Functional copper objects and models in funerary context during the Early Dynastic Period

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Abstract

Ever since the discovery of the Predynastic in 1895 by William Matthew Flinders Petrie and James Edward Quibell, great numbers of copper objects have been discovered (fig. 1). However, the study of these objects has been confined to either typological or metallurgical analyses, with seemingly no credence paid to their symbolic aspects (Anfinset 2010; Hassan *et al.* 2015; Kmošek *et al.* 2018; Rademakers *et al.* 2018; Rehren – Pernicka 2014). By combining archaeological and textual data, it is possible today to partly reconstruct the symbolism behind the use of copper objects in funerary context. The aim of this research is to highlight a phenomenon which took place during the transition between the First and the Second Dynasty: the change of the status of copper artefacts found in the tombs. It is possible to see that the size of the objects, and their functionality, changed greatly during this time. Diverse explanations for the phenomenon will be reviewed and a new explanation will be given thanks to a more detailed study of the artefacts and the general context of that time.

Keywords

Early Dynastic – copper – models – symbolism

الأدوات النحاسية العملية والنماذج فى السياق الجنائزى خلال عصر الأسرات المبكرة

باستيان سيغالاس

ملخص

منذ اكتشاف عصر الأسرات المبكرة فى عام 1895 عن طريق ويليام ماثيو فليندرز بيترى وجيمس إدوارد كويبل، تم اكتشاف أعداد كبيرة من الأدوات النحاسية (الشكل 1). ومع ذلك، فقد اقتصرت دراسة هذه الأدوات إما على التحليلات النمطية أو المعدنية، مع عدم وجود أى اهتمام على ما يبدو لجوانبها الرمزية (Anfinset 2010; Hassan *et al.* 2015; Kmošek *et al.* 2018; Rademakers *et al.* 2018; Rehren – Pernicka 2014). ومن خلال الجمع بين البيانات الأثرية والنصية، أصبح من الممكن اليوم إعادة بناء الرمزية الكامنة وراء استخدام الأدوات النحاسية فى السياق الجنائزى. حيث إن الهدف من هذا البحث هو تسليط الضوء على ظاهرة حدثت أثناء الفترة الانتقالية بين الأسرة الأولى والثانية من التاريخ المصرى القديم: تغيير وضع الأدوات النحاسية الموجودة فى المقابر. من الممكن أن نرى أن حجم الأدوات ووظائفها قد تغير إلى حد كبير خلال تلك الفترة. كما ستتم مراجعة التفسيرات المتنوعة للظاهرة وسيتم تقديم تفسير جديد بفضل دراسة أكثر تفصيلاً عن الأدوات والسياق العام فى ذلك الوقت.

الكلمات الدالة

الأسرات المبكرة – النحاس – النماذج – الرمزية

[1] I would like to thank Matt George, Macquarie University, Sydney, for proofreading the present text, and Martin Odler, Charles University, Prague, for bringing some articles to my attention.

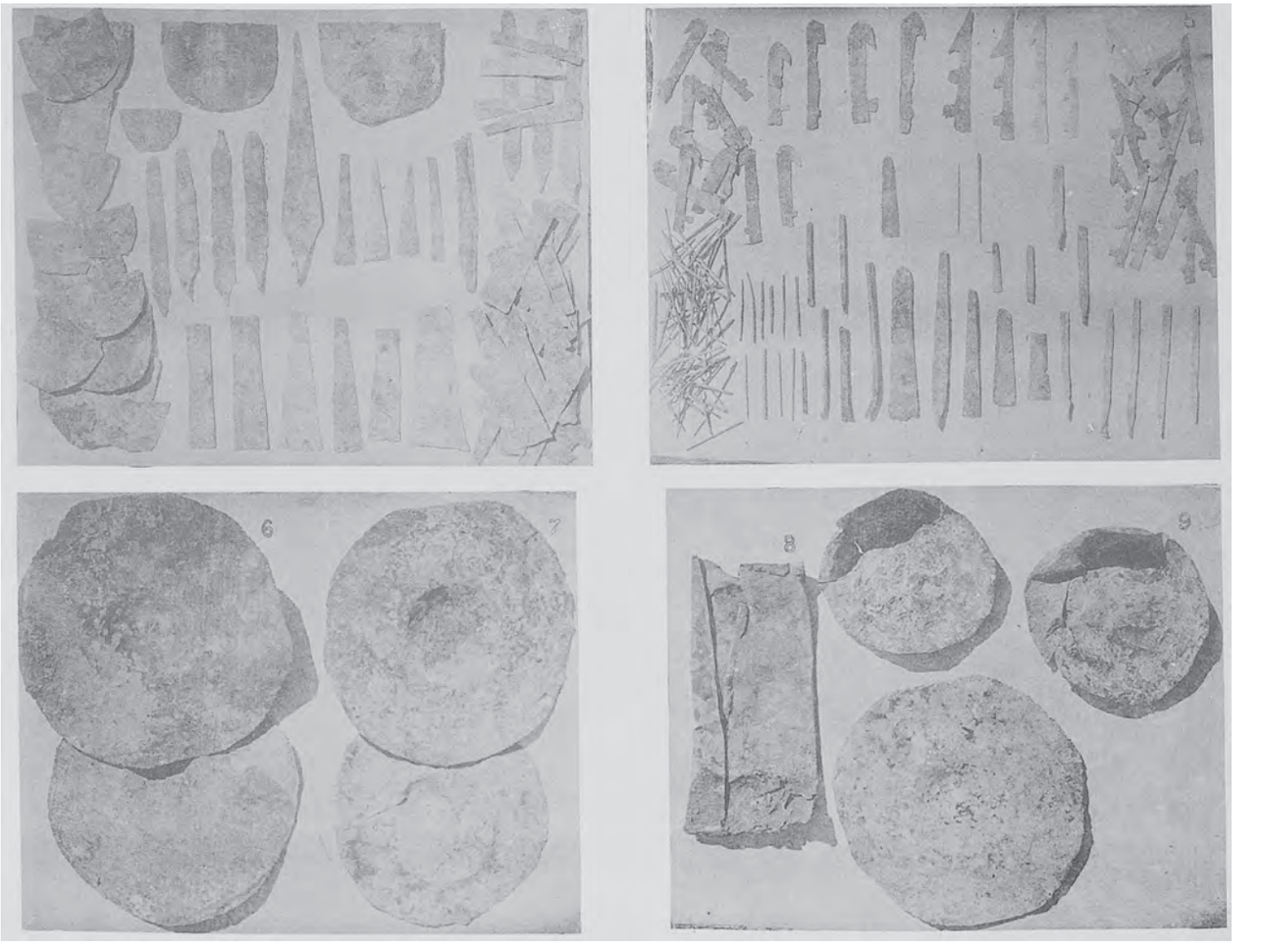


Fig. 1 Example of copper objects found by Petrie in the tomb of King Khasekhemwy at Umm el-Qaab (after Petrie 1901b: pl. IXA)

Working on the copper objects from the Predynastic and the Early Dynastic (fig. 2)[2] can be a difficult task, given the standards of the archaeological records of the time of their discovery.[3] Often, the dimensions are not given and only few illustrations are published. Adding to the difficulty of the work is the partage system, lasting until 1980, which makes it harder to trace back the objects from around the world to their original sources. In some cases, the discoveries were not even published. However, by compiling the data acquired by examining the catalogues and databases of various museums around the world with the original reports they were published in, it has been possible for the author of the present article to make a database of 2209 objects ranging from the Badarian period until the end of the Second Dynasty.[4] Another difficulty to add to this work is the apparent absence of textual material providing a better understanding of how these objects were used, primarily in a funerary context. Nonetheless, using later sources, it is possible to glean an understanding of the symbolic meanings of copper objects from the Early Dynastic Period.

Copper occurrences in the predynastic and early dynastic periods

Since the discovery of the Predynastic in 1895 by William Matthew Flinders Petrie and James Edward Quibell in Naqada and Ballas (Petrie – Quibell 1896), a certain amount of copper objects have been discovered and are still being unearthed from the various sites dating from the Badarian to the end of the Second Dynasty. For different reasons, it is possible to observe a certain gap concerning the amounts of objects found between the most remote epochs and the end of the Early Dynastic. The most evident reason for this disproportion is the preservation conditions: copper is a metal highly

[2] It is here understood as Predynastic the time lapse between the Badarian and the end of Naqada II, and Early Dynastic as the time lapse between Dynasty 0 and the Second Dynasty.

[3] Most of the material was found before the 1960s and was in most instances published according to the standards of that time.

[4] This work is still in progress and it is expected that with time more objects will complete the database.

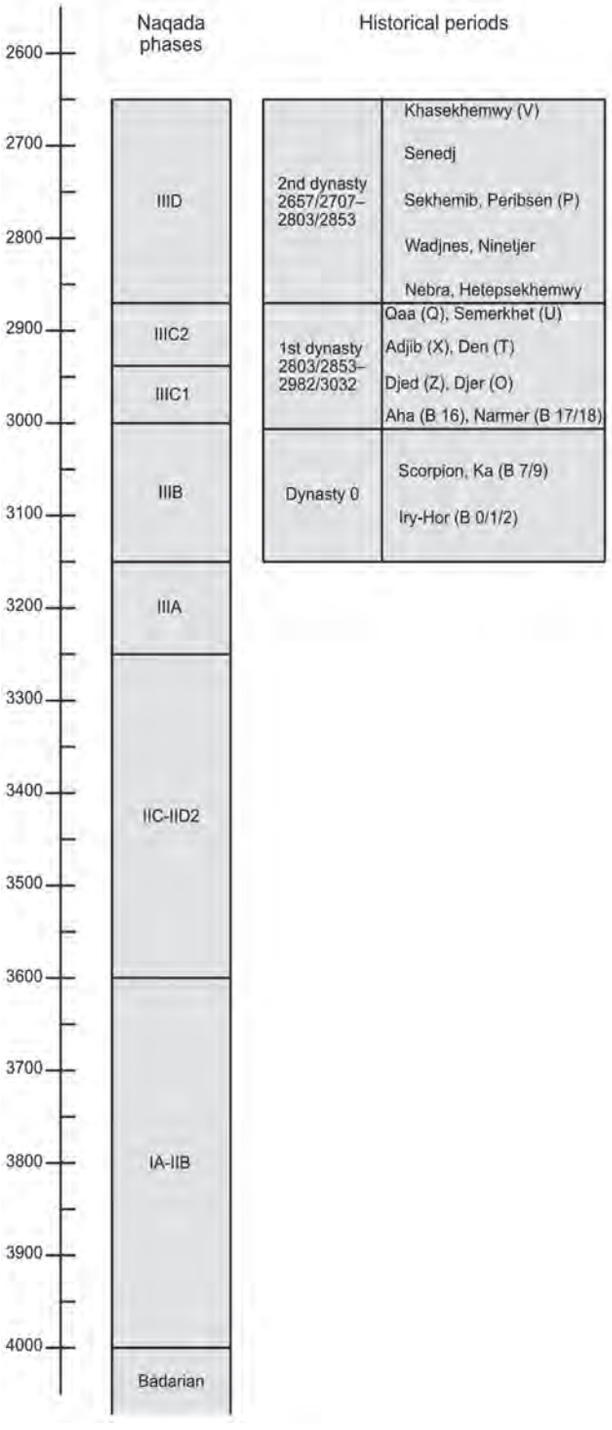


Fig. 2 Chronological framework (after Hendrickx 2006; Wilkinson 1999: 27)

