specific periods in the year, when labour requirements elsewhere were low; the drying time of bricks may have been of influence of the work flow (Ormeling 2017: 425–426).

The boat grave was probably finished after the burial; the boat would have played an important role in the funerary procession. The construction of the subsidiary tombs would have been part of the original design of the tomb complex and would have been finished in line with the other parts of the complex.

It remains a question at what time the owners of the subsidiary tombs were actually buried.

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Museum of Antiquities, Leiden

1957–1959 Adolf Klasens' unpublished field notes (Field books 1957, 1958 I–II and 1959 I–III; Tomb catalogues 1957, 1958 and 1959; Field diaries 1957 and 1958; photographs from seasons 1957, 1958 and 1959; Album of Antiquities 1957–1959).

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