Badarian	9
Naqada I	11
Naqada I/II	6
Naqada I/IIC	1
Naqada II	22
Naqada II/III	1
Naqada IIA-B	6
Naqada IIA-B/C	1
Naqada IIC	3
Naqada IID	24
Naqada IID/IIIA	1
Naqada III	13
Naqada IIIA	1
Naqada IIIA/B	3
Naqada IIIB	30
Naqada IIIB/C	14
Naqada IIIC	12
Naqada IIIC/D	1336
Naqada IIID	14
Second Dynasty	363
Cultures of Lower Egypt	48
'Predynastic Period'	47
'Protodynastic Period'	46
Before the Third Dynasty	103
To determine	94
Total	2209

Tab. 1 Occurrences of copper objects by period

Naqada IIIB/C	14
Naqada IIIC	12
Naqada IIIC/D	1336
Naqada IIID	14
Second Dynasty	363
"Protodynastic Period"	46
Total	1785

Tab. 2 Occurrences of copper objects during the reigns of the First and Second Dynasties

oxidable and with time only leaves a remaining greenish stain on the surrounding area where it would have been located. Unfortunately, early archaeologists failed to mention systematically such features in their reports. The second reason relates to the status of the metal itself. Copper was seen as a prestige item during this period – but not exclusively reserved to a certain social class – with it being imported from areas such as Feinan in Jordan (Pernicka – Hauptmann 1989 in the case of Maadi) and the Sinai Peninsula (Abdel-Motelib *et al.* 2012; Pfeiffer 2013a and 2013b) or even the Eastern Desert (Rademakers *et al.* 2018).[5] The value and prestige of this material led to it being reused, recycled or recast in later periods, or recovered from

[5] For a synthesis on the importance of sharing the data and a first attempt at determining the possible copper sources, see Ben-Yosef (2018).

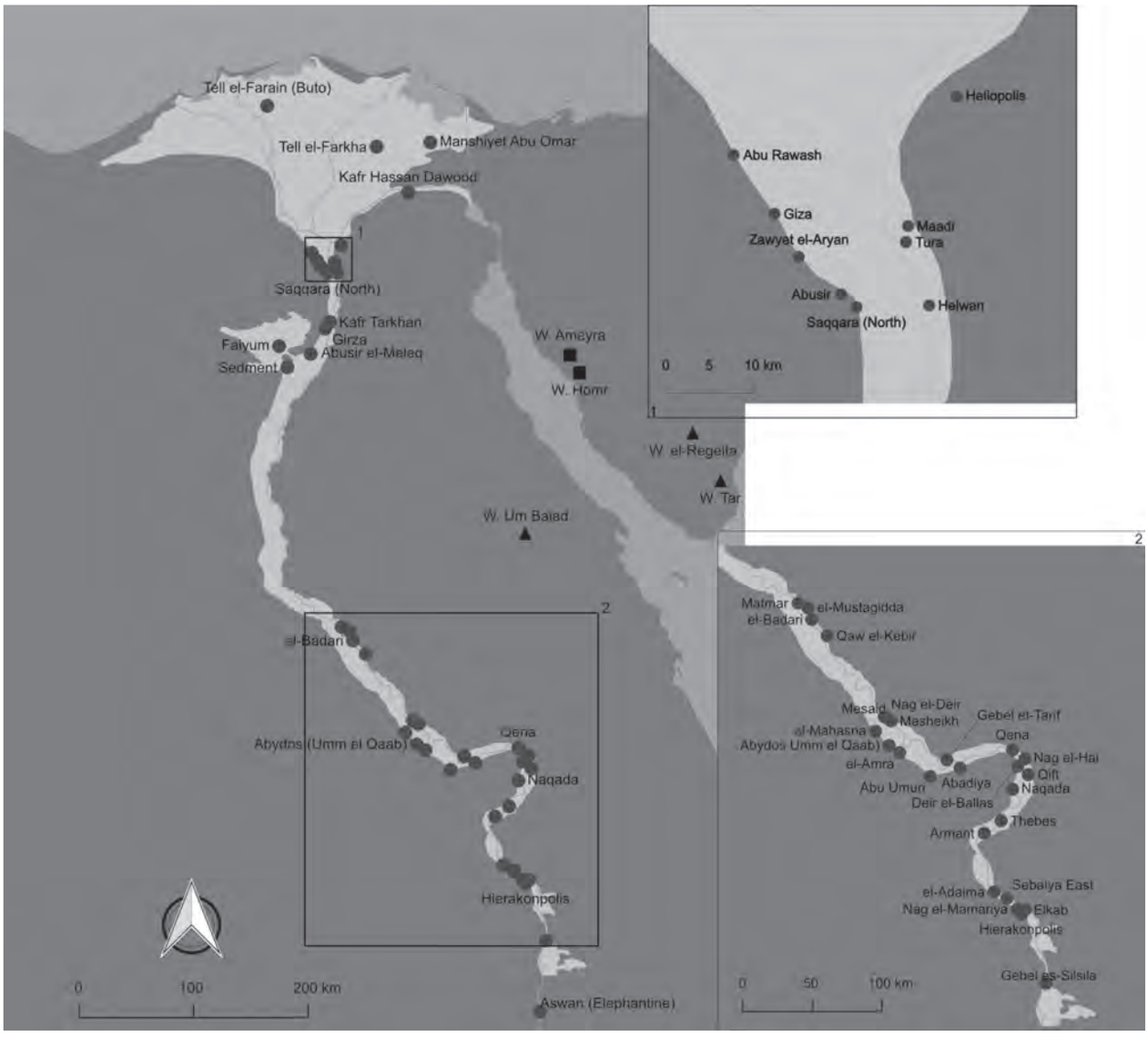


Fig. 3 Map of Egypt showing the sites where copper objects were found for the Predynastic and Early Dynastic Periods (circles), sites with rock inscriptions (squares) and possible mines (triangles) (drawing B. Ségalas)

the sacking of the tombs. That is why the results of the present study depend on the findings made during the excavations and only give us a partial view of a bigger picture: these results are meant to evolve with time because new objects are found or because they finally can be given a provenance. That is why the present study is a snapshot of the current state of advancement of the investigation into the domain of copper objects.

Despite the aforementioned issues relating to the copper objects, it is possible to gain an understanding regarding their discovery and the implications that this has. This is done by gathering each occurrence of a published object, then cross-referencing it with the museum databases worldwide. The first piece of data stemming from this study relates to the number of sites where copper objects were found. As of today, 45 sites are concerned, ranging from the Badarian period to the end of the Second Dynasty, to which some unprovenanced objects are to be added (fig. 3). The number of objects in each site ranges between 1 (*e.g.* Nag el-Hai) and 884 (*e.g.* North Saqqara). Concerning the chronological distribution (tab. 1), it is no surprise to see that the number of objects found fluctuates greatly throughout the Pre- and Early Dynastic periods. For the Badarian period, a minimal number of objects have been found,[6] only for this number to increase greatly during Naqada I and II. Whilst we notice a slight decrease in objects during Dynasty 0, the First Dynasty offers a significant increase in copper objects. Finally, the Second Dynasty sees another drop in attestations. Even though there is this disparity between the amounts of objects attested between the First and Second Dynasties (tab. 2), the

[6] One of the reasons why few objects have been found for the Badarian period is that few sites dating to this period have been excavated (Math 2014).

Needle	417
Chisel	251
Adze	240
Nail	196
Knife	132
Miscellaneous	123
Band	117
Pin	87
Plaque	76
Bowl	70
Harpoon	67
Axe	64
Awl	47
Dish	46
Bangle	37
Bead	32
Piercer	29
Wire	27
Fishhook	23
Tweezers	18
Blade	12
Ewer	12
Vase	9
Borer	9
Saw	8
Bracelet	7
Disc	6
Drift	6
Ring	5
Jar	5
Lid	3
Statuette	3
Arrowhead	3
Ingot	3
Dagger	3
Spear-head	2
Spatula	2
Pendant	2
Mirror	2
Casing	2
Earing	1
Ferrule	1
Spoon	1
Amulet	1
Necklace	1
Basket	1
Total	2209

Tab. 3 Occurrences of copper objects for each class of object

reigns of Kings Djer and Khasekhemwy represent the peaks for the two first dynasties.

Another aspect of this study is the diversity of the classes of objects. No less than 46 classes have been listed (tab. 3). Within these classes, it is possible to note that goods such as needles, chisels, adze blades, nails, knives, miscellaneous goods (some of these objects are not recognisable due to their state of preservation or do not fit in any of the other classes), and bands each possess over 100 examples. Each class of objects has been categorised into tools, miscellaneous, ornaments, recipients and weapons (chart 1). Here, tools are understood as objects used to modify raw material (such as chisels, adzes, *etc*.) in order to create a new object. Ornaments are understood as objects used as personal decoration (such as rings, beads, *etc*.) or which could be of cultic use (amulet or statuettes). Recipients are meant to hold some substance (liquid or solid, as ewers or dishes). Weapons are understood as being used for acts of violence (arrowheads, daggers). Finally, the miscellaneous category includes all the objects which do not fit into the previous ones. This classification into different categories is made, for practical use, from an etic point of view, which "[is] close or overlaps with the emic categories of the ancient Egyptian culture" (Odler 2016: 13) but organised according to modern standards. For the first part of the study, etic classification is used in order to get a general picture of the copper objects produced during the period under study. Further, the emic classification will be addressed to get a more specific picture, *e.g.* the toolkits that can be determined (as, for example, the representation of wooden boxes containing tools in the tomb of Hesi (Quibell 1913: pl. XVI.12–13). The classification presented here is based upon morphological characteristics of objects that were retrieved in a good state of preservation, allowing a clear identification of the item. Upon examination of the classes of copper objects, we are able to note that tools are the most numerous objects found and would have most likely been the most commonly produced good. This division into classes, and to some extent the category to which they belong to, raises the question of the predominance of tools in general and, more strikingly, in funerary context. As can be seen in chart 2, tools are again the predominant category of objects present in the tombs. Without the help of contemporary texts to give an explanation to such a fact, it can be difficult to give the reasons of such an importance.

An examination of the geographical distribution of copper objects for the First and the Second Dynasties shows that two sites are of interest. The first one is North Saqqara, where the mastabas of the First Dynasty were excavated; the second one is Abydos, more precisely Umm el-Qaab, where for more than a century the tombs of the kings of the First Dynasty and some of the Second Dynasty have been explored. Both sites account for almost 76% of the objects recorded in the database made for the study.

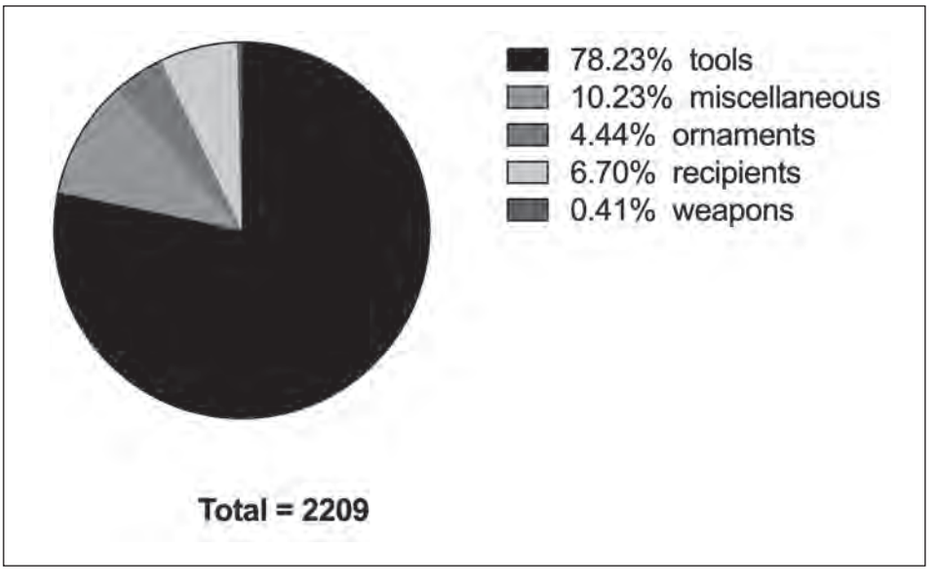


Chart 1 Amounts of the copper classes objects in each category

Definitions

Before going further, three terms which will be employed frequently are to be defined: functional object, miniature, and model. Functional objects, as their name indicates, are items of daily use, which are able to fulfil the function which they were crafted for. Miniatures should be seen as replicas of functional objects, but without a practical use. The most common cases of miniatures are the ceramic or stone recipients. As for models, the definition is slightly more complicated. Swain (1995: 36) suggested that there exist four categories of models:

1. models of objects made to the same size as functional objects but using malleable materials or material available at the time of the crafting of the model, which can be considered as a *replica*;
2. models of objects made to a smaller scale (but Swain does not specify if these are made with the same material as the originals), which here can be considered as a *miniature*;
3. model figures, seen as the prototypes of the ushabtis;
4. materials used as a substitute for expensive items.

The issue with these four categories is that what are called model objects in the present study do not fit into any of them. Indeed, the copper sheets, cut in the shapes of functional objects, are not miniatures: most of the time, these models are the same size as the functional counterparts. Concerning the first category proposed by Swain, the models considered for this study are not replicas made from a material easier to work or available at the time of the crafting; the models of adzes or axes found in the tomb of King Khasekhemwy are made with the same material as the functional objects. The second category, as seen above, can be considered as being miniatures and not models. For the third category, no anthropic figure made of copper has yet been found[7] although a baboon amulet was found by Petrie in Kafr

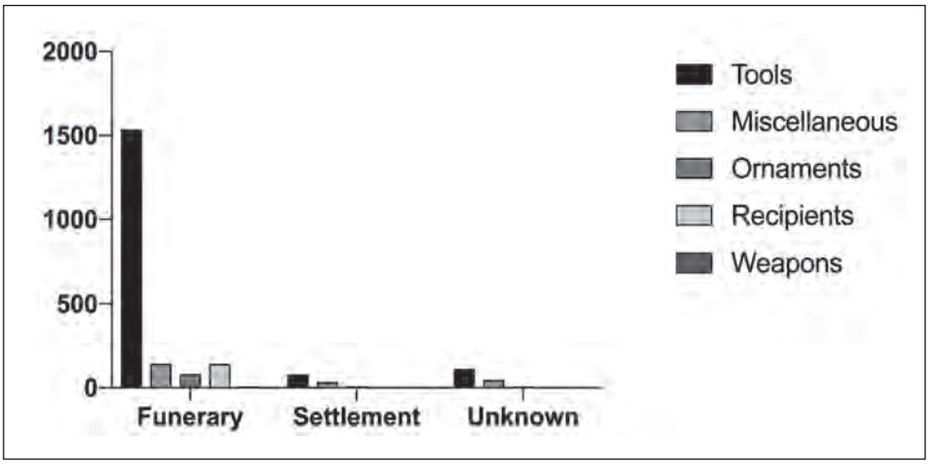


Chart 2 Amounts of the copper objects categories according to the context

[7] Fathi Afifi Badawi (2003) published what he believed to be an anthropoid figure found during the excavations in Maadi in 1984–1986, but it is not convincing.

Tarkhan (Petrie 1914: 9, pl. I, top left; Petrie Museum of Egyptian Archaeology, UC 15271). Finally, the fourth category is not relevant for the present study given that all the models concerned here are made with the same material as the functional objects. Recently, another definition for models, miniatures and miniaturised objects has been proposed for the vessels from the Old Kingdom (Odler 2016: 15–19; Arias Kytnarová *et al.* 2018: 18). Models are understood as containers resembling functional vessels from the outside, often in a stylised manner and can be considered as "dummies". Concerning the miniatures, they are understood as functional vessels but containing only a symbolic fraction of the offerings and do not exactly resemble the functional vessels. As for miniaturised vessels, they are smaller and functional copies of vessels. To sum-up, and to synthesise the proposed definitions by Swain, Arias Kytnarová *et al.*, and Odler, the copper objects found during the First and Second Dynasties can be categorised as follows:

- functional objects: full size and functional;
- models: objects resembling the functional objects but losing their practical aspect (which corresponds to Swain's first category and Arias Kytnarová *et al.* and Odler's first category);
- miniaturised: smaller than functional objects, they keep their functional aspect (which correspond to Swain's second category and Arias Kytnarová *et al.* and Odler's third category);
- model figures (Swain's fourth category): which would include the possible statuette elements as found in Naqada (some bovid horns, Petrie – Quibell 1896: 24; Payne 1993: 14, cat. 7, fig. 3.7 today at the Ashmolean Museum, Oxford, Inv. Nr. 1895.983).

As for this paper, given the data that were gathered for the study of copper objects from the Predynastic and Early Dynastic Periods, it would seem that no miniature copper objects are known for the period under examination: this could be a result of the preservation conditions preventing the recovering of such items, and maybe in the future new findings could change this fact. Nonetheless, if comparing the most remote and recent epochs, a substantial gap can appear concerning the interpretation of the objects, as Odler (2016: 14) well summed it up: "There is a significant difference in the interpretation of miniaturized artefacts between past cultures with and without preserved written sources. With preserved written and iconographic sources, the meaning of artefacts can be inferred from written and iconographic sources. The complex ideas about miniaturized objects cannot be as easily reconstructed by inferences from the archaeological theory in the cases where the written sources and thoughts behind the miniaturized versions of artefacts are less comprehensible and not preserved in texts."

As far as it concerns the First and the Second Dynasties, it seems that copper models made their appearance during the beginning of the Second Dynasty (Köhler 2014: 218, fig. 72, nos. 12–15). Out of 1725 objects accounted for this period, only 164 are to be considered as models, that is to say a very low percentage. Furthermore, their occurrence is mainly attested at the extreme end of the Second Dynasty. Considering the totality of the objects from tomb V at Abydos, 326 objects, the ratio of functional objects to models is almost 1:1, whereas for tomb S3471 at North Saqqara, all the 807 copper objects are functional objects.[8] The question emerging from such a difference in treatment of the copper objects is why, suddenly, do the models seem to be prevalent over the functional objects? In order to deal with this phenomenon, two sites have been chosen for their large corpus of copper objects: Abydos and Saqqara.

Abydos and saqqara

In the year 1895, Émile Amélineau began his work at the site of Umm el-Qaab at Abydos (fig. 4) and made one of the major discoveries of the study of the Early Dynastic Period: the tombs of the kings of the First and Second Dynasties. The second season, of the three years spent on this site (1895–1896, 1896–1897 and 1897–1898; Amélineau 1899a, 1899b, 1902, 1904 and 1905), was dedicated to the exploration of the tomb of King Khasekhemwy. Whilst copper objects were found throughout the tomb (fig. 5a), we should note that a basket filled with "1220 small copper objects" was located in corridor 6 of the "superior part" (Amélineau 1902: 163–6); these were, sadly, impossible to locate entirely.[9] Most of the objects were models, that is to say made from a cut sheet of copper, whereas the rest were actual objects.

When Petrie took over the site of Umm el-Qaab (Petrie 1900, 1901a and 1901b), he re-excavated the tombs and, again in the tomb of King Khasekhemwy, he found a large quantity of copper objects, of which some of them were models located at the entrance of room 21 (fig. 5b) (Petrie 1901a: 28; Petrie 1901b: pl. IXA.4–5). According to Petrie, the total amount of objects he uncovered in that location was 194.[10] Furthermore, both Amélineau and Petrie did find functional copper objects at Umm el-Qaab, both in the tomb of King Khasekhemwy and in other tombs located in the cemetery (for example, Amélineau 1902: 445, pl. XXVI, no. 14; Petrie 1900: 28, pl. XXXVII.37).

[8] We have to mention the copper models supposedly found by Amélineau that are still unaccounted for; thus, the number greatly varies and so does the ratio. Also, as the tomb was disturbed, this is only the current picture we have: as was mentioned above, the results can vary in the future due to further investigations.

[9] Although a MA thesis was published on the objects kept at the Museum of Fine Arts and Natural History of Châteaudun (Dumortier 1984), no mention was made about that discovery, but it seems that six of them are kept at the Royal Museums of Art and History, Brussels (Rademakers *et al.* 2018: 181).

[10] Due to the *partage* practice until 1980, some models were sent outside of Egypt. The author of the present article tried to locate the objects and, to date, has recorded only 156 out of 194 models in his database.

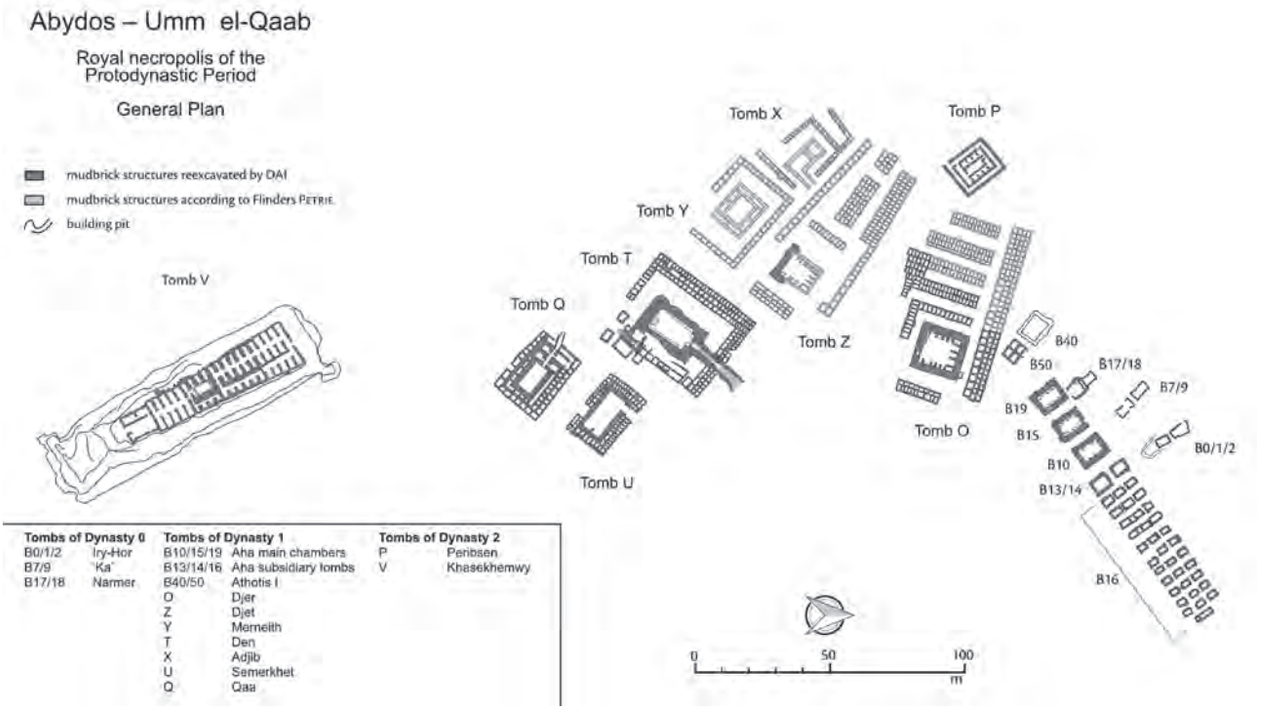


Fig. 4 Umm el-Qaab, the necropolis of the kings of the First and Second Dynasties (after Martin 2011: 15, fig. 2)

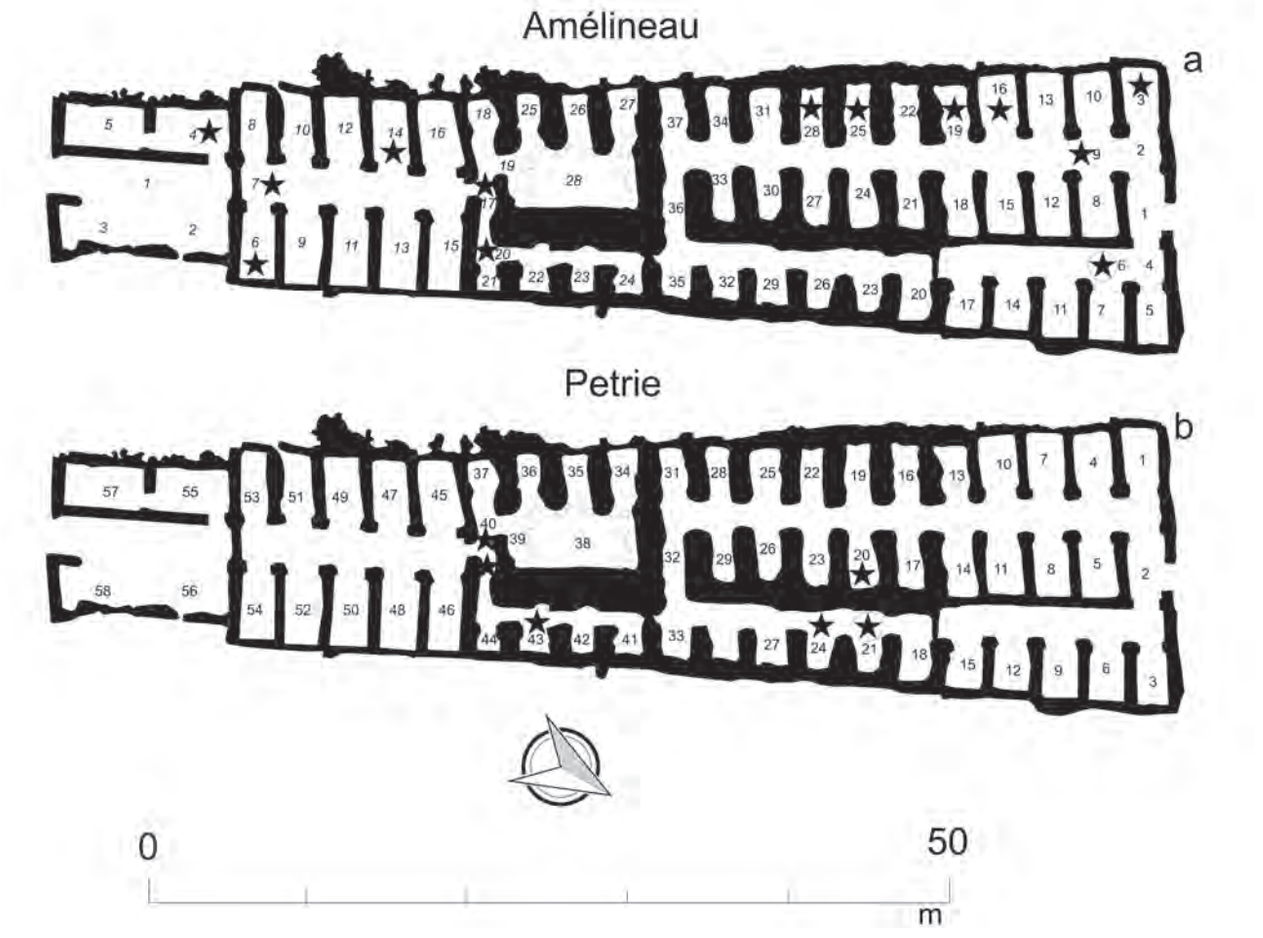


Fig. 5a–b Numbering system of the rooms of the tomb of King Khasekhemwy by Amélineau and Petrie. Circled symbols are the find spots of the copper models (after Martin 2011: 15, fig. 2)

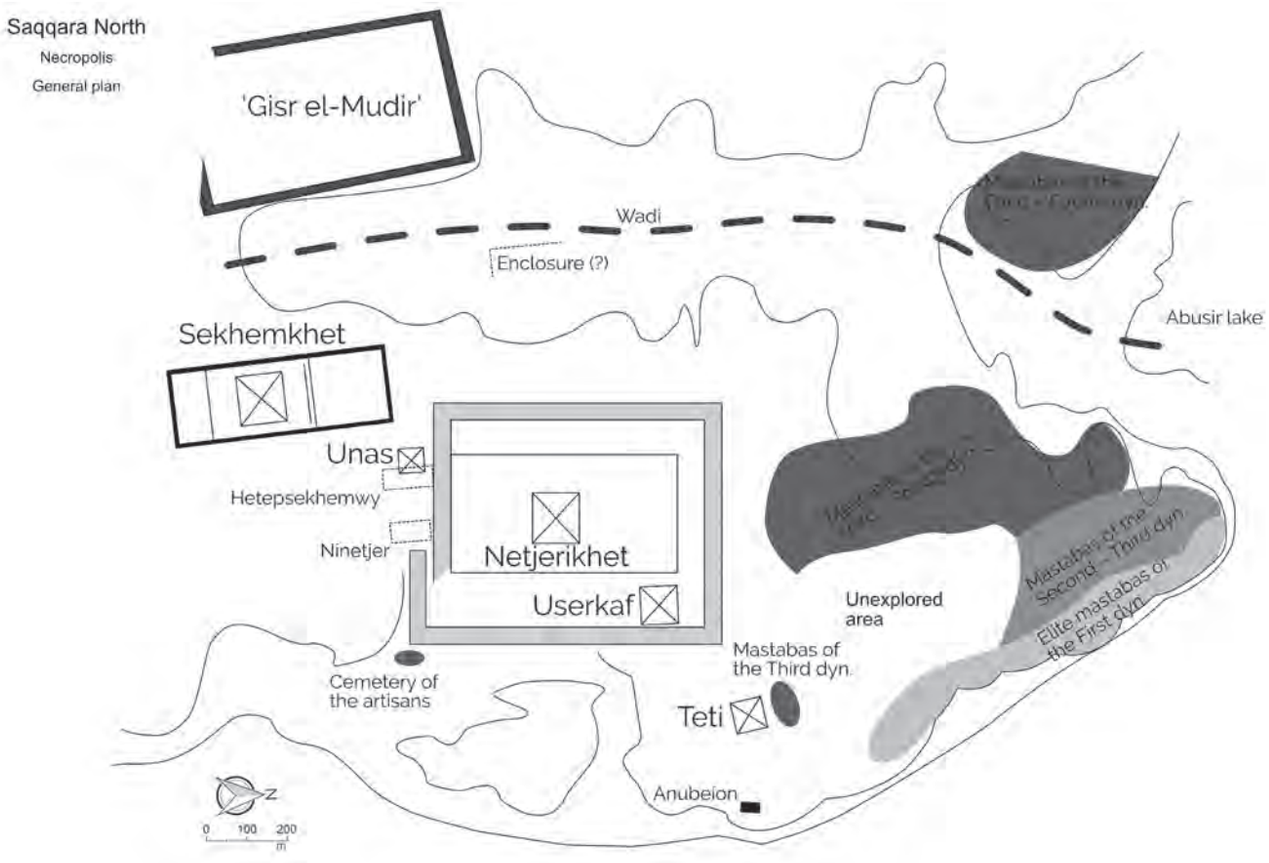


Fig. 6 North Saqqara, situation of the necropolis (after Baud 2007: fig. 54)

Years later, at North Saqqara (fig. 6), Walter Bryan Emery explored a series of mastabas from the First Dynasty (Emery 1938, 1939a, 1939b, 1949, 1954 and 1958). In room S of tomb S3471, he found four wooden boxes (fig. 7) containing 807 functional objects of copper (Emery 1949: 19–57). Along with this hoard of copper, he found in other mastabas objects of copper but in lesser amounts and varieties of classes (for example, in mastaba S3504, 20 objects were found including eight adzes, three bowls, two chisels and miscellaneous objects; Emery 1954: 39–40, 52, 54, 59–63, 66).

The 1970s saw the German Archaeological Institute take over the site at Umm el-Qaab and conduct a third excavation of the tombs of the first dynasties. Additional copper objects were discovered during this excavation, in particular in the tomb of King Qaa, where around 240 objects were found (Engel 2017: 419–421, 477–482, 500–501, 520), adding more occurrences of copper for this period, but as will be seen below, the objects found in the tomb of King Qaa are largely part of what today is considered "ironmongery".

When all 1673 copper objects are examined in terms of their provenance, we are able to note 884 of these are known to come from North Saqqara, with the remaining 789 being found at Abydos. As the work is still in progress in the southern site, it is to be expected that the number will increase in coming years. The majority of the material from Saqqara dates to the reign of King Djer (chart 3a), whereas the goods found at Abydos come primarily from the tombs of King Khasekhemwy and Qaa (chart 3b). The large number of objects found allows for a comparative analysis of the usage of copper between the two dynasties. As said above, some of these objects are functional objects, finished tools or recipients and some others are model objects.

Expeditions, political situation and offering stelae

What reasons could explain the use of models instead of functional objects? Are there any elements, from archaeological contexts or from historical sources, which allow us to address this phenomenon? To answer this question, several elements are to be taken into consideration. The first one relates to the acquisition of the metal. Various expeditions to the Sinai Peninsula occurred during the Early Dynastic Period, with textual information regarding these expeditions from as early as the end of Dynasty 0 (Tallet 2012: 2015). For example, in the Wadi el-Homr, three rock inscriptions were found, one of which details King Den smiting a Bedouin in front of an unknown deity (Rezk Ibrahim – Tallet 2012). There are two prevailing theories regarding the identity of this deity:

1. He may be the god Soped (Godron 1990), well attested in the Sinai Peninsula from the beginning of the Old Kingdom. Just before his head are four hieroglyphs

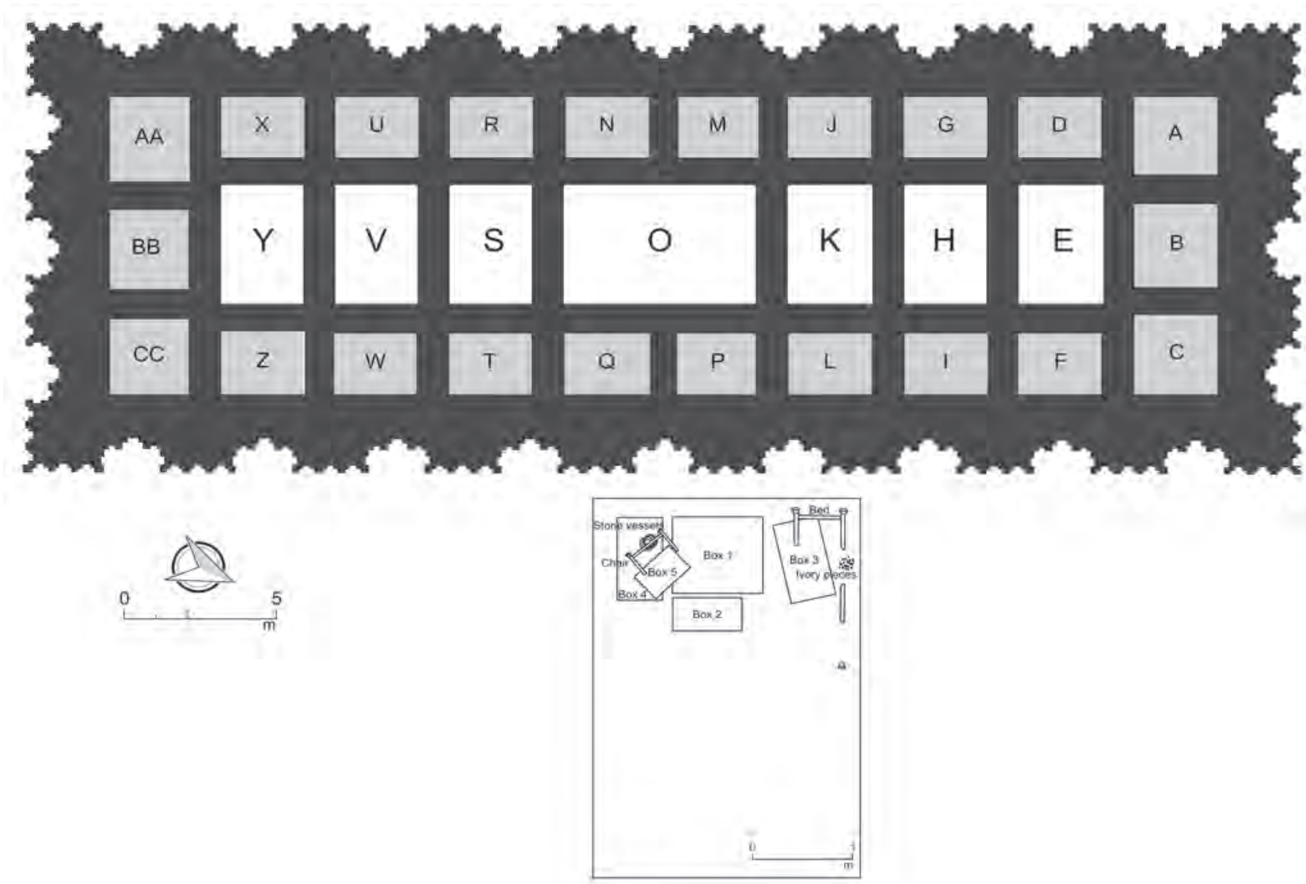


Fig. 7 Plan of Tomb S3471 and Room S, North Saqqara (after Emery 1949: fig. 13 and pl. 2)

interpreted as an aleph (𓄿) or a falcon (𓅃) and a group of three signs which could form the word [hieroglyphs], *fk3t*, turquoise in its most ancient attestation;

2. He may be the god Ash, *3š*, the first sign before the divine figure being a combination of an 𓄿 and a 𓈙.

The presence of Soped or Ash in this inscription is paralleled with two labels from the reign of King Den (Rezk Ibrahim – Tallet 2012: 158–60): the labels Louvre E 25.268 and BM 32.650 where the second register on the right of each shows the god in question. The reading

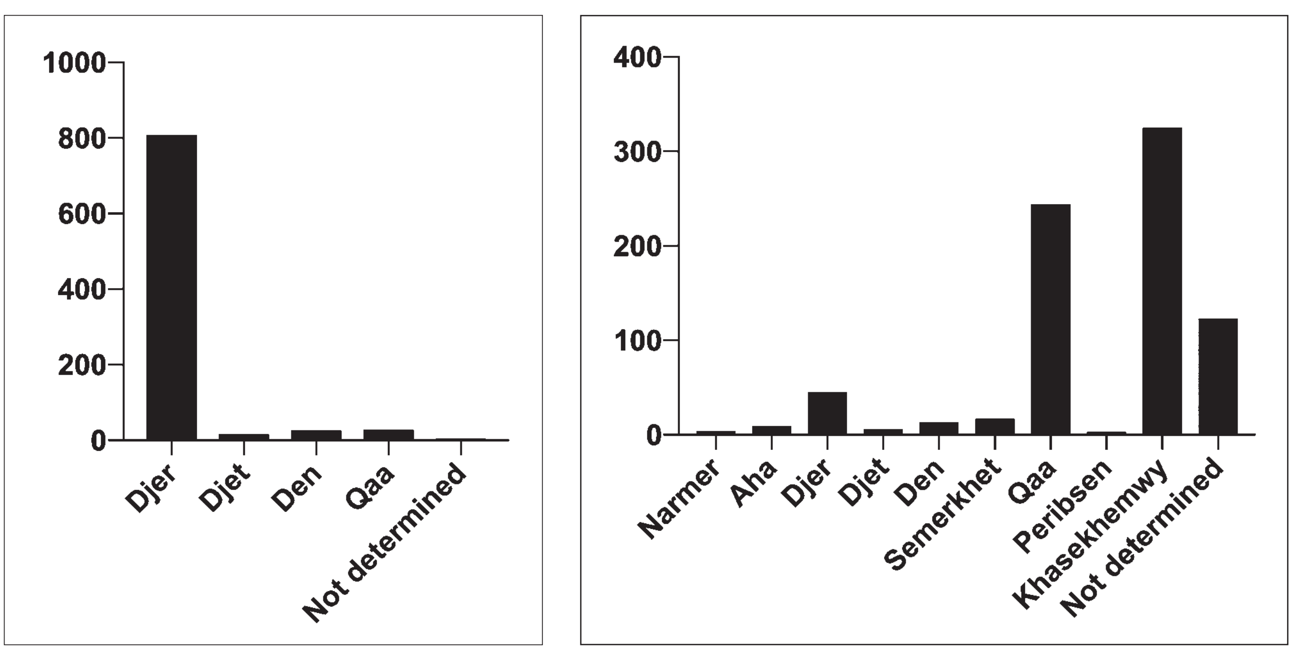


Chart 3 (a) Occurrences of copper objects in North Saqqara for each individual reign; (b) Occurrences of copper objects in Umm el-Qaab for each individual reign

Tab. 4 Total number of inscriptions attested for the First and Second Dynasties in the Sinai

Expedition no.	King	Documents
1	Unknown king, Naqada IIIA2	CCIS 273
		CCIS 274
		CCIS 275
		CCIS 276
2	Unknown king, Naqada IIIA2–B1	CCIS 277
		CCIS 278
		CCIS 279
3	Iry-Hor	CCIS 280
		CCIS 281
		CCIS 282
		CCIS 283
		CCIS 284
		CCIS 285
		CCIS 286
		CCIS 287
		CCIS 288
		CCIS 289
4	Narmer	CCIS 290
		CCIS 291
		CCIS 292
		CCIS 293
		CCIS 294
		CCIS 295
		CCIS 296
		CCIS 297
		CCIS 298
		CCIS 299
		CCIS 300
		CCIS 301
		CCIS 302
		CCIS 303
		CCIS 304
5	Aha?	CCIS 305
6	Djer	CCIS 306
		CCIS 307
		CCIS 308
		CCIS 309
		CCIS 310
		CCIS 311
		CCIS 312
		CCIS 313
		CCIS 314
		CCIS 315
		CCIS 316
		CCIS 317
7	Djet ?	CCIS 323b
8	Den, year 30?	CCIS 1
		CCIS 2
		CCIS 3
		BM 32650
		Louvre E 25268
		OIC 6126
		Ab K 2578
		Palermo Stone r.III
9	Raneb	CCIS 318
		CCIS 319
		CCIS 322
		CCIS 324
		CCIS 325
Total		59

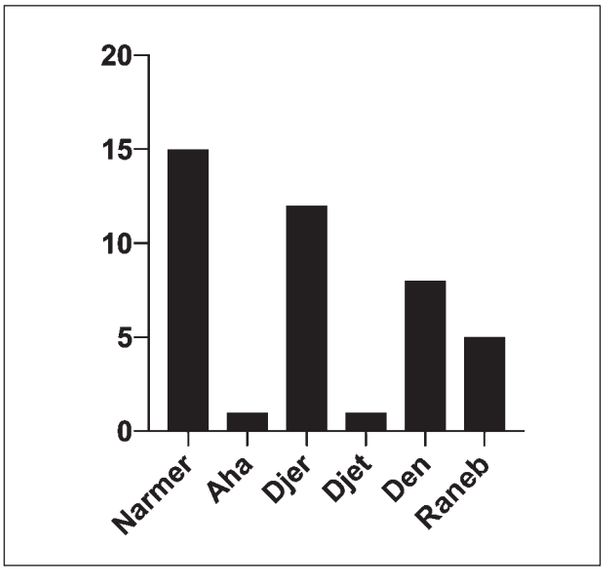


Chart 4 Occurrences of inscriptions attested for the First and Second Dynasties

of the hieroglyphic sequence proves to be a difficult task. Godron (1990: 50–61) proposes the reading *wp bȝ ꜥȝ-ꜥn śqr Jwnwt jnt=s m Śpd ḫnty bjȝ*, "send an expedition (or expeditions). Dismantle the fortress ꜥȝ-ꜥn ("The-Beautiful-Gate"). Smite the *Jwnwt*. Capture them (lit.: bring them) with Soped, who presides over the Mines". As for Rezk Ibrahim and Tallet, they read the first part the same as Godron does, but interpret the second sequence in three different ways:

1. *jnt sšmt*, "bring back malachite";
2. *jnt sšmt <n> Bjȝ*, "bring back malachite from the 'Mining Country'";
3. *jnt sšmt bjȝ*, "bring back malachite and copper".

But another reading of the sequence is possible: *jn*(*t*)*=s m šzmt* (*bjȝ*), *jn*(*t*) *m* being attested as "have recourse to" (Faulkner 1962: 22).[11] So the complete register could be read as: *wp bȝ ꜥȝ-ꜥn śqr Jwnwt jn*(*t*)*=s m šzmt* (*bjȝ*), "send an expedition, dismantle the fortress 'The-Beautiful-Gate', smite the *Jwnwt*, her (of the expedition) bringing back malachite (and copper)". The inscription and the label of King Den provide an insight into the development of the expeditions to the mines, which seems to have been not without obstacles: in both cases, the expedition had to confront local populations in a violent act. On the labels, it suggests even more violence due to the fact that the expedition had to "dismantle" a fortress. This shows us that the acquisition of malachite, be it for cosmetic purposes or to transform it into metal, was a tedious enterprise needing a lot of logistics. Other inscriptions from the southern Sinai well testify to Egyptian expeditions to this land during the Early Dynastic Period. An impressive example is found at the Wadi Ameyra (Tallet 2015): it is a set of inscriptions found on a rocky wall, of which at least 53 can be dated back from Naqada IIIA/B to the Second Dynasty. Although no mining installations have been found nearby, these inscriptions clearly demonstrate the Egyptian presence in the region and their intention to mark the territory. Also, their location could have indicated the entrance to the mining region exploited for its minerals. In total, Tallet (2018: 86–96) counts nine expeditions (tab. 4 and chart 4). As can be seen, Narmer is the king attested in most inscriptions, followed by Djer. If these figures are compared with the distribution of objects by reigns, the inference is totally different. Whereas the first king of the First Dynasty is mentioned in fifteen inscriptions, only four copper objects from his reign have been retrieved, thus far. To the contrary, from the reign of King Djer, twelve inscriptions where found in the Sinai Peninsula and more than eight hundred copper objects were retrieved from his reign. As a matter of fact, it has to be noted that they were not found in his tomb at Umm el-Qaab but in tomb S3471 in North Saqqara. What reason could explain that the king himself was not interred with more objects? The first explanation could be that the tomb was robbed after his burial. The second one could be in relation to the preservation conditions, but as can be seen from the same site, the tombs of King Qaa and Khasekhemwy delivered a great number of such objects. The third reason could be related to the products sought for in the Sinai. It is assumed that the expeditions sent to the peninsula were to acquire malachite *and* copper ore, but as exemplified by the reliefs and etiquettes of King Den, it is not certain that copper ore was particularly sought for. This can explain why it is possible to find numerous inscriptions dating back to certain reigns in the Sinai, but in the end few copper objects in the tombs or other contexts. Why then was a high official of King Djer interred with so many copper items? Without knowing the identity of the owner of the tomb, it is sadly still impossible to say.

Concerning the provenance of the copper ore, various studies have been published recently (Abdel-Motelib *et al.* 2012; Kmošek *et al.* 2018; Rademakers *et al.* 2018). The conclusions of these studies seem to point to a "local" source for the copper found in the context of the Early Dynastic Period. By "local", it is mainly meant the Sinai Peninsula and the Eastern Desert. Concerning the Sinai, as just seen, a set of inscriptions proves the Egyptian presence from the end of the Naqada Period. The study led by Rademakers points towards several potential locations as the sources of the metal ore, such as the Wadi Tar or the Wadi Regeita (Rademakers *et al.* 2018: 181). Kmošek and his team reached the same conclusions (Kmošek et al. 2018: 201). As for the Eastern Desert, the possibility of the copper was sourced in this region is corroborated by the work of the Institut français d'archéologie orientale (IFAO) conducted in the 90s (Castel *et al.* 1998). A sherd with an incised *serekh* was found and could date from Dynasty 0 or the

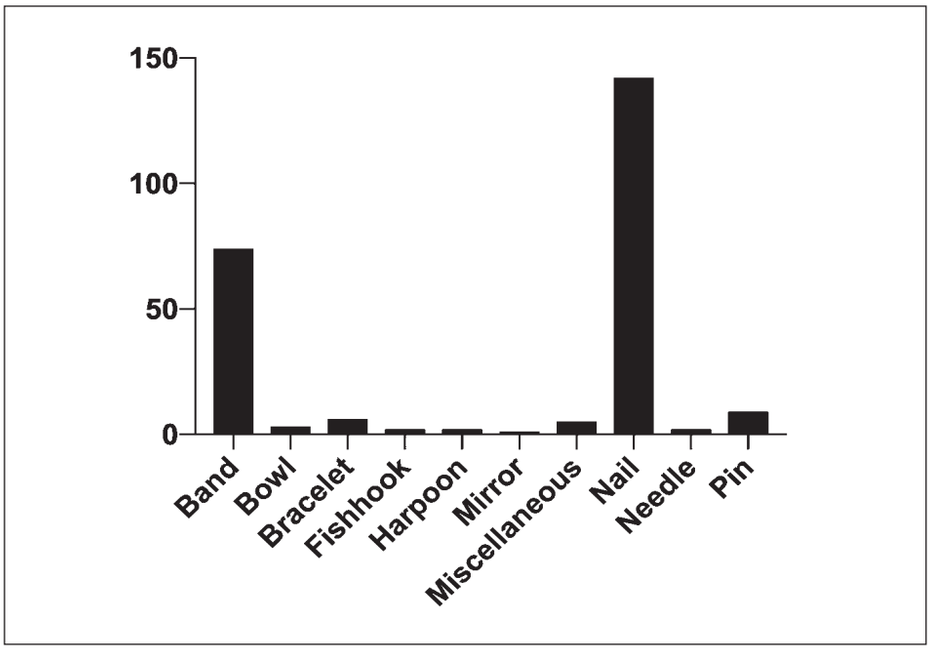
[11] I would like to thank Josep Cervelló Autuori for commenting to me on the existence of such a reading of *jn*(*t*) *m*.

beginning of the First Dynasty (Castel *et al.* 1998: 71). Again, recent lead isotope analysis shows that the Eastern Desert could have been a possible source for the copper ore (Kmošek *et al.* 2018: 200; Rademakers *et al.* 2018: 179–80).

Another look at tab. 4 allows us to emphasise that most of the expeditions, five out of six, were sent during the First Dynasty and only one during the next dynasty, under the reign of King Raneb. Was there a loss of interest in the metal? It does not seem possible considering the three hundred and 25 objects found in the burial of the last king of the Second Dynasty. Then, what could explain such a difference? Maybe it could be useful to take a look at the political situation during the two dynasties. Concerning Narmer, the king is believed to have unified Upper and Lower Egypt during his reign. In this time of unification, it does not seem probable that the dominant class was demanding copper, although the name of the king has been found outside the country, *e.g.* at Tel Erani, Tell Arad or Nahal Tillah in northern Neguev (Wilkinson 1999: 69), which suggests a level of foreign interaction, and even the possibility of trade. Concerning Aha, the events of his reign are not well known, and few attestations of his name have been found outside the Nile Valley (Wilkinson 1999: 71), the inscription of Wadi Ameyra being uncertain (Tallet 2015: 22). The successor of King Aha, Djer, is better known. He seems to have had a long reign, 41 complete or partial years according to the Palermo Stone (PS r.II.3–12, Wilkinson 2000: 79, 92–103). According to the Cairo Fragment (CF r.II.5, Wilkinson 2000: 190), Djer mounted an expedition to *St*, most probably Western Asia or the Sinai Peninsula, a fact which is corroborated by the inscriptions found in the Wadi Ameyra. His reign seems to have been a flourishing period for the country, which gave him the possibility to build an important funerary complex at Umm el-Qaab and a funerary enclosure. The reign of Den, a relatively long period of at least 32 complete or partial years, (PS r.III.1–14, Wilkinson 2000: 79, 103–119) attests one expedition to the Sinai Peninsula. It should also be noted that the reign of King Den coincides with the country experiencing another flourishing period, which is exemplified by the majority of the tombs at North Saqqara being attributed to his reign. The seventh king is known as Semerkhet and his reign seems to have been short. The CF1 mentions the years 1–9 of the king (CF1 r.III.3–11, Wilkinson 2000: 195–200). During his time, relations with the Near East seem to have been maintained but on a smaller scale than his forebearers (Wilkinson 1999: 79–80). Finally, Qaa is the last king of the First Dynasty. He seems to have benefited from a rather long reign attested by the numerous mastabas at North Saqqara despite the fact that the CF1 only registers two years of his reign (CF1 r.III.12–13, Wilkinson 2000: 201–202). Contacts with Western Asia seem to have continued during his reign (Wilkinson 1999: 80–81) as well as the acquisition of the metal ore.

This short summary of the events of the First Dynasty serves to show that even though it was the beginning of the kingship and the development of the state apparatus, no particular event seems to have perturbed the continuity of the eight kings of the dynasty. Short reigns may have different causes, but internal instability may be ruled out. This period saw great development in numerous areas such as architecture and craftsmanship as exemplified by the copper objects found in mastaba S3471 or even the vessels found in the tomb of King Qaa (Ab 1646, Ab K 1647 and Ab K 1648, Engel 2017: 419–421, fig. 264). Another clue to the prosperity of the dynasty is the different expeditions which were sent to the Sinai Peninsula. Out of eight kings, five kings (Narmer, Aha, Djer, Djet, and Den) sent expeditions to

Chart 5 Amounts of the copper objects according to class found in the tomb of Qaa at Umm el-Qaab



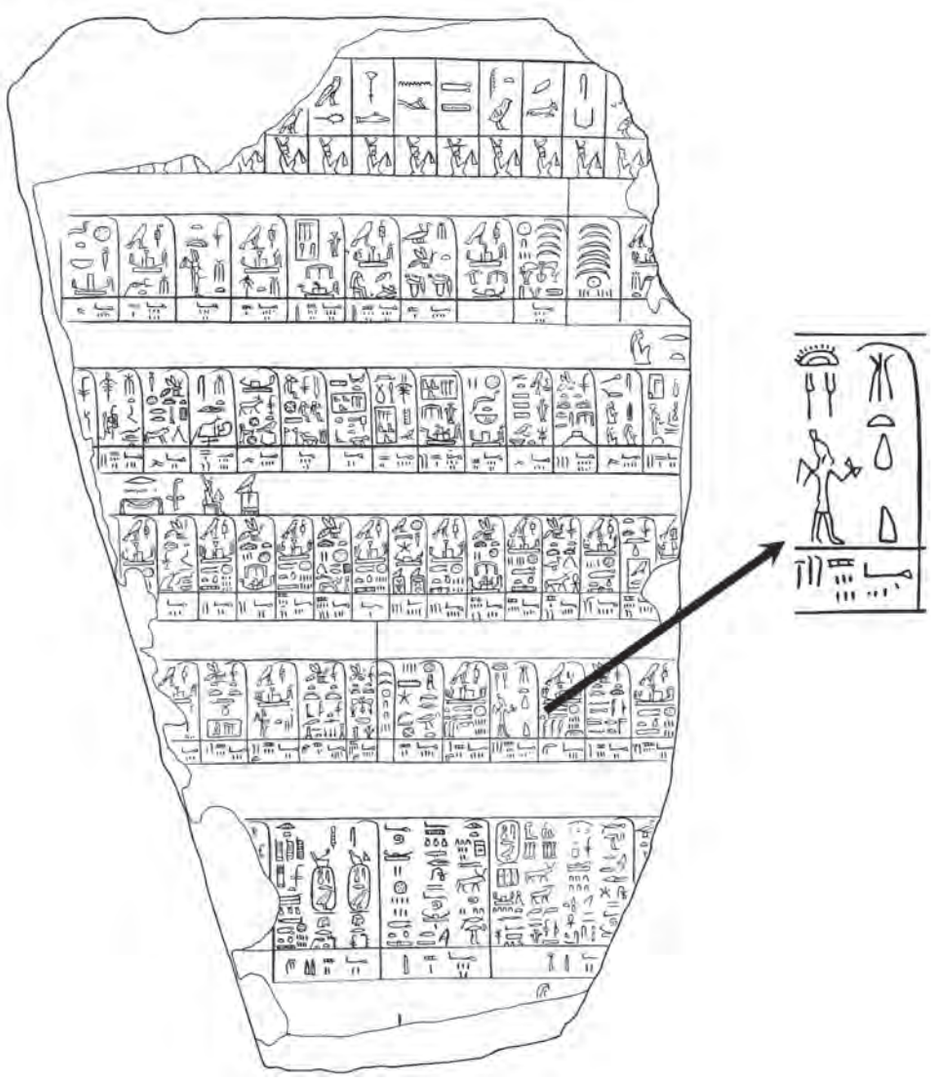


Fig. 8 Palermo Stone and a detail of r.V.4 (after Wilkinson 2000: fig. 1)

the mining region, sometimes needing military actions but always resulting, it seems, in an Egyptian victory, which enabled the exploitation of the natural resources of the region. The peak of the production of copper objects is undeniably the reign of King Djer followed by Qaa. Regardless of the high number of copper objects found in the tomb of the last king of the dynasty, it is noteworthy to say that more than half of the material is made up of nails (chart 5), which moderates the quantity of metal found in the burial place of King Qaa; to the contrary, the objects dating to the reign of King Djer are massive functional objects which represent an important weight of metal.[12] As seen before, the number of objects found in mastaba S3471 was not equalled later, nor the variety of classes of objects.

The archaeological panorama presented by the Second Dynasty is quite different. The lack of information that we possess means that much of this period still remains unclear. It seems that under the rule of King Raneb, two expeditions were carried out outside the Nile Valley, maybe three (Hamilton 2016: 186): the first one is attested by a rock-cut inscription found near Armant by Hans Alexander Winkler (1938: 10, pl. XI.4) and the other in the Wadi Ameyra by Pierre Tallet (2015: 33, pl. 41). The last king of the Second Dynasty is by far the most well attested ruler of this period. Khasekhemwy is most widely attested, from Nubia to Lebanon, and a sealing bearing the title *jmj-rꜣ ḫꜣst*, "overseer of foreign land(s)" may testify to a renewal of the relations between Egypt and its neighbours, along with its hegemony. Regarding his final resting place, tomb V at Umm el-Qaab is one of the most impressive monuments of the area and his funeral enclosure at Abydos, Shunet ez-Zebib, next to which were buried several boats, is even more impressive. Furthermore, at Hierakonpolis, a similar building known as the "Fort"

[12] It is impossible to be more precise on the subject of the weight of the objects. Indeed, if the dimensions of the objects are not always given, in very few occasions is the weight published. This lack of information prevents a better study of the objects and the possibility to establish, maybe, a line differentiating functional objects from models.

parallels Shunet ez-Zebib (Wilkinson 1999: 92–93). On the Palermo Stone, one entry is of interest concerning the reign of Khaskhemwy. This entry is found at PS r.V.4 (fig. 8) which reads *mst ḥmt(?) q(ȝj)-Ḥʿ-sḫmwy* and translated by Wilkinson "creating the copper (statue) 'high is Khasekhemwy'" (Wilkinson 2000: 133), but the use of the word "create" for *mst* does not fit well. Instead, "giving birth" would better fit the fact that this is a copper statue. This detail will be dealt with more extensively below, but it is noteworthy to say that this is the first reference to copper statuary. Two other similar statues are well known from a later period: the copper statues of Pepy I and Merenre.[13]

From this very brief summary of the Second Dynasty, the main element to be emphasised is that after a relatively peaceful beginning, the internal situation began to deteriorate at the end of the reign of King Ninetjer, who was succeeded by three ephemeral kings and then King Peribsen/Sekhemib-Perenmaat, who decided to be buried back at Umm el-Qaab. It seems that he only ruled in the southern part of the country and that his successor, Sekhemib, might have been the same person. Finally, with the reign of Khasekhem(wy) the situation appeared to get better. Indeed, after a victory against a northern enemy, he modified his name, and the different monuments he left only testify to an era of prosperity. Also, comparing the number of objects found for each reign to the internal situation of Egypt, almost no copper objects were found until the end of the dynasty. Internal difficulties may have prevented the central power from getting access to the necessary resources, but as seen for the reign of Raneb, it seems that foreign relations did not stop. What could have changed is the procurement ability of the monarchs. Indeed, even if there were difficulties impeding the sending of expeditions to get mineral resources in the Sinai Peninsula, that does not mean that lesser exchanges with Western Asia did not occur. With the reign of King Khasekhemwy it seems that the commercial exchanges resumed, and the procurement of the metal ore was made easier. Nonetheless, as mentioned before, half of the objects found in the tomb of the last king were models. This fact raises the question of why the material found was not completely made up either of functional objects or completely of models.

To attempt to answer this question, it is possible to evoke two hypotheses which are not mutually exclusive. As a preliminary statement, it is necessary to remember that the study of the copper objects can take two directions: a cultic or symbolic one, or an economic one (Wilde – Bárta cited in Odler 2016: 12). Although the two points of view seem rather different from each other, they are not necessarily incompatible. The first reason, then, is related to the internal situation of the country during the first part of the reign of King Khasekhemewy. As mentioned above, he had to face some northern enemy and seemed to only have a hold on the south of the valley. This would result in a decrease in the commercial relations with Western Asia and by that way a greater difficulty to obtain copper. To resolve the problem of copper acquisition, two options are conceivable. The first one would be the reuse of existing objects, even their recycling to make new ones (Rademakers *et al.* 2018: 188). It is possible that under Khasekhemwy, known tombs or warehouses containing objects made of this metal were emptied and the copper melted into new objects (Kmošek *et al.* 2018: 201). But facing the scarcity of raw material, instead of making functional objects, the decision was taken to create models. An indication of that practice would be the amount of arsenic found in the models as is the case for some objects dated to the Old Kingdom (Odler 2016: 15; Odler *et al.* 2018: 446): for their making, scraps of copper were used or already existing objects were recycled. If the deposit of copper objects into the tombs was symbolic, then the use of models in these troubled times would not have been any problem. They would serve, *in fine*, the same purpose in the afterlife. The use of models also creates an illusion effect. Indeed, if there was not enough raw material to make functional objects, using models to reach a certain number of artefacts would do the trick by creating an optical illusion of a mass of objects. During the second part of his reign, as the situation in the valley seemed to improve, King Khasekhemwy was able to again have access to raw material sources, including copper. That could explain why the other half of the objects found in his tomb are functional objects and not models. Furthermore, as reminded above, the Palermo Stone registered the crafting of a statue of the king entirely made of copper, which would need a certain quantity of metal, even if the statue was composed of metal plates as is the case with the statues of King Pepi I and Merenre.

Another explanation of the use of copper models could be paralleled with the use of offering stelae. Wilkinson says about the source material and the study of administration: "The practice of furnishing burials with large numbers of sealed commodities seems to have died out early in the Third Dynasty. Instead, a tomb was provided with an offering stela depicting the items considered necessary to sustain the deceased in the afterlife." (Wilkinson 1999: 111).

Regarding the date of the use of offering stelae, a look at the examples published from Helwan shows clearly that this custom had already begun in the mid-late part of the First Dynasty (Köhler – Jones 2009: 56). In the case of these stelae, the offerings represented on them consist of nine categories: bread and baked goods, fruit and agricultural produce, meat and fowls, beverages, oils and fats, incense and purification products, vessels and containers, utilitarian objects, textiles and clothing. According to the authors, the list of the offerings was not fixed and seems to have been at the convenience of the owner of the tomb (Köhler – Jones 2009: 52).

[13] Both statues are in the Museum of Egyptian Antiquities, Cairo, under the numbers JE 33034 and 33035. The statue of Pepy I can be considered a life-sized statue (1.77 m), whereas the other one is much smaller (0.65 m).

In the case of the copper models appearing during the Second Dynasty, what if, only in this particular case, these models were a prefiguration of these items which appeared later in the offering lists? As said above, the models could have been made because of a lack of raw material, but they would, in all cases, fulfil their symbolic function. The same happens with the offerings listed on the stelae: by their pictographic presence they magically fulfil their function of providing the deceased with what he needs in the afterlife. The difference between copper objects and other goods would be the function of the models. In order to explain this difference, a look at the very nature of the metal must be taken. Copper exists naturally in two forms: a native state and as a mineral. In its native state, the colour of the metal ranges from yellowish–orange to sometimes red. As a mineral, the most frequent colour is greenish. Recently, it has been suggested that the making of the copper alloys was dependant on the colour perceived by the metallurgists (Mödlinger *et al.* 2017). Knowing the colour of the metal, this perception of copper might have helped the metallurgists in the choosing of the mineral or in the type of alloy they were going to make in order to obtain a certain colour of metallic copper alloy. The authors have established six types of copper alloys reflecting their colour, ranging from Type I red copper (for 1–5% Sn, 1–3% As, Ni, Sb, Ag), to Type II orange copper (3–7% As, Ni, Sb, Ag) or Type III yellow (5–12% Sn) to finally reach Type VI silver (> 20% Sn), also taking into account the physical and mechanical properties of the alloys (Mödlinger *et al.* 2017: 22). These groups help to determine the original colour of the artefacts when these have been chemically analysed. Concerning the objects from the Early Dynastic, they mainly belong to Type I and II. For example, the model axe blade from the Egyptian Museum of Leipzig (ÄMUL 2212, Kmošek *et al.* 2018: 199, Tab. 4) contains 1.860% of As in its chemical composition, which places it into Type I, red copper, of which the colour ranges from red-pink to brownish-orange. The vessel from the RMAH (E 00561, Rademakers *et al.* 2018: OSM Tab. 2) contains a concentration of a little more than 3% of As placing it into Type II, orange copper, of which the colour is orange-brown-golden. The material found in funerary contexts seems then to range in colour from pink-red to orange-brown-golden. Concerning this last colour, it is worth mentioning that it approaches the colour of gold. As Sydney Aufrère (1991a: 311) reminds us about the constitution of the deities, Re is considered in some cases to have gold limbs, or Amun-Re to have a skin made of gold. This view would give a new meaning to the presence of copper in funerary contexts: being close, at least visually, to gold, copper would transmute the deceased into a divine being in the afterlife.

After being placed into a tomb, the life cycle of copper metal is particular. Recently deposited and having a yellowish–orange colour, with time the objects acquire a green colour due to the oxidation process (although some examples do not show or have very little traces of oxidation). Then, the concept of this changing of state is of utmost importance. Along with copper, in some cases malachite was found in the tombs. It is generally accepted that the presence of this mineral goes hand in hand with the occurrence of cosmetic palettes (for example, Tarkhan graves 749, 795, 829, 976, 1124, 1520, 1522, 1777 and 1891 [Petrie 1914]) but not exclusively (Tarkhan graves 609, 611, 752, 895, 1170, 1232, 1302, 1310, 1575, 1594, 1694, 1698 and 1774 [Petrie 1914]). Nevertheless, another explanation can be proposed, not necessarily exclusive. In later times, during the Old Kingdom, an interesting spell of the Pyramid Texts says: *"Oh, great striding goddess, who strews the green, malachite, and the turquoise of the stars! As you are fresh, I am fresh, and the live foxtail-rush is fresh."* (PT 350, 567a–c; Allen 2015)

In this spell, it is clear that the malachite is evoked for its green colour and by the action of the goddess strewing it, it helps the deceased to be "fresh" or "green", in other words, to be reborn. It seems that in this particular passage, the word fresh is used for its close proximity with the name of the colour (Erman – Grapow 1926: 264, no. 14, 265, no. 15): *w3d*. Then, why use the mineral or the metal in the funerary context? Also, Aufrère (1991b: 541) points out that in PT 248, the goddess Shezmetet (*Šzmtt*) from *Šzmt* gives birth to King Unas: *"Unis is a great one: Unis has emerged from the Ennead's thighs. Unis has been conceived by Sekhmet, and Shezmetet is the one who gave birth to Unis, a star with sharp front and extensive goings, who fetches what the above has for the Sun every day. Unis has come to his seat with the Two Ladies on it, appearing as a star."*

From this recitation the link between the goddess, the mineral and the rebirth of the deceased is clear, and it would not be pure coincidence that an analogy between the use of copper or its mineral can be connected with the vegetal cycle. Indeed, it has to be remembered that ancient Egypt was mainly an agricultural society and that part of its thinking revolved around the vegetal cycle. When a seed is planted, it grows into a plant which later flourishes and produces more seeds, which, when the plant dies, go back into the ground to finally grow back again helped by the decomposing of the parent plant. The same happens with copper. When deposited in the tomb, it is like a seed which will grow and help the deceased to be reborn by taking on its green colour due to the oxidation. The end result of the process, the total oxidation and the disintegration of the object (in some cases) can be paralleled with the returning of the new seeds to the ground and the beginning of a new cycle. This analogy between the vegetal cycle and the copper corrosion cycle could help us to understand why under the reign of King Khasekhemwy a statue of the monarch was made of this material.

To come back to the subject of the models and their lack of appearance on the offering stelae, their very function may be the reason why they are absent from these offering lists. Kuhn (2011: 126–129) argues that this is because of the number of tombs containing models

Adze	10
Axe	16
Chisel	70
Dagger	1
Dish	11
Drift	1
Harpoon	37
Miscellaneous	2
Needle	4
Pin	3
Saw	1
Total	156

Tab. 5 Frequency of the classes of objects amongst the copper models

and the total number of tombs found for the Predynastic and Early Dynastic Period: tombs containing models are few,[14] which can be a reason. However, in his study, he does not consider the function of the objects represented by the models. A closer look at the classes of models is given in tab. 5: these are mostly tools which are used to create new objects. By making them in copper, they may pass onto the items being created all the faculties of the life cycle as explained above: they literally give life to the crafted object. This could be the reason why they are not included on the offering stelae: tools are used in an act of creation, of giving life to inert raw material. It is no wonder that in later times the god Khnum, a demiurge, is represented as a potter or even Ptah, protector of the craftsmen. Then, the models were deposited in the tomb to magically help the deceased recreate the divine act of creation in the afterlife, imitating the demiurge, being himself considered as a deified entity. With time, these objects began to appear on the lists (Köhler – Jones 2009: 148, stela EM99-13 where eleven objects are listed) or even directly on the wall of the tomb as, for example, the tomb of Hesi (Quibell 1913: 8, pl. XVI.12), where they are grouped into "toolkits" representing the tools needed for the act of creation. The grouping of the models into toolkits can be seen as an emic classification. In the case of the objects represented in the tomb of Hesi, the toolkit comprises several axes and chisels, which allows us to categorise them together (Odler 2016: 1), all used to work wood (as for shipbuilding or sculpture) or soft stones.

Another aspect developed over time on the offering stelae is the presence of the sign for copper. Herslund (2015: 111–112) presents several monuments bearing the drop-shaped sign for copper or what could be associated with it. In that case, the copper objects themselves are not represented, but an earlier stage of their creation process. Indeed, Herslund (2015: 114–118) shows that this particular sign is a representation of the furnace installation with its packing of charcoal. This depiction indicates the stage when the copper is being separated from its gangue and melted down to be shaped into an object. Why then represent metallurgical scenes or what could be associated with them in the tomb? Here too, this relates to the act of creation. In his study on the mineral thought, Aufrère (1991a: 65–68) recalls that two terms for designating a mine are *štȝw*, rather a late word but which can be linked to *štȝt*, the matrix or the womb of the mother. Likewise, *ḫȝt*, mine, could be linked to *ḫt*, the body or to *mḫt*<*jmj-ḫt*, the entrails or the uterus/matrix. Further, he argues that mining is to be compared to an abortion of nature (Aufrère 1991a: 318) in order to continue the natural cycle, as is argued by Eliade (1977: 34–49). Miners and metallurgists are substitutes for nature and achieve the maturing of the minerals, using the furnaces as a new matrix/womb in order to give birth to the metal. The close resemblance between the terms mine and womb, and the idea that the minerals have to achieve their maturation through human intervention testify to the connection between mining and forging and the natural cycle of life. By having such representations on the stelae, the deceased assure themselves of a rebirth in the afterlife, following not only a vegetal cycle as commented above, but also by helping the act of creation. This is why the vegetal cycle and the metallurgical process can be, in a way, linked together.

Conclusion

The copper objects in ancient Egypt can be traced back to the Badarian period, but it is not before the rise of the state that this metal began to take on some great importance, whether it was for the development of the craftsmanship techniques or for various symbolic aspects. It is possible to see that during the First Dynasty the kings of that time were seeking this material, thanks to the different inscriptions they left in the Sinai Peninsula. At that time, the middle of the dynasty, the use and the work of copper reached its culmination, as shown by the eight hundred objects found in tomb S3471 at North Saqqara. With the end of the First and the beginning of the Second Dynasty, it seems that the use of the metal decreased drastically. A reason for this which can be surmised is internal unrest and difficulties running almost through the entire dynasty. Relations with Western Asia were occurring on a smaller scale than during the previous dynasty. It is only with the last king, Khasekhemwy, that copper reappears in the funerary material.

Nevertheless, if compared, the objects from both dynasties present a great difference: they pass from being functional objects to models. This change of state is possibly due to the difficulty of acquiring the raw materials. Whilst during the First Dynasty it was

[14] In his argumentation, Kuhn seems to consider miniatures as models.

possible to get enough raw material to create real objects, during the Second Dynasty we see a decline in the mentioning of expeditions to the north to obtain these raw materials. This would have greatly contributed to the decision to recycle the already made objects. Another method of providing higher numbers of copper objects with minimal raw materials would have been the production of goods by cutting them from copper sheets. This method of production accounts for half the objects found in the tomb of Khasekhemwy.

In addition to this, when we examine the potential symbolic nature of the copper objects, we can gain insight into their potential exclusion from the offering lists, as clearly, they were not excluded based on the rarity of the raw material. It is possible to put in parallel the cycle of acquisition – use – decay of the copper objects with the vegetal cycle. By this analogy, copper objects acquire a magical purpose which would subsequently provide the deceased with useful items in the afterlife. More than that, the great majority of the copper objects found in tombs across all periods are tools. By using these copper tools in the afterlife, the deceased is emulating the creating gesture of the demiurge. This is why, for a brief period of time, copper objects are not included on the offering stelae and later in the offering lists. Nonetheless, from the Third Dynasty onwards, such objects made their appearance in the iconographic program of the tomb.

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